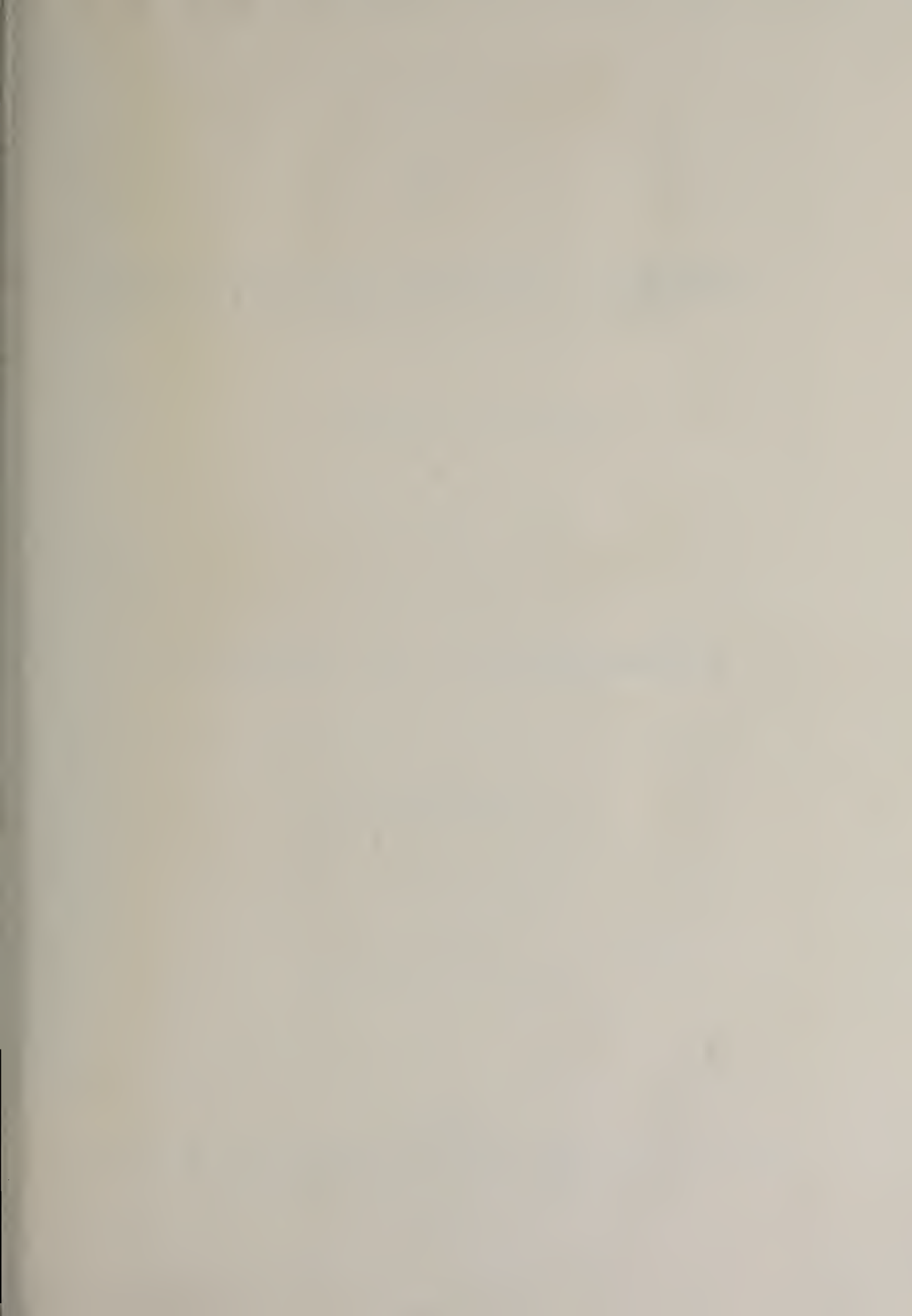
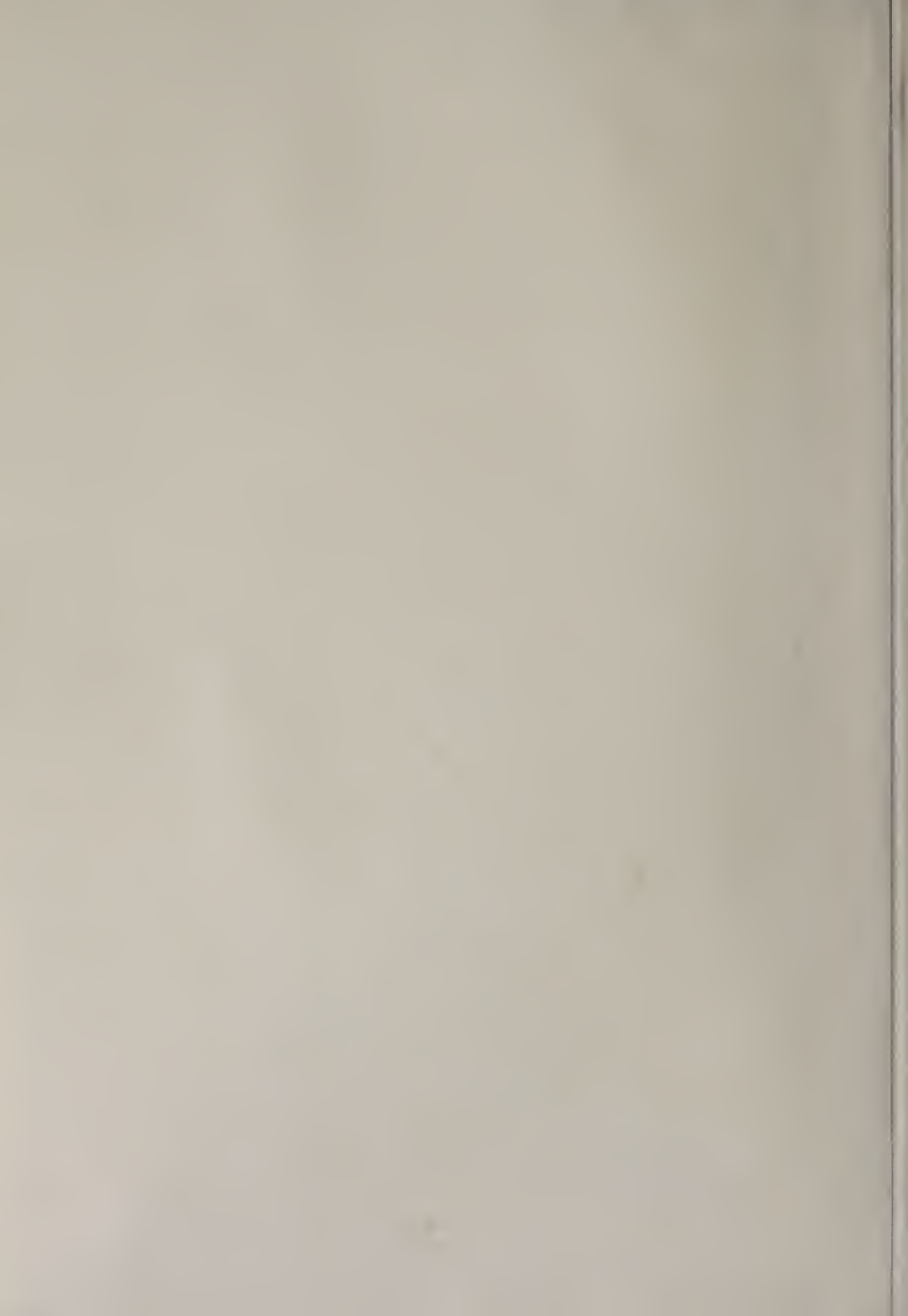




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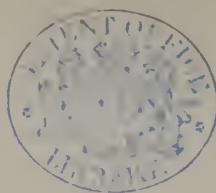
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### PHOTOGRAPHY IN 1887.

ACTIVITY during the past year has been largely exercised in the direction of isochromatic photography—not, indeed, that any new methods of importance have been initiated; but much detailed work has been done—and isochromatic plates are in daily use at most of the large establishments where copying is a principal part of the work.

In connection with platinotype printing, notable progress is to be recorded in connection with the printing out method of Pizzighelli described on p. 179 of our last volume, but the method is made far more practicable and useful for the photographer by the modifications in the process detailed below. Indeed, it seems not unlikely that the labours of Pizzighelli will effect a revolution in platinotype printing.

Dr. Carey Lea's investigations as to the "Photo-salts of Silver" will be remembered by our readers, and apart from a possible practical bearing, they undoubtedly have very great theoretical interest.

The price of magnesium having been reduced from twelve shillings to half-a-crown an ounce, this material has been largely experimented with as a means of producing an illumination for portraiture, and the outcome has been a highly convenient flash light, by which portraits can be taken in so short a time that the patient has actually no time to move till the exposure is over. Magnesium dust, sprinkled on gun-cotton and lighted, gives us the flash light in perfection, and the photographic world is much indebted to Dr. Piffard for his introduction of this light to the notice of photographers.

The amateur artist has had his labour much lightened by the introduction of the American stripping film manufactured by the Eastman Company; while the outdoor professional portraitist can now use gelatino-bromide on his ferrotype plates; and in alluding to this fact in the "Annals" of the YEAR-BOOK, we touch sufficiently on the main points to be attended to in this matter to enable any photographer to prepare ferrotype plates with gelatino-bromide.

Several other points of special interest, relative to the past year's work, are treated of in the introductory chapter of the YEAR-BOOK; hence, we need not say more now as to photographic progress in 1887; but may express a hope that the present year may be still more fruitful in useful results.

### PIZZIGHELLI'S DIRECT PLATINOTYPE PROCESS.

THE importance of the modifications of Pizzighelli's direct platinotype process now described will be understood when we mention that the old iron solution—so different and

troublesome to prepare—is no longer used, its place being taken by a double oxalate of sodium and iron (sodium-ferric oxalate) which is made commercially by the well-known firm Schuchardt, of Gorlitz, and which salt can no doubt be obtained from Hopkin and Williams, or Burgoyne and Company.

Captain Pizzighelli says:—In relation to my recent memoir (see page 725 of our last volume) on the Direct Platinotype Process, I remarked that in all probability some of the definite double salts of ferric-oxalate might be employed, and since that time I have continued my experiments in this direction not only with double salts prepared by myself, but also with samples obtained from the firm of Schuchardt, in Gorlitz. The result must be considered as very satisfactory, and, as far as simplicity goes, the method leaves nothing to be desired.

Of the double salts experimented with, the sodium-ferric oxalate proved the most satisfactory, the corresponding potassium salt giving less sensitiveness; while the ammonium salt, although giving greater sensitiveness, gives less brilliant images than the sodium salt, and, moreover, images having a tendency to a cold, bluish tone. Still, for very hard negatives, and in the reproduction of pencil drawings, the ammonium salt may, perhaps, occasionally be used with advantage.

In the preparation of the sensitive paper considerable variation is allowable, and the following three methods give results which are nearly identical:—

#### First Method.

Arrowroot paste is prepared with one part of arrowroot and ten parts of water, and when this is cold, it is applied to the paper with a sponge—one sheet requiring from fifteen to twenty grammes of the paste. When the paste has been well distributed with the sponge, it is equalised and smoothed with a badger softener, and the sheet is hung up to dry. After the drying the process is repeated, and the sheet is again dried. Coating it smoothly, a sheet takes about five minutes. The arrowroot paper can be stored for use in a dry place when it is sensitized with a preparation made in the manner about to be described.

Four solutions are required—A, B, C, and D.

A.—Chloro-platinite of potassium...	1 part
Distilled water ... ..	6 parts
B.—Sodium-ferric oxalate ... ..	40 parts
Sodium oxalate solution (3 per cent.)	100 ..
Glycerine* ... ..	3 ..

In preparing the solution B, the sodium oxalate solution is warmed to about 40° or 50° C., and then the sodium-

\* The addition of glycerine to this and the following solutions is only necessary in very dry weather.

ferric oxalate is dissolved in it. On cooling a little saline matter separates, so filtration is necessary.

C.—Solution B... .. 100 parts  
Potassium chlorate ... .. 0.4 part

D.—Mercuric chloride solution (5 per cent.) 20 parts  
Sodium oxalate solution (3 per cent.)... 40 „  
Glycerine... .. 1.8 part

For sensitising a sheet (demy size) when black tones are desirable, we must take :—

Solution A	...	...	...	5 cubic centimetres
Solution B	...	...	...	6 „ „
Solution C	...	...	...	2 „ „

For hard negatives the quantity of solution C must be diminished, and B must be increased to the same extent ; whereas for specially soft negatives the reverse holds good.

For brown images the following is used :—

Solution A	...	...	...	5 cubic centimetres
Solution C	...	...	...	4 „ „
Solution D	...	...	...	4 „ „

The above sensitising solution gives a sepia brown tone, and intermediate tints can be obtained by increasing the proportion of C, and correspondingly diminishing D.

The application of the sensitising solution to the paper is effected by means of a suitable brush (not tin mounted) followed by the use of the softener, as before. The sheet is then dried at about 30° or 40° C.

(To be continued.)

## PHOTOGRAPHY AND THE PHONOGRAPH.

NEWSPAPER readers have been entertained of late with accounts of recent great improvements made in the phonograph by Edison—improvements which, it is said, will enable business men to dispense with shorthand writers and copying clerks. These notices have brought into prominent notice some other variations and improvements of the phonograph, and more especially one in which the direct phonogram is a traced negative on glass, this negative being used as an original in the production of a photo-relief, which functionates as the pattern from which the receiving diaphragm is made to move. The earlier efforts in this direction by Cros and others have been referred to in the PHOTOGRAPHIC NEWS, and the following description of the latest and apparently the most perfect instrument of the kind—the Gramophone of Berliner—we take from our contemporary, *Industries* :—

Berliner's instrument consists of a mechanism capable of rotating a circular disc of plate-glass about  $\frac{7}{8}$  in. thick and 11 in. in diam., and at the same time arranged to give the disc a progressive movement, in accordance with a screw passing through the standard supporting the disc. In the reproduction of sound, the glass disc is supplanted by one of metal or other resisting material, in which the sound record appears as a groove of even depth but varying direction.

To trace a phonautogram negative, the glass disc is laid on a level block, and printer's ink is applied in an even layer by a common printer's roller. The disc is then placed face down on a revolving table, which supports the centre portion of the disc, and while this is slowly revolved by hand, a smoky coal oil flame is held underneath, which deposits lamp black upon the printer's ink, consolidates with the same, and they together form an even layer of an amorphous semi-fluid mass, nearly opaque to light, and easily displaced by a style. Thus prepared, the disc is placed and screwed face down upon the gramophone. Under it, and fixed on an adjustable support, is a mounted diaphragm, bearing upon its centre a standard, to which is attached a style in the form of a flat spring of phosphor, bronze, or brass, which follows the movements of the diaphragm accurately. The point of this style is bent upward, and presses lightly against the smoked surface of the glass disc on a line parallel with it, and perpendicular to the screw shaft which moves the disc. To the

diaphragm box is attached a rubber tube, into the free end of which is fitted a pear-shaped mouthpiece of hard rubber, so constructed that the nose of the speaker, as well as the mouth, can freely enter it, and thus enable him to transmit to the diaphragm the full acoustic value of each vibration. The motive power of the apparatus is a weight consisting of a square tin box filled with pieces of lead and buckshot, and hung on a main shaft by two wire cords directly under the table. By suitable gearing the adjustment is such that the weight will have descended to the floor at the same time that the style will have traced the end of the intended volute of the sound waves. A fan regulator checks the too rapid descent of the weight, and by taking out or adding buckshot the velocity is regulated. The weight having been wound up by a crank, and the fan regulator switched in, the tin box is permitted to descend, the glass disc is rotated and progresses sidewise, and the style traces a plain volute or spiral on the lamp black surface. The material which the style scrapes off falls down, and therefore cannot interfere with the clearness of the lines, and this is the reason why the tracing is done from below.

Now when a person speaks or sings into the mouthpiece, the style will vibrate in accordance with the sound waves, exactly as in the Scott phonautograph, and the volute will assume an irregular wave line corresponding in form and numbers to the sound transmitted.

When arrived at the terminal point, the gearing is disengaged, the disc is still further advanced sidewise, and is then given a single revolution by hand, which causes the style to trace a true circle, called the "centring circle," and which enables the operator to find the original centre again. The disc is then taken from the apparatus, and the record is fixed by pouring quickly drying photographer's varnish over it. The disc then, when held up against the light, looks like a photographic negative, exhibiting a transparent sound record on a black ground. From this a photo-relief is produced by laying the varnished face on a sensitised chrome-gelatine surface, exposing this to light, then swelling in water and casting in plaster, wax, &c., so that an electrolyte can be prepared.

As a result, an exact copy of the record is obtained, formed as a groove of even depth and varying direction in a hard resisting material. This phonautogram is then centred from its centring circle, and placed upon the revolving table of the gramophone in lieu of the glass disc, but face upward. A more or less fixed style is then permitted to be guided by the groove, when this style will assume exactly the same motions which the tracing style had previously made.

The inventor claims that the speaking phonautograms are practically indestructible, and that within four hours from the time of tracing the voice in lamp black an electrolyte phonautogram, mounted to be put in motion, can easily be produced, and from this one, thousands of exact copies can be made.

## HISTORICAL NOTES ON THE OPTICAL LANTERN.

BY W. H. HARRISON.\*

ANOTHER historical firm in relation to the manufacture of optical lanterns in London is that of Messrs. Newton and Co.; the date of the foundation of the firm as opticians is lost in the mists of antiquity. Sir Isaac Newton never married. Mr. Frederick Newton and his son, the present proprietors of the firm, are the descendants of Sir Isaac Newton's brother. When Temple Bar was removed, a letter dated 1704, from Messrs. Newton, opticians, was found among the papers stored there, belonging to Messrs. Child, the bankers, addressed to Sir F. Child, asking him to pay an overdue account. This literary curiosity Messrs. Child presented to the present firm, who returned thanks therefor, and in their humorous way stated in their reply that they could find no receipt for the sum in their books, so requested the present banking firm to pay the same forthwith. The bill was for £5 13s. plus £6 6s.; the latter amount was for teaching Child's son the elements of geometry. Messrs. Newton recently generously waived all claim to the amount, and made the bankers a gift thereof, as they are the two oldest neighbours in Fleet Street. Apparently the firm once had a business in the old St. Dunstan's Church, at a time when dwelling houses and shops were erected against the ponderous walls of old ecclesiastical buildings, as may now be seen in Ghent, and some other old Continental cities.

Continued from page 803.



The three-wick lamp for the lantern made by Messrs. Newton and Son is well known to all present. Another speciality of theirs is a lantern objective to give a very flat field; it much resembles a photographic portrait combination, but has other curves, and the back lens is made larger, to take in more of the cone of rays from the condensers; the diaphragm is very large. The late Prince Albert was a frequent patron of the inventions of the firm, in whose improvements in optical instruments he exhibited steady interest. The large electric microscope recently invented by Mr. Lewis Wright, and Mr. Herbert Newton, gives a magnification of 6,000 diameters; some of them have already been supplied to American and other scientific institutions, and one has just been finished for the Science and Art Department at South Kensington. In this instrument all the rays are condensed until they emerge from an aperture no bigger than a pin's head, with which intense little beam the object is illuminated. Most of the heat is removed from the beam by means of a glass trough filled with a solution of alum. There are also arrangements by which polarising apparatus can be promptly inserted in or removed from the optical system of the lantern. Messrs. Newton are now making some improved coloured lantern slides of ideal subjects, containing more detail than usual. Mr. Freshwater is the manager of their photographic department. Several of the officials engaged on the premises have been trained up therein since they were fourteen years of age, or thereabouts.

Among manufacturers of photographic lantern slides is Mr. W. M. Ayres, of 4, Boundary Villas, Kensington, the sole representative, I think, of the Principality of Wales in the London photographic world. He was born in Carmarthen, and began business in London about 1840, when he bought his first Daguerreotype apparatus, of French make, from a painter who lived in Water Lane, Whitefriars. Like others, Mr. Ayres occasionally obtained local colouration upon his Daguerreotype plates; in one instance a red book was represented thereon, as red as blood, but he could not ascertain the conditions governing the production of these phenomena. For a time he lived in Liverpool, where he employed a considerable number of men, who once subscribed a day's pay each to present him with an inscribed silver salver.

His great care in producing lantern slides is to have every thing truly centred and ready for quick use; his cameras and plate carriers are so mounted as to be centred by a line passing through the optical axis of the lens in use. The following portions of his apparatus have not hitherto been publicly described. He has invented a mechanical contrivance made to his order, whereby he can select any portion of a large negative at will, from which to take a positive by the aid of a copying camera, and in a few moments he can cut off all light from any part of the negative but that required for the picture. By turning one little bar two shutters approach each other from above and below; by turning another small shaft two shutters approach each other from opposite sides; they all move towards one centre, which is in a line with the optical axis of his lens. The negative is placed between the two pairs of shutters. He has found this arrangement to be of constant practical value, and it gives true rectangular boundaries to his pictures. By another of his inventions he can quickly fix a small or even a broken plate in any part of the image obtained in a large camera. Six screws are mounted to slide in three grooves; these grooves all meet in the centre of the board. Two of them, like the letter X, extend to the four corners of the blackboard; the other groove is vertical. The blackboard forms the interior of a large camera back; he places his small or broken plate wherever he pleases on the board, then slides the six screws down to it, and turns them so as to hold it in their grip. Reversed negatives are taken direct in this frame, without the use of a prism. All his studio copying slides are of such dimensions as to be held in one groove, which groove is common to all his apparatus to make parts readily interchangeable.

Mr. Chatham Pexton, of Gray's Inn Road, London, is a lantern slide painter in a large way of business, fourteen years established. His method of painting slides has already been described in photographic journalism. He tells me, as others have done, that the advent of photography gradually destroyed lantern-slide painting as a fine art, coloured photographs having largely taken the place of the lantern paintings of old. Mr. Pexton first taught himself to paint his own slides, then he trained assistants to work by his methods; he says that none of his assistants ever leave him. He increases their salaries from time to time, and when they have been with him a certain

number of years he gives them a share in the profits of the business. He thinks that if this were done more generally the lives of all would be happier, and that we should hereafter have fewer complaints about the relationship of employers and the employed. He does not like the heavy import duty of 40 per cent. upon slides entering the United States, nor to the waste of his time in addition, of having to go to the American Consul's office in London to sign the declaration notes.

Another painter of lantern slides is Mr. C. Pilkington, of 32, Sackville Street, Piccadilly, London. He commenced painting slides when a boy, as an amusement, his father, a clergyman, having a lantern which he used at school and other exhibitions. The son thought he would try to sell a few slides to pay for paints and materials. Mr. Ackland (Horne and Thornthwaite) bought his first slide, to his great delight. He went on, and sold many hand-painted slides, until photography began to drive such work out of the market. Many years ago he was introduced to Mr. F. York, by Mr. J. L. King, of the Polytechnic Institution; Mr. York induced him to experiment over the problem of colouring lantern slides in quantity without deterioration of quality. This took some time to solve, but by division of labour and other devices, was at last accomplished. Mr. Pilkington married a lady of considerable artistic ability, who soon acquired the art, and was not only a great help to him, but she undertook the teaching and managing of his assistants. In his time he has coloured upwards of 50,000 slides with his own hands. He now contracts for the whole of Messrs. York and Son's colouring work, and paints slides for the public, but has to give precedence to the former work when pushed for time. He says that it is a mistake to make photographic lantern slides thinner when they have to be coloured; they give better results when they are printed to their usual density. Mr. Pilkington gives public biographical lectures illustrated by the optical lantern, and he has a method of showing "growing ferns" thereby, which method he keeps a secret. I have not seen the experiment, but in reply to a question, he told me that it is not the growing of lead or silver trees between the poles of a battery, or the crystallising of salts upon glass, but is a mechanical device.

Another branch of the lantern slide industry is that of taking negatives for the purpose at home and abroad. Mr. P. H. Fincham, of Myton Road, West Dulwich, London, is one of those who makes this his special work; occasionally he goes on a Continental tour with a 4 by 4 camera. For security he always makes two exposures upon each subject, so as to have two strings to his bow, in case of accident. He takes with him eight or nine lenses to be ready for all contingencies, but the greater part of his views are taken with a double-combination lens of 5½ inches focal length. A few years ago he took photographs along the more picturesque parts of the Rhine, and the Germans did not attempt any ridiculous interference, even when he was taking views on both sides of the river, near the great fortress of Ehrenbreitstein.

Another optical representative of the lantern world, and one of great importance in the historical aspects of the subject, is the collector of relics in relation thereto. Mr. Edmund H. Wilkie, of 11, Maygrove Road, West Hampstead, London, has made it his hobby to collect valuable objects relating to the lantern; for the last six years of the life of the Polytechnic Institution he was intimately connected with it, and at the sale by auction of the effects of the Company which owned it, he was the largest purchaser. He possesses nearly 2,000 slides of good quality, many of them of the large size used at the Polytechnic. Of the large lanterns used at the Polytechnic, and within his possession, he writes to me that the lenses are ten inches in diameter, and consist of two plano-convex lenses with their flat sides outwards; the object combination consists also of two plano-convex lenses, with both their curved surfaces turned towards the condenser; the outer end of the tube holding them has a diaphragm. These large lenses are found in practice to be very prismatic near the edges, so that a sheet of zinc, with an aperture cut in the centre, of the shape and size of the picture, is placed between the picture and condenser. He says there are several advantages in the use of these large lanterns. On account of the quantity of light passing through the lenses, the pictures possess an atmosphere and distance which it is impossible to attain with smaller lenses. The size of the pictures is 7 by 6 inches; the outer wooden frame of the slide being 11 by 12 inches the artist has plenty of scope to introduce the most elaborate mechanical effects.

In the Incantation scene introduced in a parody on the Opera of "Der Freyschütz," exhibited at the Polytechnic some years



back, the six large lanterns were all working at one time, needing four operators, and consuming, during the entertainment, 84 feet of oxygen gas. No less than sixteen slides were introduced to produce the effects in this one scene. In one of the entertainments called "Gabriel Grubb," taken from the "Pickwick Papers," the opening panorama, which is now in the possession of Mr. Wilkie, is 4 feet long by 7 inches wide. The scene in the churchyard consists of fourteen slides, including a descending panorama. He says that the disadvantages accompanying the use of large lanterns are:—(1) Great expense in the preparation of slides, each one having to be specially prepared in consequence of unusual dimensions. (2) The lanterns and lenses being large, are so cumbersome as to put them out of the reach of a travelling lecturer whose great desideratum is portability.

Mr. Wilkie is the inventor of the combination of three achromatic lanterns, and which contains several mechanical features; by its means he can replace any one of the lenses forming the condensers in a minute. This is sometimes of importance, as the great heat of the three jets, when all going at once, will sometimes, in spite of all precautions, crack the lenses. This apparatus has condensers of  $3\frac{1}{2}$  and  $4\frac{1}{2}$  inches diameter, and covered the large screen at the Polytechnic Institution, which was of distempered canvas, 30 feet high by 35 feet long. It has also been used in some of the principal halls in the country, including the Victoria Theatre and the Theatre of the Alexandra Palace, in both of which places dissolving views could only be exhibited under circumstances of unusual difficulty, owing to the impossibility of excluding all the light.

Mr. Wilkie says that on one occasion, when he was entirely out of lime, he used the bowl of one of the thick clay pipes, commonly called "Irish clays," which answered fairly well with constant watching and moving. Another time, a stout lady sat near the gas bags, and finding the atmosphere warm, took off her shawl, which was fastened with a brooch, and stuck the brooch into the gas bag, using it as a pin cushion, where it remained the whole of the lecture; the assistant was quite ignorant of what had happened until the lecture closed.

A monthly journal, devoted entirely to the optical lantern, has been in existence for two years, and is published by Dr. Liesegang, of Dusseldorf, in whose offices I first saw a copy a few weeks ago; its name is the *Lanterna Magica*, and I have pleasure in passing the latest number round the room for examination.

What has been said does not give a fair idea of the Aladdins of London, or their wonderful lamps; I have spoken only of a few typical individuals, selected hap-hazard, as I chanced to learn their address, or as they favoured me with facilities for visiting their establishments. If others in the lantern world will proffer similar facilities, and will communicate with me, it would be a pleasure to me to visit their establishments, and to give considerable time to collecting historical and scientific information about the lantern, treasuring it up for future literary use in a book, or in some other form. Nor do I desire to make such historical information local or parochial, but wish for communications from the four corners of the earth. I should like to know who was really the inventor of dissolving views, what part the Dutch took in improving early optical lanterns, and whether Kircher's original lantern is still in existence, for he bequeathed much of his scientific apparatus to a museum in Rome.

Among the questions other than historical suggested for discussion by this meeting is, supposing a first-class Italian painter were to execute a fine work of art upon a lantern slide, is the average optical system of the present lanterns good enough to do full justice to his work upon the screen? Probably, as the lantern is now becoming a popular household instrument, a limited portion of its users would not object to incur large expenses to obtain high-class artistic slides of ideal or real subjects. Could not such ideal subjects be executed in monochrome on a large scale by skilled artists, then be reduced as lantern slides by photography, and lastly be coloured by artists? I should like to ask whether the three-wick lamps of commercial lanterns are always so mounted as to be easily centred in relation to the optical axis of the lenses; also what objection there is to invariably fixing a small lens near the three-wick lamp to nearly double the amount of light the lamp will cast upon the ordinary large condenser. Can those who have invented apparatus to make oxygen continuously near the lantern, and no faster than the lantern uses it up, exhibit the said apparatus at work before this Association? Cannot oxygen for the purpose

be made as required, in the wet way, without heat, as suggested years ago by Dr. Cameron Reynolds? In many private homes the various disadvantages connected with making and storing oxygen in bags or cylinders will operate against the use of oxygen with the lantern, until some simple process is devised to give off the gas just as fast as the burners use it up, so that no storage is necessary.

## THE ADVANTAGES OF SLOW DEVELOPMENT.

BY EDWARD BRIGHTMAN.\*

IN choosing development as the subject of my short paper, it may perhaps be considered that I have selected a theme which has been nearly threadbare; but although so much has been written and said upon the subject, I think in the majority of cases the idea has been more to bring forward and claim advantages for some pet formula rather than teach principles. For my part, I place but little confidence in any formula, and consider that each picture should have a development suited to the subject.

We are all perhaps too much inclined to look upon development as a mere chemical or mechanical operation. The application of colour to the canvas by the brush of the artist is without doubt a strictly mechanical act, but as the artist by a judicious blending of colours, and an intelligent application of his knowledge and skill, converts a mere mechanical operation into a work of genius, so the photographer, by a judicious use of his chemicals, and the exercise of his experience, can stamp upon his work a certain character and individuality as distinctive as the touch of the artist.

At the present time there is a strong tendency to make our operations more and more mechanical, and to leave less to intelligence and judgment. One example of this is the use of the "Tables of Exposure," which I consider to be a complete delusion, and, so far from being any assistance to a beginner, only lead to endless complications and want of success, and moreover are one and all entirely misleading.

Any table or tables can be of no possible value unless they relate to quantities or conditions which are constant. In the case of exposures, we cannot say we have a single condition which is constant, excepting the relation of the apertures of our lenses to their focal lengths.

The rapidity of the plates of one maker may vary from those of another; even plates of the same nominal rapidity from the same makers will vary considerably; the light varies from hour to hour, and from minute to minute; the character and colour of the subject vary still more widely. How, then, can it be possible to compile a set of tables with any approach to accuracy?

Misleading and untrustworthy as all these tables may be, they are rendered still more so when further complicated by the use of the actinometer. This little instrument, useful as it undoubtedly is in the case of carbon printing, is utterly unreliable as an aid to judging the correct exposure for gelatine plates in the camera. Doubtless, the instrument might be of some service if the actinic properties of the light were in direct proportion to its luminosity, but it is a well-established fact that late in the autumn, and in the evening when the light has a yellowish tinge, the actinism of the rays is very feeble, though the light is apparently bright and powerful. Under such conditions, the sensitiveness of the test paper to such light increases in greater ratio than the sensitiveness of the bromide plate. In proof of this, we may take a slip of the sensitive paper and expose to the light, and it may take ten minutes to give, say, tint No. 1. An ordinary gelatine plate may then be exposed under a negative, and will give a fully exposed transparency in one second; then after dark let us expose a second plate to a gas jet under the same negative, and we get a similar transparency in, say, four seconds, or four times the exposure previously required. If, then, the actinometer were a reliable guide, we should have to expose the paper forty minutes to the gas jet to get tint No. 1, but we might expose forty hours or forty days, and not get any visible impression upon the paper. This example will illustrate the fallacy of using a sensitive surface of chloride of silver as a standard of comparison for a film of bromide of silver under development. I fear, however, I am wandering from the subject of development to that of exposure. The secret of success lies not so much in exposure, as in development. Let the exposure be sufficient, or let us over-expose and learn to develop properly.

\* Paper read before the Bristol Camera Society.



To develop properly, it is necessary in the first place to give sufficient exposure to obtain detail in the deepest shadows without the necessity of forcing development with an excessive proportion of ammonia. Over-exposure can be compensated for by keeping down the ammonia during development, but under-exposure is always fatal, and will never give satisfactory results. In speaking of over-exposure, I use it as a relative term, for what may be over-exposure with one developer may be a correct exposure with another.

It is impossible to lay down hard and fast rules for development, for a formula which gives admirable results with one subject may be totally unsuited to another, and it is only by a careful adaptation of the components of the developer to the subject that the best results are to be obtained; and in order to adapt the developer to the subject, it is necessary that we should understand the results obtained by varying the proportions of the ingredients.

We may roughly formulate the action of our developer thus:—Pyro. the developer proper, gives density, ammonia detail, while the bromide keeps the shadows clear and checks the rapidity of development; and the slower the development the greater the number of gradations between the highest lights and the deepest shadows. Now, as we have in nature an infinite number of gradations, it follows that a slow development will give a better and more truthful rendering of a subject than a rapid one.

In order to develop slowly, three courses are open to us: we may use a large proportion of restrainer, a small proportion of ammonia, or we may add our ammonia in successive small doses until the requisite density and detail are obtained. This latter method gives by far the best and most perfect results, and, moreover, enables us to have entire control over the development, correct errors in exposure, entirely avoid fog, and obtain brilliancy combined with delicacy and softness.

Those who advocate rapid development invariably object to the slow method on the ground of its causing a yellowness and discolouration of the film. I readily admit that a very extended development may cause a slight discolouration, but cannot consider this a serious objection, because such discolouration is easily removed by immersion in the acid alum solution; moreover, the advantages of developing slowly are so great that it would far outweigh the disadvantage arising from a slight discolouration of the film, even supposing such stain were permanent and not removable.

In the instructions issued by most manufacturers of plates we are told to use certain quantities of pyro, bromide, and liquid ammonia; then if the picture flashes out rapidly and shows signs of over-exposure, we are directed to apply more bromide, or, in other words, when the picture is half ruined, we are to do what we can to prevent utter failure.

This method of proceeding is to my mind entirely wrong, as it is building up a picture on a faulty foundation, for when once a trace of fog has made its appearance it is impossible to carry the development further without adding to the fog to a greater or less extent; but by slow development, even if a plate has been exposed five or ten times longer than necessary, it is possible to produce a negative without the slightest trace of fog, and moreover without any loss of brilliancy; and, in fact, equal in every respect to one which has received only a normal exposure.

[To show what could be done by slow and careful development, the lecturer here handed round four transparencies which had been exposed under the same negative for 5 seconds, 25 seconds, 50 seconds, and 300 seconds respectively. There was little difference between them, all four being equally clear and brilliant.]

In development I employ two standard stock solutions, varying the proportions as the circumstances may require:—

No. 1.—Pyrogallie acid	...	...	...	1 ounce
Bromide ammonia	...	...	...	$\frac{1}{2}$ "
Citric acid	...	...	...	1 dram
Water	...	...	...	8 ounces
No. 2.—Liquid ammonia, 880	...	...	...	1 ounce
Water	...	...	...	7 ounces

For an average subject possessing a fair amount of contrast  $\frac{1}{4}$  dram of the pyro solution is added to each ounce of water; should the subject be one with great contrast, the quantity of the pyro solution is lessened; should it be flat and wanting in contrast, the quantity is increased; but in every case the ammonia solution, instead of being at once poured on, is added

by successive small doses of a few drops at a time. This slow and careful addition of the ammonia I consider to be the one great secret of successful development.

I can admit that for the professional portrait photographer working in the studio with the light under control, that he may so accurately time his exposures that there may be no necessity for such careful and cautious development; but with amateurs who, like myself, practise upon all classes of subjects, from the dimly-lighted interiors of old churches or equally dark glades of our glens and woodlands, to the open landscape in brilliant sunshine, errors of exposure must occur; but if we observe the rule of always giving a full exposure and developing slowly, not a single plate should be lost.

In addition to the advantage of absolute certainty of results by this method of working, the negatives all round are certainly superior to those produced by rapid development.

#### HARVARD OBSERVATORY AND THE HENRY DRAPER MEMORIAL.

We have seen how the general photographic operations in photographing stellar spectra are carried on. One detail of work affecting the test of the plates remains yet to be described. Every plate before exposure in the photographic telescope receives the action of light over a small square area of a beam, which is impressed upon it, with definite exposure. The apparatus for thus standardising the sensitiveness of plates is illustrated here. Back of a wall or partition a lamp is placed.



Apparatus for Standardising Sensitive Plates.

Directly in front of the lamp, and a little above its wick, a small square hole is cut through the partition. On the other side of the partition, which forms a portion of its wall, is a dark room. Within this room a pendulum is hung with its point of suspen-



sion above the square aperture. The pendulum has a period of oscillation of one second, from end to end of its arc. A catch is arranged to hold it well to one side. Thus held it completely covers the little square opening. If released it swings away, and just as it passes the central line exposes the opening. It then continues its course to the end and begins to return, the hole being open all this time. As it reaches the centre of its arc on the return swing, it again shuts off the light. The bob carries a screen of such shape as to effect this operation. The opening is shielded during one-half of a double oscillation, and exposed during the other half. Half of a double oscillation gives an exposure, therefore, of one second.

Every plate before use is tested in this apparatus. The lamp, which is treated as a standard source of light, is lighted and accurately adjusted as regards height and distance from the aper-

ture. The pendulum is held back in its catch, covering the hole so that no light passes through.

A plate is set up in a support opposite the opening and about three feet distant. The pendulum is now released; it swings across and back as just described, and on its return is caught automatically. The plate is removed and another put in its place and the operation repeated for it. After this they are ready for exposure in the telescopes of the observatory. When they have been exposed they are developed, and then only simultaneously with the spectra the image of the spot of light appears.

Every plate thus bears upon it near a corner the signature of one second's exposure to a standard source of light. Those of our readers who are familiar with gas photometry will recognise a modification of the Methven screen in this lamp and opening.



The Harvard Observatory—11-inch Photographic Telescope.

It is now used altogether with the 8-inch Voightlander in carrying on the work of the Draper memorial. Its objective was made by Clark, and is a purely visual one. To make it available for stellar photography, a supplementary photographic lens was made, also by Clark. This is placed in front of the regular objectives, and corrects them for the actinic focus.

The arrangement is similar to the one adopted for the Lick telescope. The visual objective for this great telescope has been made and put in place in the observatory in California. The photographic lens is yet in the manufacturer's hands. An extra

cost of over ten thousand dollars has to be incurred in supplying it.

The point is thus dwelt on because the Clark Brothers are at present working out a combination by which the regular members of a visual objective can be used for celestial photography. The crown glass lens is ground more convex on one side than on the other. The flatter side is in contact with the flint glass lens when the combination is arranged for visual use. For photography, the glasses are separated, and the crown glass lens is reversed. Thus two lenses of the regular achromatic



combination are made to do the work of three. Had this combination been invented in time to have been applied to the Lick objective, the expense of the photographic lens would



Visual and Photographic Combinations of Lenses.

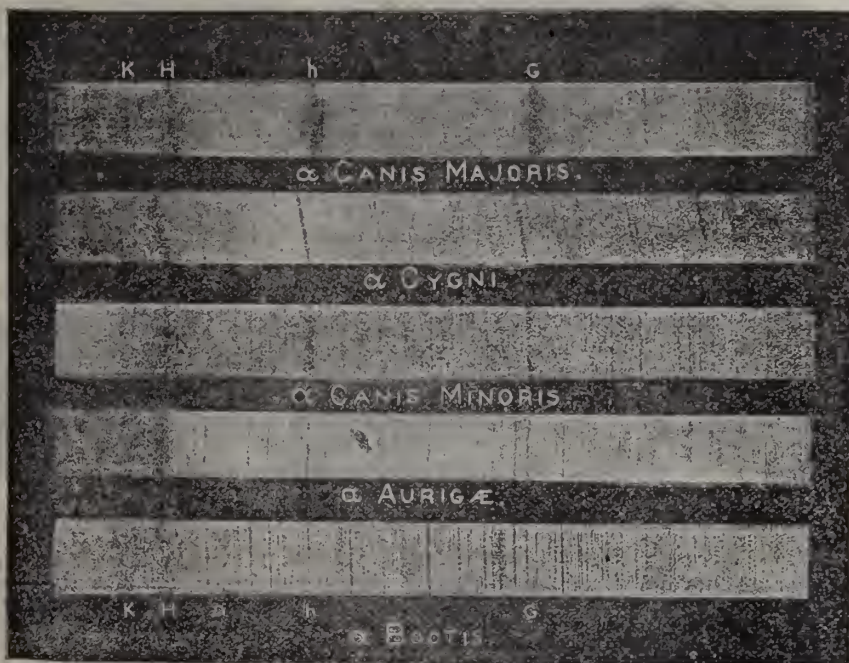
have been avoided. The new combination was devised by Professor Pickering and the Clark Brothers.

The 11-inch telescope is provided with a battery of four prisms. Each member is mounted in a brass frame, which slides into place in the large box like a drawer. When all are combined, the box and battery of glasses weighs one hundred pounds. It is a foot cube in size. It is carried by the telescope in front of the objective.

At its other end the telescope is provided, as usual, with a finder. Owing to the refraction of the prisms, the field of the

glass is far from its normal one, and the finder is set at an angle with the main axis equal to the angle of refraction of the prism. The tube is mounted in the ordinary excentric way. It is so perfectly counterpoised that it can be pulled about by the hand ropes with ease. It is driven by clockwork controlled by electric impulses from a pendulum in the laboratory building. The pendulum, in its swing, sweeps, with a point of platinum, below its bob, through a globule of mercury, completing at each swing an electric circuit. The closing of this circuit works an escapement on the base of the telescope. Without this escapement the clockwork would drive the telescope a little too fast, as it is controlled and, to a certain extent governed, by a vane wheel. The electric escapement has only to impart the last or residual correction to its movement. The building containing the telescope is a simple wooden structure, with dome, which rotates on cast iron rollers. One person can readily turn the dome by direct pushing against the handles, no tackle or gear being required. The two instruments described are soon to be supplemented by some of Dr. Henry Draper's reflectors, a twenty-eight and a fifteen inch one. The latter is one of the most perfect mirrors constructed by the great astronomer. With it he took his photograph of the moon. When these are mounted, it is intended to keep at least three telescopes at work all night.

For the spectra of bright stars near the equator, an expo-



Star Spectra.

sure of five minutes is given. For the spectra of faint stars an hour is the period. Each plate contains a number of spectra. In one case over three hundred appeared. The telescope is made to trail the spectra to a width of one millimeter (1-25 inch) as near as may be.

If the work progresses as well as it promises, most important results may be looked for. Thus the motion of stars directly toward or away from the observer it is hoped may be determined with great exactness by the displacement of the lines of their spectra. To carry out such work, a standard is needed to refer the lines to. The ordinary spectrum is of course inapplicable. Quite good success has been attained in using an absorption spectrum. A tank with glass sides, and containing hyponitric and other absorbent fumes, has been tried. This is placed in front of the plate, so that the spectra have to pass through it. It absorbs certain known constituents, producing lines corresponding to known wave lengths, to which the natural lines of the star may be referred. It is questionable if a greater triumph in astronomy has ever been achieved than the determination of the motion of a star directly toward or

away from us; and by photographic methods it is evident that a greater degree of accuracy may be introduced into the solution of this problem. The identification of the lines with those of terrestrial substances is also one of the lines of work mapped out for the future, and the grouping of stars of identical or similar spectra.

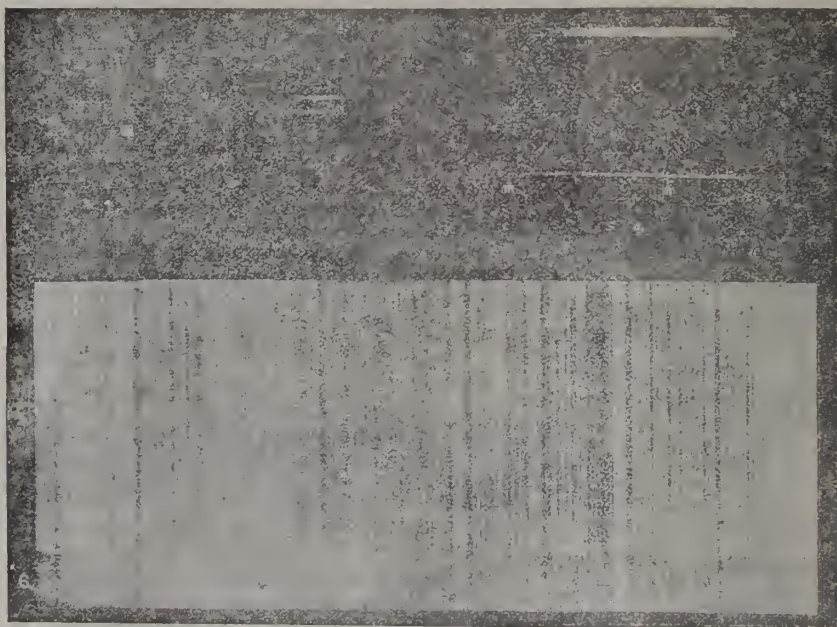
The first effort at celestial photography is stated to have been made at Harvard College observatory on July 17, 1850. Mr. T. A. Whipple, directed by Professor W. C. Bond, exposed a Daguerreotype plate in the focus of the fifteen inch equatorial which was kept pointed upon  $\alpha$  Lyrae. A very good image was thus obtained. The double star  $\alpha$  Geminorum gave an elongated image, evidently due to its two components. It was found that such bright stars could be made to give faint images, but no success followed when fainter stars were the objects. Even of Polaris no image could be obtained with any exposure. The experiments were at last discontinued. Seven years later they were resumed. Collodion plates had now been introduced, which far exceeded in sensitiveness the old Daguerreotype. A short exposure of eight seconds or less sufficed for a great many stars



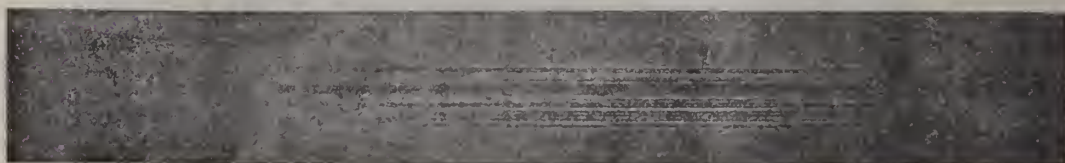
The driving mechanism of the telescope had also been improved. Professor Boud's account of these investigations is placed among the classics of astronomy. The work was continued by Rutherford and other astronomers, the work increasing in perfection as the photographic processes improved.

Dr. Henry Draper began to use dry plates. On March 11th, 1881, he reached a critical point. He obtained photographically

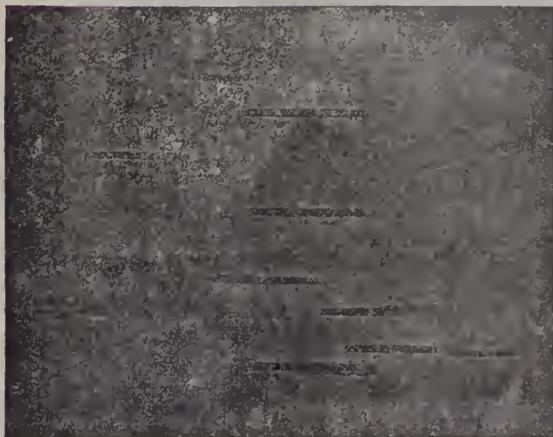
the image of a star so faint as to be barely discernible by the eye through the same telescope. This marked the point where the plate compared in sensitiveness with the retina. Even at the present day it is doubtful if the dry plate can capture more stars than can be seen by the eye. Owing to difference of colour, it is possible that some stars invisible through a specified telescope can be photographed through it, while others



Progress in Star Spectroscopy.



Star Spectrum Showing Horizontal Streaks.



Photographic Plate of Star Spectra as Developed after Exposure in Camera. visible through the same glass may not affect the plate. Mr. A. A. Common, in his photograph of the nebula in Orion, is believed to have obtained images of stars invisible through the telescope with which they were taken.

In 1863 Dr. Huggins obtained a photographic image of the spectrum of Sirius. It was merely of interest as a curiosity, being valueless on account of its poor definition. No lines could be observed in it. In 1872 Dr. Draper made the first successful photograph of a spectrum of a star. It was of Vega, and showed four lines. He and Dr. Huggins continued the work. Their method was to concentrate the light by a telescope upon the slit of a spectroscope, the slit lying in the focus



Star Spectra Showing Inclination of Bars.

of the objective. This was a very troublesome operation, and lacked the simplicity of the present method. Progress was slow until the introduction of dry plates. The old collodion plates could only be exposed a short time because the film dried, and even then were less sensitive than the dry plate. In 1882, shortly after the era of dry plate photography, Dr.



Draper died. Since that period the progress has been very great.

In the plate the recent progress of the science is shown. The scale is a diminished one. Fig. 1 represents the work of the year 1882. Five stars have their spectra in the little spot, the telescope having been directed upon them in succession with five minute exposures. Fig. 2 shows a modern spectrum of a bright star, with an adjacent one of a fifth magnitude star, as taken with the eight inch Voightlander objective. Fig. 3 is the spectrum of a *Lyræ* taken with the eleven inch objective and fifty-nine minutes' exposure through two prisms. Fig. 4, the spectrum of *b Geminorum*, was taken with fifty minutes' exposure through the same instrument, and with four prisms. Fig. 5 shows the enlargements of the same spectra between the points marked *m* and *n*. This is only a little over one-half the spectrum. Below it Fig. 6 shows an enlargement of the spectrum of the same star from a less perfect photograph.

In the other plates the different phases of the work as described in the first articles of this series are given. The horizontal streaks disposed of by the cylindrical lens, and the inclination of the lines of the spectra, can here be seen. Examples of the finished work are also given. By cutting out from the magnified spectra a band at a proper angle, the lines are brought into a perpendicular position.

These two articles can give but an imperfect idea of the work of the Henry Draper Memorial. By the liberality of Mrs. Draper, every clerical assistance is furnished that can forward the work. A large force of computers is at work reducing the observations, and the near future will witness the promulgation of a most important body of scientific data. We cannot close without expressing our thanks to Professor E. C. Pickering and Mr. W. P. Gerrish. To the monographs of the first named gentleman and to the personal attentions and explanations of the latter, and to the use of plates and prints furnished by the observatory, we are indebted for whatever of value we have succeeded in presenting our readers.

### Notes.

*Kosmos* announces a singular adaptation of photography. It is well known that under the microscope steel is found to be an agglomeration of crystals, and that upon the difference in these crystals the quality of the steel can be more or less determined. M. Wedding, to make the observation more complete, heated steel to whiteness, and as the use of the microscope under such circumstances was impossible, he photographed the metal and subjected the negative to microscopic examination.

The largest photographic album in the world, so far as mere size is concerned, is probably that which is now being prepared as a gift to the Emperor of Austria on the anniversary of his accession to the throne. The album, which is of a most costly description, the cover being studded with jewels, is to contain life-size portraits of the princes of the Hapsburg family, who have been photographed for the purpose in the various uniforms of the Austrian army which they are respectively entitled to wear.

According to *Life*, an application is to be made on the 14th inst. to the Court of Chancery to wind up the Cellier-Parkes Photographic Company. Our contemporary curtly adds, "The Cellier Syndicate was formed for the purpose of making money out of a process for colouring photographs."

*La Nature* of last week gives what it calls a representation of an amateur's studio. Judging from the size of the

figures it is at least 10 feet high at the lowest part, and 16 or 18 feet at the highest. The width is in proportion. The lady who is being photographed has the light which reaches the face softened by a screen on a stand, while the shadowed side is lightened by a two-leaved reflector. Behind is the orthodox balcony, the landscape background, and a choice collection of rocks. In the studio itself are various properties in the shape of a music stool with a back, an orthodox photographic seat, a stuffed chair, and a table, besides a circular vignette background on a stand, and a second reflecting screen of large size. The curtains on the glass side and roof are of approved construction, while the camera and stand show the pneumatic attachments are of the latest kind. One is tempted to ask, if this is the kind of thing which the French amateur is to go in for, what must the professional's studio be like!

Though the Government has not acted on our suggestion and attached an official photographer to every eviction party, it would seem that photography is, after all, likely to play a part in the settling of the Home Rule question. We have been informed that the special envoys sent by the Pope to study the Irish question on the spot last summer were directed by His Holiness to provide him on their return not only with a full and exhaustive report of their doings and sayings, but were specially directed to procure for the further information of the Pontiff a series of realistic photographs tending to illustrate the various phases of Home Rule. It need scarcely be said that Monsignor Perseco did not himself go about Ireland with a detective camera concealed in his cassock, and taking photographic "shots" at landlords and agents and tenants, &c.; but it is said that this ecclesiastic has taken care to have the Holy Father's wish carried out most fully in the matter of photographic evidence. So much so that the Pontiff will have quite a comprehensive photographic history of the state of affairs in Ireland to guide him when he receives Monsignor Persico's report.

A programme published in advance advantages a Society in many ways, especially when the programme is one so attractive as that just issued by the Cardiff Amateur Photographic Society. For Wednesday last the subject was "Photographic Printing," by H. C. Emery, and the following subjects fill the meetings held at 8, Working Street, till the end of May:—January 18, "Demonstration of Photography by Magnesium Light," by Alexander Keller. February 15, "Norwegian Scenery," illustrated by limelight, by C. Henry James. February 29, "Spirit Photographs," by D. Josti. March 14, "Microscopic Photography," by J. Storrie. March 28, "Lantern Slides, how to make them," by W. Davies. April 11, "Platino-type printing practically demonstrated," by S. W. Allen. April 25, "Enlarging," by W. Kitchin. May 9, "Bromide Printing," by S. W. Allen. May 23, "Theory of Toning," by Jesse Williams.

Another noteworthy point. The Society adds a note that a demonstration of the use of the "Vergara Film" is

wished for. When will the Photographic Society of Great Britain be so vigorous as to be able to announce a series of ten attractive subjects in advance, and at the same time to indicate by advertisement what else is desirable? Long ago the Council appointed a special committee to look after the provision of papers. Some member might ask for any report the Committee has made of its work.

We have not quite done with the Cardiff Society's notice yet. The card on which it is printed we noticed to be thin, yet unusually strong, and on examination we found that a thin cotton fabric, or muslin, is empasted on it. This sort of card should have many uses in the photographer's workshop.

Rather a complex system seems to be the new Austrian one of selling railway rides wholesale. First you buy a sheet of stamps, each of which entitles you to ride a distance of one kilometer, or rather under a mile, but you must purchase something like ten pounds worth of these at a time, and the saving is about twenty per cent. on ordinary rates; but the restrictions on their use are curious. They are only available during twelve months, and will only be accepted from the individual to whom they were issued; this person having to prove his identity by showing a photograph of himself, which is fixed to the stamp sheet when issued; moreover, the stamps themselves have to be exchanged for a ticket at the booking office before the holder can take his seat.

Perhaps no paper published during the past year is of equal importance with the account of the latest modification of Pizzighelli's direct platinotype process, one instalment of which will be found on page 1 of our present issue.

The fact that definite commercial salts are used in making the sensitive preparation renders the process quite an easy one for any photographer to try, and we may expect that many will try it.

In America the Eastman Company prepare a transfer or stripping film to be used for the transfer of positives to opal, glass, wood, paper, or other materials—in fact, for making silver positives which may be transferred or used like carbon images. The stripping bromide film consists of paper prepared with a layer of emulsion suitable for positives, but between paper and sensitive film is a layer of soluble gelatine. The general manipulations are similar to those incident to the stripping negative film, only the image is left on the solid support.

When an artist speaks of photography, the photographer may generally learn something, and this is especially the case when the artist speaking has himself some knowledge of photography.

Hence the paper of Norman Macbeth, which will be found on page 13, possesses much interest for our readers,

Mr. Macbeth being an artist of repute, and at the same time not altogether a stranger to the use of the camera.

He says, "There are things introduced by skill in portrait painting which are beyond the power of the photographer to accomplish, at least to a very limited extent;" and although we fear there is much truth in what he says, it is to be hoped that the photographer will take up the challenge, and by deed disprove Mr. Macbeth's words. We feel sure that no one would be more pleased at this than would be Mr. Macbeth himself.

One disadvantage of the photographer, as compared with the painter, is well touched on: the fact that a sitter reckons to get through with his engagement with the photographer in about as many minutes as he would be hours with the painter.

### ART IN PHOTOGRAPHY.

BY C. I. BURTON, B.Sc., F.C.S., F.R.S.E.

WHAT an astonishing amount of rubbish has been written and uttered on this subject during the last few years! every amateur who has happened to produce a pretty photograph, and many who have not, seeming to consider himself qualified to instruct his brethren in the production of "artistic" photographs.

These people are willing to admit that artists are born and not made; yet, notwithstanding this obvious truth, hundreds of men go about the world with a fixed idea that if they could only have their way, they could make every photographer into an artist. This desirable result is usually to be brought about by the blind acceptance by the embryo artist of certain maxims or aphorisms compounded by the daring artist-maker, with an equal neglect of clearness and the rules of English composition. For instance,—

"Contrast gives emphasis, it has also to do with lines or forms crossing each other, and not running in nearly contiguous lines. These repetitions enfeeble a picture."

"Balance should govern masses and keep them within the precincts of harmony. It regulates proportion, which, in its turn, lends itself to beauty."

"The faculty of placing an artistic mean between two or more existing elements, constitutes much of the art-sense of the artist."

These samples are not "craftily isolated;" the context gives no clue to their meaning.

These maxims have one great advantage, that they are indisputable because they mean nothing, and for the same reason they may be taken to have any meaning we like.

They may contain all Ruskin in a nutshell, but I am much more inclined to think that they are mere "clotted nonsense."

Much might be done to raise the artistic level of photographic work if photographers would give up talking about art, and trying to teach each other what they don't know and cannot learn, and attempt instead, in a dim way, to feel the beauty that is in nature and life; for it is very certain that the more a man feels the beauty of whatever he portrays, the more beautiful will be his reproduction of it, whether photograph or picture.

### COLD WEATHER AND PHOTOGRAPHY.

THE season is now upon us when all kinds of complaints and inquiries about difficulties in photographic manipulations crowd our table, the principal cause of which is the advent of cold weather. Every year we are deluged with these letters, and therefore take this opportunity to call the attention of our readers



to some of the pitfalls and snares that are to be avoided when "Jack Frost" is master of the situation. Our attention was recently called to the influence of cold weather on photographic work in the return of some plates to the dry plate manufacturer because they would not develop. On looking into the question it was found that the plates were perfectly good and developed beautifully, leaving nothing to be desired in the density, clearness, and detail of the negatives; but on questioning the operator it was found that he had used a cold developer, and still further inquiry showed that it was only two degrees above the freezing point of water, or at thirty-four degrees Fahrenheit. Now this is not the temperature that dry plates are expected to develop at in any reasonable amount of time. Of course development would take place at such a temperature, but it would require an amount of time that is not worth wasting upon them when at the proper temperature (60 to 70° Fahr.) a properly exposed plate will develop in five or ten minutes. Another difficulty that arises with developers in cold weather is the crystallization of the sulphite and carbonate of sodium in the bottom of the bottles, and the consequent weakening of the developing power of any given volume. This is particularly true when solutions are used that are saturated at ordinary temperatures (60° Fahr.), and applies equally well to ferrous sulphate and potassium oxalate as it does to the pyrogallol and soda developers. Great care is therefore necessary to keep all the various solutions used in developing at a moderate temperature, and in such positions in the studio and dark room that they cannot be suddenly chilled and their normal developing power diminished. There is too much carelessness in this matter, both with professional and amateur photographers; and manufacturers are blamed severely for difficulties that are solely due to the indifference or utter disregard of circumstances by the manipulator of dry plates.

Another fact that should not be lost sight of in cold weather, is that solutions that differ much in temperature will produce frilling upon dry plates. If, for example, the developer is at 40° Fahr., and the alum or hypo baths are at seventy, there will be a strong tendency to frilling exhibited by most of the brands of plates now upon the market, unless tropical plates are used.

The influence of cold weather is not confined to the manipulations necessary to the production of the negative; but the making of albumen prints is even more open to difficulties. Blisters, measles, and such troubles are almost invariably due to having the various printing and fixing baths at too low a temperature; or, what is far more dangerous, at very different temperatures. A little thought of difficulty that may arise in printing is the staining of unvarnished negatives from contact with the silvered paper. This may come about after this manner: A negative is brought from a cold room into a warm one, and the moisture in the atmosphere begins to condense on its surface in the form of dew. Owing to the dullness of the surface of the gelatine this is not often noticed, and on placing the sensitized albumen paper into contact with it in the printing frame the silver nitrate passes into the gelatine film and stains the negative.

We have submitted the above observations to our readers because the particular time of the year is now upon us when difficulties of the character we have mentioned will constantly occur; and there is a good old adage which says, "Prevention is better than cure."—*Anthony's Bulletin*.

## COMPOSITE PHOTOGRAPHY.

BY ELLERSLIE WALLACE.\*

OUT of the mixed mass of matter that modern photography presents to us, there are some things that would be better suppressed altogether. It is a matter for great regret that considerable numbers of those practising our beautiful art do not scruple to lower it to absolute quackery, sometimes to revolting indecency, often to the multiplication of "cheap and nasty" forms of design, and still oftener to silly pastime or childish absurdity.

With many persons, indeed, the idea seems to be to pursue photography in any and all ways rather than the legitimate ones that have rendered it so useful to the world, and so universally and justly admired.

I do not propose to enter at any length into a subject like this, which must have forced itself upon the attention of every thinking man who has any interest in the camera, but there is one of these absurd quackeries that seems to be commanding the serious attention of people of education and attainments, and

who really ought to know better. I allude to the so-called composite photography. Now, it is well to have the desire of hearing new things and seeing new inventions, but when I see such nonsense as composite photography gravely treated in a scientific manner by respectable magazines that are read by the general public, and even by the journals devoted to our own craft, I can only say that it makes me feel very sorry.

Composite photography claims to give a normal type or average of the features of a number of individuals; and the assertion that each exposure on each subject partially destroys and partially adds to the image previously existing on the film, is just one of those nicely-contrived bits of scientific speciousness that can easily hoodwink anyone not understanding the technical part of photography.

If a draughtsman draws on a rough-cast wall with a chunk of dry colour, or on the smoothest of paper with the finest pointed pen, he makes an outline in either case, because he attempts the representation of one object in one place. Composite photography attempts the representation of an unlimited number of objects in one place.

For the same reason we cannot compare the "composite" with a badly focussed plate, because the latter has an outline, no matter if the image be hardly discernible. The form is there just as it is in the drawing on the rough-cast wall.

A "composite photograph" cannot claim to be a picture in any sense, because it is merely a jumble of uncombined outlines. The expression "uncombined" is a foolish one, perhaps, for two outlines cannot be combined upon the same surface or film. Let us take an example from the stereoscope: here we have two images the same in size to a hair's breadth, just as the images of any object are when formed upon the retinae of the two eyes. The only difference between them is that the one taken with the right-hand lens gives a rather more right-hand view of the subject, and *vice versa*. How are they made to combine? By means of an ingenious and beautiful optical trick, which diverts the lines of vision from their normal course; the prismoid lenses of the stereoscope acting in the one case, and the simultaneous outward rotation of both eyeballs (binocular vision) in the other, when no stereoscope is used. But suppose we cut a stereo slide in two, set each half in a magic lantern, and project the images on a screen. We may make them overlap, but have we combined them to a perfect whole? No. So, in the stereoscope, the images are but apparently combined, and the very beauty of the quasi-solid picture lies in its unreality.

I take it that any picture to be a picture must have an outline. A "composite" of ten sitters made with ten exposures, no matter how carefully graded, would have ten outlines. Is it therefore ten times a picture? It certainly is not ten pictures. We have ten outlines, each striving for the dominant position, but we know that two outlines can no more occupy the same place than two bodies can occupy the same space at the same time.

Let us suppose that twenty of us here to-night were walking on a beach by the sea, and that we determined to make a "composite" foot-print in the wet sand. The form of each man's foot would then be impressed over the preceding one, and the result would be a lot of tramped down sand, nothing more. This comparison with Composite Photography is a perfectly just one.

Again, suppose the twenty of us were to commission one of the number to go to some sculptor or moulder in clay and request him to make a "composite" statue of the whole twenty, with or without twenty outlines. I should rather expect him to be answered as the old gentleman was who desired the London judge to recover his stolen property for him: "Sir, does your mother know you're out?" This comparison also is a perfectly just one.

I have recently seen a "type-composite" of some seventy lady graduates of a well-known college. While I am hardly in a position to judge of the intellectual average thus shown, I can say that a phrenologist would look in vain for the bump of photographic-common-sensitiveness or chemico-physical-comprehensiveness.

If I am entirely wrong in this matter, however, and if such a thing as composite photography really exists, I shall always regret that I did not attempt some "composites" of European scenery when abroad with my camera a few years ago. "What is sauce for the goose is sauce for the gander," and if it is possible to make a composite of eighty different people, it is also possible to make a composite of eighty different outdoor views. I think that a composite of English cathedrals, Dutch windmills, French and German timbered houses, Belgian hotels-de-ville, Swiss mouq-

\* Read before the Photographic Society of Philadelphia.



tain scenery, and street views pretty much everywhere, all combined on the same plate, would have been a new departure in landscape photography, and, together with the portrait composites, might well bear the title, "Confusion now hath made his masterpiece."

Constantin, in his "Idees Italiennes," has remarked that the "rapidity and suddenness of movement on the part of the demoniac boy, in Raphael's great picture of the Transfiguration, is such that the draperies have not had time to follow the impulse of her body. She alone has turned. Her girdle, left behind by her movement, seems to be placed awry, but we soon perceive that if she were to return to her former attitude it would be in its proper place."

"Raphael always leaves around his figures the space necessary to indicate the position in which they were at the moment immediately preceding that chosen for the painting, and is very careful not to fill up the void which they have thus left behind them."

It is thus that Raphael succeeds in giving a spontaneity of movement to his figures which is truly marvellous.

Instances may likewise be selected from the work of Titian, in which the expression of motion and animation is masterly portrayed. In a small picture representing Christ appearing to Mary in the garden, the Magdalene seems fairly to run forward to meet the Lord, her streaming hair and drapery denoting the utmost rapidity of her action, while the hand stretched forth to touch him is suddenly checked at his words, "Touch me not."

I have never had the privilege of seeing the originals of the great masters, but even in the engravings and photographs which are accessible, the indescribable charm of motion is not lost.

Michael Angelo is rich in illustration of the power of conveying the idea of motion, by suggestion, but we have cited enough examples. Even amongst the minor painters we often find the previous position of the figure indicated by the manner in which the apparel is disposed upon the ground or upon some near object, as a chair. We believe the photographer would do well to imitate the painter, if he desires to convey the idea of motion, rather than to seek for action in transient attitude alone. A transient attitude may indeed be depicted, but not isolated. There must be other objects associated to carry the mind from one phase to the other, so that it weary not of the perpetual sameness.

How insupportable do those statues of heroes become, upon their solitary pedestals, with arms extended, for ever holding the uplifted sword! Yet place the same figure in the same attitude in a painting, marching at the head of a victorious host, with streaming banners, and the mind has something to turn to for relief, and the impression is strong and full of enjoyment.

With what delight have we watched the wonderful play of sun-light upon the waves of the ocean, and how grieved, because our cameras gave so tame a rendering of their beauty.

What has the sensitive film, with its quick perception, done with those peculiar elongated streaks of ever-shifting light, which excite the rapture of the painter, which not only interpret the form of the large masses of water, but also the shape of the tiny waves sculptured upon their surface.

The instantaneous photograph reveals the truth, but the vision of beauty has vanished. "Truth is not beauty" here. In the photograph, in place of the lines of light presented to our vision, we have but rounded dots of the reflected image of the sun, which become elongated by the motion of the waves, and are so impressed upon the vision.

Waves breaking upon the beach, for similar reasons, appear different to our eyes from instantaneous photographs of the same. The impression we receive is not of any single wave movement, but the resultant of the rapid presentation of several movements in succession.

The opacity of instantaneous pictures of waterfalls, and the transparency of real ones, is no doubt due to the same physiological cause, the infirmity of our vision.

#### EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF IRELAND.

(HELD AT THE ROYAL HIBERNIAN ACADEMY, DUBLIN, NOVEMBER, 1887.)

THE following is sent by an occasional contributor, our own notice having appeared in the issue of Nov. 11th:—

THE exhibition which has recently closed deserves great praise, not only as a carefully classed and well displayed collection of photographs, but as showing the energy and care displayed by our Irish brethren-in-photography in carrying to a successful issue an enterprise which was threatened with failure by apathy on the one hand, and on the other by the agitated state of public opinion existing in the sister Isle. The questionable economy of semi-advertisement also threatened failure. And the fact that "swopping horses when crossing the stream" invariably gives the "eroakers" a chance to mourn an exhibition into a premature grave, has also to be taken into account, for Greenwood Pim having resigned as Hon. Secretary (by which resignation he ceased to be a member of the Exhibition Committee) J. W. Semple was appointed in his stead. Yet, in spite of all this, the exhibition has been a success both popularly and financially, and this was mainly due to the renewed efforts of the committee, and a further energetic advertisement. The lantern evenings (of which there were sixteen in five weeks), under the management of J. C. Semple, assisted by T. A. Bewley, were a great success. And here we have a word to say of Messrs. Oakley and Baird, of Bermondsey, whose gas regulator and controller was used on these occasions, and gave great satisfaction. Turning to the apparatus, the displays of Messrs. J. F. Shew and Co., Messrs. Watson and Sons, London, of W. Tylar, and of J. Place, also Messrs. Gallimore and Taylor, of Birmingham, and Messrs. Robinson and Sons, and Thos. Mayne, of Dublin, all and each attracted the general attention and praise of those interested in photography.

A combined enlarging and optical lantern, invented by Mr. J. C. Semple, which was used for dissolving views on the night of the American lecture by that gentleman, came in for its share of praise. Mr. J. Veda Robinson's latest inventions in cameras and double backs also held the attention of discriminating photographers. There were no medals in this class, which we submit was an oversight. Coming to photography, we notice a fine exhibit of burnt-in photo-enamels, by Mr. J. G. Tunny, of Edinburgh, whose other exhibits, Nos. 103, 108, 113, 142, were much admired. Of Mr. Tolley's "Lonely Shore" we need only say it deserved its silver medal. No. 276, "Old Street, Sallics, Basses Pyrenees," by George Mansfield, Esq. (amateur), was a gem; technically and artistically it touched perfection. "The Beautiful River," No. 89, by Mr. J. P. Gibson, Hexham, was indeed a beautiful "little bit," while Mr. Watson's "Studies at Eventide" were most artistic. Mr. W. H. Hyslop's "Yachting Studies" were exemplifications of what skill, patience, and knowledge of "effect" can achieve. Of the well-known yacht photos by Messrs. West and Son, we can affirm they were fully up to their usual excellence. Mr. Parry and Mr. Keene's "Interiors" well merited the awards. In the portrait class the exhibits were unusually fine; many of the photos being of nearly equal merit, the allotment of prize medals was no easy task, but the consensus of opinion supported the judges in their awards in this most difficult matter. Messrs. Werner and Son's "Portrait of a Lady," a magnificent piece of pure photography, bore away a well merited first prize. Mr. H. S. Mendeissohn's artistic "Rembrandtesque" "Head of an Old Gentleman" took the bronze medal. This was a most carefully lighted picture, having the general appearance of a study by some old master. A frame of beautifully finished cabinet portraits, by Messrs. Werner and Son, secured to them their second silver medal; while an enlargement to life-size, from cabinet bust, of H.S.H. Prince Edward of Saxe-Weimar, added No. 3 to their other silver medals. As the judging in all classes was by number, the securing of three silver medals by Messrs. Werner and Sons shows how well they merited them, and the impartiality of the decision. The second medal for cabinet work for a frame of exquisite portraits by W. W. Winter, was a well-deserved distinction, for one could gain lesson after lesson in light in pose, from this exhibit. The silver medal to Frank H. Sutcliffe for his "Water Rats," together with the great sale of copies, attested again the careful awards made by the gentlemen who undertook that onerous duty. "The Village Rhymster and His Victim," a genre work by W. W. Winter, which showed careful handling and a keen sense of the ludicrous, took a bronze medal. To No. 266 was allotted the bronze medal for a fine enlargement by R. B. Berry, of Bolton. To amateurs in the enlargement class, a bronze medal was awarded to No. 258, a beautifully finished picture by C. W. Huson, Esq., Liverpool, and a special bronze medal to J. C. Semple, Esq., Dublin, for No. 194, "Ovoca," an enlargement from quarter-plate to 24 by 34.



In the following classes only bronze medals were awarded. For opals to Messrs. Robinson and Sons, Dublin, for a frame of well executed portraits. Mr. H. Davison, Hon. Sec. Camera Club, secured a well merited bronze medal for a set of six lantern slides, also one for a "Cottage Study" in platinotype, No. 137. No. 62, by G. S. Waterlow and Sons, was adjudged to be the best photo by mechanical process, and the bronze medal for studies of animals or birds fell to G. T. Jones, Kingston-on-Thames, for No. 501, "Dogs." In professional enlargements those by Samuel Fry and Co., Kingston-on-Thames, and the Autotype Co's. work, divided the praise, while some enlargements from negatives taken by Messrs. Shew's hand camera met with deserved approbation. The lantern transparencies by Messrs. York and Son, as also those of Mr. P. H. Fincham, were greatly admired. Altogether, twenty three medals were awarded, sixteen going to England, one to Scotland, and six resting with the Dublin exhibitors. There were no gold medals or "Honourable Mentions."

#### A FEW REMARKS ON THE CONSTRUCTION AND REQUIREMENTS OF PORTRAIT ART.

BY NORMAN MACBETH.\*

PORTRAITURE has in every age been largely employed to provide some permanent record of the characteristics of men and manners. This has been its origin, and is its purpose. There is no branch of fine art which takes a higher place than that of historical portraiture, both past and present.

Photography has greatly contributed to the observation of individual variations of character, and but for it we should have been slow to discover those subtleties of feature, form, and expression, which are its charm. Nay, more, it reveals to us much of the truth of foreshortening in perspective, when the lens has not been unduly strained. Also the beauty of modelling, in the graceful and flowing lines of dress and drapery so much used in composition, all of which, in portrait painting, have hitherto only been mastered through years of great practice and experience. Although from our youth we have been accustomed to have these forms daily before our eyes, yet we have mostly failed to realise their importance and significance till presented to us by a pictorial method. It should be our object in portraiture to depict the form and features in an agreeable manner and pleasantly composed, at the same time that we endeavour to embody something of the inner man by dwelling on the individualities which are characteristic of his nature and attainments. Success depends in the first place on the individual who can artistically arrange the sitter, and secondly, on the person who sits and carries out with proper action the mind of the artist.

It is to be feared that in photography, owing to the limited time afforded by the sitter for the arrangement and development of a portrait, little or no time is spent in the study of the character presented, but more than that, so much of individuality is present that the photographer, trusting too much to his instrument, overlooks those qualities, viz., feeling and expression, on which character mainly depends.

There are many qualities introduced by skill in portrait painting which are beyond the power of the photographer to accomplish, at least to a very limited extent, for instance, that of leaving certain parts out which may be prominent in the subject. The painter does this by way of procuring breadth, or massiveness. This the photographer cannot easily do, except by under-exposure, which he rather tries to avoid. There are other qualities which may be introduced by way of giving force and prominence to the more important points of the character. The painter expresses these chiefly through the influence of intensified colour and concentrated light and shade. These operations are mainly the exercise of the mind qualities apart from the subject, and if it is possible to produce them in any measure by photography, it can only be accomplished by contrivances for the concentration of light, presumably artificial, either electric, magnesian, or gun cotton.

It is of the greatest importance, after a portrait has been entrusted to our care, to take advantage of any opportunity afforded to us of looking well at our subject, more especially taking note of his movements during conversation, whilst he is free from the consciousness of being watched, previous to actually sitting down for the purpose. Everyone who knows the value of this, has his own methods of going about it; but this condition,

this element and feeling of unconsciousness, should be carefully watched, remembered, and taken advantage of.

In speaking now more directly on the construction of portraits, and their general requirements in point of art, I shall first call your attention to the placing of the subject on the canvas or what corresponds to it—the focussing glass. The head not unfrequently in painting, is begun without considering the limits or extent of the subject on the canvas. Many a portrait has been a long way advanced by reason of dwelling on the head exclusively to the neglect of considering the composition of the other parts and the room they require to do them justice.

The photographer has an immense advantage over the portrait painter by reason of his being able to obtain a view of the entire figure at once upon the focussing glass, and by making use of divisions and intersections marked thereon (as I shall presently explain), he is enabled to judge more readily of the general effect of his arrangements. These materially assist in giving proper balance.

In portraiture the head is the ruling part of the figure, and according to the extent that is wanted of the figure, so each size must have a certain space between the top of the hair and the boundary line at the top of the picture. To determine this space, divide the head into four equal parts from the chin to the top of the hair. There are three sizes which require only the space of one-quarter of the head above the hair, and in which that limit should never be exceeded, viz., the English head size, 25 by 20 inches; the common head size, 30 by 25 inches; and the Kit-cat, 28 by 36 inches. In the former two a hand may be introduced if done judiciously, naturally, and kept secondary. There is one size, the small half length, 34 by 44 inches, which requires one-half of the head above the hair. The ordinary half length, 50 by 40 inches, requires three-quarters of a head above the hair, and the Bishop's half length, 54 by 44, the largest of those less than full size, requires a full head, unless it be when the subject happens to be unusually tall; in that case bring the top of the hair nearer than the space of a head. If the subject be small then lower the head. The space above the head between the hair and the top boundary of the picture, is the only way in which one can give a feeling of the size of the individual when the feet are not seen, and to a great extent it may and ought to be regulated accordingly. These proportions of the head are specially to be recommended, inasmuch as they invariably give height and dignity to the subject, a feeling and operation which Velasques, Vandyk, and several of the Venetian painters very much regarded. Finding a certain space above the head, according to the size of the subject, the terminations at the side and bottom naturally fall into their respective places. An English head size has no hands introduced. A common head size may have a hand, but not unless it comes in very naturally, and without detracting from the interest of the head. The Kit-cat size, as it is called, on account of its being the uniform size of the portraits of the British Essayists in their club room, has hands introduced. In doing so we should bear in mind that they must either be well apart or both together. When partially separate, a conflict of interest is set up between them; they must always be subordinate in interest to the head. The small half length, 44 by 34 inches, is well suited for ladies or gentlemen of ordinary size. The cabinet size, so named by photographers, may be compared to this in its proportion and the extent of the figure it takes in. The limbs are introduced, but not much of the chair on which the person is seated, and it ought to have little or no accessories in the shape of furniture. The ordinary half length, 50 by 40 inches, is one of the best sizes for doing full justice to any subject, and admits of accessories which should never be introduced merely for their own sake. When employed, they should either be for the introduction of a piece of colour, an article associated with the individual, or, to compose by lines, certain forms which balance others, and so counteract that which otherwise could not be improved. The Bishop's half length, as the name implies, is suited for very ample costumes, such as surplice and sleeves. The terminations of the figure at the bottom of this size do not include the feet. Some of the best examples we have of this size, 54 by 44 inches, are to be found in the works of Sir Joshua Reynolds, and of some of the leading painters of the Royal Academy, particularly Millais, Herkomer, Pettie, and Holl.

It is to be regretted that the application of art to photography is not yet sufficiently advanced to demand from the makers of different sizes of cards and mounts those proportions which have been long recognised and maintained by the best painters. They are to me, and to everyone who has given any observation to the

\* A Communication to the London and Provincial Photographic Association.



requirements of portraiture, good authority for what is and should be adopted. In frequenting the leading exhibitions of fine art, special attention should be given to the endless variety of boundaries of pictures created by the subject, portraiture being the most limited. We should ever be on the outlook to see how the subject has been treated, and when we seek to follow that which is good, to be on our guard that we are not hampered by a prescribed amount of accommodation, compressing the subject and torturing it to be within certain limits. I would rather see the boundary line of a portrait pass through portions of the limbs, than that the subject should appear confined and under restraint.

We must ever keep in mind that it is the subject which regulates boundaries, and not boundaries the subject.

It is desirable that eccentric or peculiar shapes of pictures should be as much as possible avoided. Oval forms are very pleasing, and well suited for the treatment of some subjects, and as frames for some places, but they are not severe enough, and they have the tendency, consequently, of making the subject to appear secondary. To give all the value possible to the subject, we ought to be very careful with that which comes near and impinges on the picture—to a portrait especially.

(To be continued.)

## Correspondence.

### THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

DEAR SIR,—In reference to some assertions which have been publicly made respecting a "written protest" against the nomination of a candidate for election as a member of this Society, which protest, it is stated, was placed in my hands on Nov. 8th, I beg to submit that if all these assertions are perfectly true, this conclusion must be inevitably arrived at, viz., that I knowingly and willfully kept back and suppressed this "written protest" from becoming known to the President and Council, and also to the nominator of the candidate alluded to.

Now, as I am responsible only to the President and Council for all my actions connected with my work as Assistant-Secretary, it appears to me that I should first be heard before that body before I make any further reply other than what I said on Dec. 13th, in presence of the President, viz., that "I have not the slightest recollection of such a matter, nor of any paper having been handed to me," as also "I was looking through all my papers, collected together during the exhibition, on the previous Saturday, Dec. 10th, and if such a paper had been amongst them I must have seen it."—Yours faithfully,

EDWIN COCKING, Assistant Secretary.

5A, Pall Mall East.

### THE OPTICAL CENTRE OF A LENS.

DEAR SIR,—Mr. W. H. Wheeler, in the current number of the NEWS, demurs to the identification of the doctrine that the optical centre of a lens is a fixed point, and that every lens has an optical centre, with "the general teaching of elementary text books," and quotes from one book, Potter's, in support of his hesitation.

Ganot's Physics is as well known as any text book to the students I have come across, and the English edition is by Dr. Atkinson, Professor at Sandhurst. In the 6th edition, page 440, we read, "In every lens there is a point called the optical centre . . . which has the property," &c. "The existence of this point may be demonstrated," &c. "In double concave or concavo-convex lenses the optical centre may be determined," &c. "In lenses with a plane face this point," &c.

I next turned to the account of a lecture by Joseph Zentmayer, an optician, I believe, of no mean ability (see PHOTOGRAPHIC NEWS, 1876, page 326), and here it is stated that "The general properties of lenses, which are of importance, are:—First, the principal axis; second, the optical centre," &c. "Every lens possesses a point—rays of light passing through that point. The optical centre can readily be

found." But let us reduce "one surface by making it a concave or negative one; it is clear that the optical centre still marches on, moving out of the lens; and if we go on so far as to make the negative curve equal to the positive one, then the optical centre will be in infinity, and if we disregard the thickness, we have no lens, but a non-optical glass like a watch glass."

It is worthy of note also that these authorities use the optical centre in showing the formation of images by lenses, thus at once connecting the optical centre with photographic optics; for the one and only use of a photographic objective is the formation of images.

I am convinced that, if I were to pursue the matter, I could very soon find other elementary text books and other teachers of elementary optics saying the same; but what I have quoted is sufficient to justify my statement that Mr. Wheeler was attacking not me, personally, so much as the ordinary notions.

As to whether these ordinary notions are useful as generalisations, I am afraid I must be content to differ from Mr. Wheeler. This is a matter of opinion which, to quote from Mr. Wheeler's last sentence, "I would respectfully leave to the consideration of your readers."—I am, dear sir, yours faithfully,

CHAPMAN JONES.

### THE CAMERA CLUB: LECTURE BY H. TRUEMAN WOOD.

DEAR SIR,—May I draw your attention to the subject announced for Jan. 12th here. Mr. H. Trueman Wood will give a lecture on "Phototypography and Photogravure," and has taken great pains to get together a collection of interesting illustrations of processes, &c. We hope to have a very large gathering of gentlemen interested in the subject technically, or in its bearings on art.—I am, dear sir, yours faithfully,

J. DAVISON, Hon. Sec.

Camera Club, Bedford Street, W.C., January 3, 1888

### THE CRYSTAL PALACE EXHIBITION.

DEAR SIR,—May I ask you to be kind enough to make known to your readers that within a week of the issue of circulars ament the above Exhibition, nearly the whole of the space originally planned for the apparatus section in the nave of the building had been taken, and that the Executive have now made arrangements for a further extension also in the nave. It is therefore desirable that would-be exhibitors apply early in order to secure the best remaining positions, although all are good.

In the Camera and Lantern sections also the enquiries for space and particulars are most gratifying to the Executive, and in spite of the large area of screen surface available, the competition for choice of position will soon undoubtedly become keen.—I am, dear Sir, yours faithfully,

S. G. BUCHANAN WOLLASTON,

Member of Executive Committee.

3rd Jan., 1888.

## Patent Intelligence.

### Applications for Letters Patent.

17,892. MARTHA ELIZA NORRIS, 33, Stoke Newington Road, Middlesex, for "Improved prepared glass in imitation of gilt, silvered, frosted, or ground glass for decorative or advertising purposes, and for affixing to prepared glass, hand-paintings, photographs, oleographs, chromographs, drawings, prints, engravings, or other designs, and making them transparent or opaque, and covering them in imitation of gilt, silvered, frosted, or ground glass for decorative or advertising purposes."—Dec. 29, 1887.

16,136. EDWIN JENNINGS BALL, 39, Aynhoe Road, Hammer-smith, W., Middlesex, for "The application of photography to automatic sale and delivery machines, and the utilisation of automatic sale and delivery machinery for the production, sale, and delivery of photographs."—Nov. 23, 1887.



16,576. JOHN EDWARD THORNTON, 3, New Lorne Street, Moss Side, Manchester, for "Improvements in photographic roller slides and mechanism connected therewith."—Dec. 2, 1887.

Specifications Amended under the Patents Act, 1883.

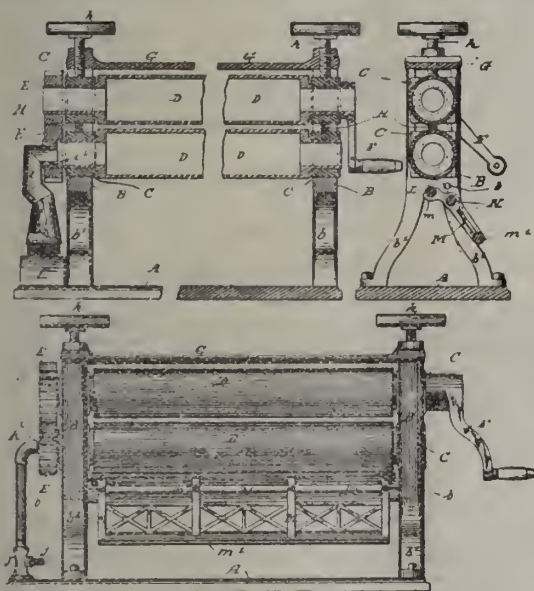
1380 of 1883. R. W. BARNES and J. BELL. "Pictures and photographs."—May 22nd, 1884.

416 of 1884. G. D. McDUGGALL. "Storing photographic chemicals."—May 22nd, 1884.

#### Patents Granted in America.

374,412. WILLIS G. C. KIMBALL, Concord, N.H., for "Photograph-Burnisher."—Filed April 18, 1887. Serial No. 235,283. (No model.)

*Claim.*—1. In a photo-burnisher, the combination of two hollow rolls open from end to end, gears connecting their journals, standards upon which they are mounted, a crank for



turning the same, and means for introducing heat internally at one end of either roll, substantially in the manner and for the purpose set forth.

2. In a photo-burnisher, the combination of a cleaning-roll, a cloth, felt, or other suitable covering for same, a pivotal frame upon which said roll is carried, the burnishing-rolls, their operating mechanism, and the standard supporting said rolls substantially as for the purpose set forth.

### Proceedings of Societies.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE usual weekly meeting was held on the 29th ult., H. M. STASTINGS in the chair.

Gelatino-chloride plates, printed out, and toned with gold, were exhibited by W. H. PRESTWICH.

H. S. STARNES stated that by a certain treatment, bromide paper could be made to resist the action of sulphuretted hydrogen. He passed round two pieces of a bromide print that had been dipped in a solution of hydrosulphite of ammonia, one of the pieces having been previously treated by his method. The image in this case remained unaltered, while the other piece showed considerable alteration of colour. Mr. Starnes said he was not then prepared to publish the method he had employed, his experiments not being complete.

THE CHAIRMAN exhibited a gelatino-chloride plate that he had intentionally fogged. One half of the plate he had subsequently completely cleared by brushing over it a solution of perchloride of iron, and then dipping the plate in hypo. He also passed round negatives taken by a flashing light. One of these, a portrait, was especially noticeable. This was taken on an ordinary

commercial plate with a portrait lens  $\frac{1}{2}$ , using 5 grs. magnesium with 10 grs. pyroxyline, 10 ft. from the sitter.

J. B. B. WELLINGTON recommended a piece of tin bent round in the shape of a semicircle, and used as a reflector. A greater intensity of light was obtained by this means.

A. COWAN advocated paper in place of the tin; it gave a softer effect.

THE CHAIRMAN said it would be noticed that he had reduced the quantity of magnesium. He had found in using the quantities published that the sides of the reflector were bespattered, which was obviated by reducing the quantity of magnesium. The suitability of different samples of cotton for flashing purposes was then discussed.

This being a lantern night, a large selection of transparencies were projected on the screen. A zoological series in Woodbury-type by F. Haes, from negatives taken by him in 1864 on wet collodion plates, was very fine. Several of the slides were specially interesting, from having been made by the late Mr. Woodbury.

Messrs. L. Medland, F. P. Cembrano, H. D. Atkinson, and J. B. B. Wellington, also contributed transparencies, the collodion-bromide, gelatino-chloride, and gelatino-bromide processes being well represented.

#### NORTH LONDON PHOTOGRAPHIC SOCIETY.

At the meeting held on December 20, at Myddelton Hall, Islington, E. CLIFTON in the chair.

F. W. COX showed a cabinet print with some curious surface markings, which were generally believed to have been caused by splashes of some corrosive liquid.

A. P. HIGGINS showed some negatives which had been spoiled by soot settling upon them, and warned photographers against placing negatives to dry in the presence of London "blacks."

THE CHAIRMAN exhibited and explained Burton's actinometer for carbon printing; the fact of a number of half-tone negatives being used gave a better idea of the progress of printing than a series of flat tints.

L. MEDLAND showed several groups taken by the magnesium flash light. These, though fully exposed, suffered from hardness in the shadows, caused by want of sufficient diffusing and reflecting media. Two ordinary sheets of tin had been used as reflectors, and though intensifying the power of light had failed to secure softness.

W. T. COVENTON passed round some interesting photo-micrographs of the palate of the whelk. He said that they had been taken with an ordinary microscope and camera without any special arrangements, except the removal of the eye-piece. Reflection from the interior of the tube was to be guarded against, as mysterious halos on the plates resulted therefrom.

J. BERD said that a black velvet lining to the tube would effectually absorb all extraneous light.

L. MEDLAND exhibited a Dallastint block which had been used to illustrate one of his articles.

In reply to a question, the CHAIRMAN said the Dallastint process was a secret one, but that very similar results could be obtained by the gelatine process of Herr Pretsch, of which he gave a brief outline.

THE PRESIDENT exhibited a sulphur-toned wet-plate transparency, which, twenty years after production, had preserved all its original beauty. This slide, he said, was only a fair specimen of many in his possession.

W. FEW showed a fine landscape with a group of sheep artistically disposed about the foreground. Great amusement resulted on Mr. Few's pointing out that the sheep were all carefully tied in position.

THE PRESIDENT said that a shrill whistle frequently attracted the attention of animals, and brought them into good position for photographing.

#### CAMERA CLUB.

On Thursday, Dec. 29th, some members met together at the Club, to make experiments in flash light photography. Different proportions of magnesium powder and gun-cotton were tried as against corresponding lengths of magnesium powder blown through a gas jet.

Previous to the meeting Rear-Admiral Maitland handed round some portraits printed on Mawson's opals. These attracted some attention as giving a high gloss, like an ivory miniature, without any special treatment to produce the polish.

HOWARD FINNEY also showed a set of lenses and triple extension lens tubes for the optical lantern by the firm of Wrench



and Sons, enabling the operator to select a suitable lens for any position it might be necessary to place the lantern in.

The meeting on Thursday, Jan. 12th, will be devoted to "Photography and Photogravure," paper by H. Trueman Wood, to be read at 8 o'clock. The subject will be illustrated by examples shown on the Club walls and screens, and by the use of the optical lantern.

#### CHILTENHAM PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting took place on December 5th, at the residence of the Hon. Sec.

The minutes of the previous meeting having been read and passed, Mr. BEETHAM exhibited and explained the working of Thornton's Patent Camera, the various novel arrangements of which were shown.

The numerous paper and film negatives lying on the table were then examined, and questions asked about the exposure, development, &c., of each. The quality of the films was acknowledged to be excellent.

The members present then adjourned to the dark room, where Mr. Beetham gave his promised demonstration of Eastman's stripping films, going through the whole process, from cutting the paper off the roller slide to the final stripping from the glass when dry. Details of the various operations were given as the work proceeded.

The demonstrator stated that he had found the ordinary soda developer, as given in the Company's latest formula, to give the best results, but he preferred to use only 15 grains of soda to the ounce, as he found that quantity gave much clearer and softer negatives than the full quantity of 19 grains recommended by the Company.

At a committee meeting held on December 5th, W. C. Beetham, 22, Promenade Villas, was unanimously elected Hon. Sec. in place of Clifford E. F. Nash, resigned.

### Talk in the Studio.

DECOUDUN'S PHOTOMETER AND THE STEREOSCOPIC COMPANY. Hinton and Co., of 38, Bedford Street, W.C., write as follows:—"Referring to the correspondence which appeared in your columns on the 23rd ult., in connection with Decoudun's Photometer, we deny both the right and the power of any person or persons to monopolize the sale of these instruments; we are selling them on our own terms (see advertisement in this issue), and shall continue to do so under any circumstances. There is nothing to prevent Jack Smith and Bill Jones from laying their heads together to keep a line of business if they can, and to proclaim the arrangement to be a virtuous one; but we fail to perceive the benefit of it to the photographer, or how it can bind those who are not parties to the agreement."

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The usual ordinary meeting of this Society will be held on Tuesday next, Jan. 10th, at 8 p.m., at the Gallery, 5A, Pall Mall East, when Mr. Donkin will make some observations on "Stereoscopes and Binocular Vision," and will show a Wheatstone's reflecting stereoscope. Members are requested to bring stereoscopic views, especially any of large size, for the reflecting stereoscope. Bromide enlargements from stereoscopic negatives, of any size up to 10 or 12 inches, are very suitable.

PAPERS STANDING OVER.—Among the interesting matter in type, but standing over, we may mention a discourse on "The Shortcomings of Photography in Relation to Art," read by John Bartlett before the Photographic Society of Philadelphia; a paper by Ives on the "Ethoxy Limelight," and "Intensification," by Howard Farmer.

BURTON'S HANDBOOK ON PRINTING.—This is now published, and can be had from Marion and Co., price 4s., and we should have reviewed it this week had not the copy sent us by the publisher been misdirected, and consequently gone astray; but we hope to say something about it in our next.

COMMERCIAL EXAMINATIONS.—The Council of the Society of Arts have had for some little time under consideration the question of modifying or enlarging the system of Commercial Examinations, which have now for many years been carried on by the Society, in view of the recent demand for improved commercial education. The experiment of holding examinations simultaneously at local centres was first tried by the Society of Arts in 1856, and the principle has since developed into the

Examinations of the Science and Art Department, the Oxford and Cambridge Locals, &c. During the thirty years that these examinations have been carried on the system has undergone various modifications. At present, examinations are held in subjects covering pretty much the same ground as that defined in the new scheme of the Oxford and Cambridge Local Examinations, but certificates are awarded in single subjects, not on the general result of the examination. For some years the experiment of awarding general commercial certificates, instead of the separate certificates, was tried, but was found less satisfactory to the candidates generally. Before deciding on any course of action the Council have submitted a draft scheme to the Examination Boards in union with the Society of Arts, and are awaiting the result of their inquiries before making any public announcement. In any event it is not likely that the system of separate certificates will be abandoned, though it is not improbable that it may be supplemented by the issue of general commercial certificates either on the result of the present examinations, or of examinations to be specially held. The Society has already received a promise of £100 for a travelling scholarship from the Clothworkers' Company, and it is hoped that further assistance may be received of the same kind. The objects of these travelling scholarships is, of course, to enable the holder to acquire that practical knowledge of foreign countries which can only be attained by actual residence abroad. *Standard.*

PHOTOGRAPHIC CLUB.—The subject for discussion on Jan. 11 will be "Defects in Gelatine Plates."

### To Correspondents.

\* \* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

SOLAR RADIANCE.—1. Thank you for kind wishes, and we quite agree with you that something more permanent than that which you mention is desirable. 2. The publishers inform us that besides the current YEAR-BOOK, the following can be obtained from them:—1886 and 1887.

J. C. S.—It is very good of you to send the details.

C. C. V.—Although we sympathise with you in your sufferings, we cannot agree with much that you say.

THOS. D. ARNOTT.—The letter has been forwarded; his address being "Camera Club," 21, Bedford Street, Strand.

TYRO.—Have you not written to the wrong person?

K. PAUER.—We know of nothing better for the purpose than hydrofluoric acid. If the film does not separate at once, use the acid a little stronger.

S. E. KELF.—Please send your address, so that the publishers can send you a contributor's copy of the YEAR BOOK.

A. PARKER.—See notice to S. E. KELF.

C. H. BOTHAMLEY.—1. They were posted before the receipt of your letter. 2. We will make enquiries, although we fear it will not be easy for us to obtain specimens illustrating this particular branch of photography.

S. G. H.—We are much obliged to you for doing as you suggest with the extra copy.

C. H. LEWIS.—1. It should be ferricyanide in both cases. 2. We think not. 3. Surely if it is strong enough! This satisfactory result would, in all probability, not have been obtained if the operation had been put off much longer. 4. Certainly; but either dilute cyanide or the ferricyanide mixture would probably answer. 5. Virtually this point is answered under the previous heading: it is, however, a safer thing to treat with hyposulphite in the first place, wash, dry, and make a transparency, so that if the more drastic measures prove destructive to the negative, there is something to fall back upon.

W. E. DEBENHAM.—Thanks. We have made a guess at the word, and posted it to you.

JOHN MILNE.—The book is not an expensive one—certainly not more than half-a-crown—and we will post you the exact address of the publishers.

A. E. OAKES.—1. A bath made slightly acid, and old collodion should be used. 2. Iron developer, and no intensifier will be needed. 3. Ordinary albumenized paper. 4. Only floated. 5. Between 45 and 50 grains.

J. T. ATKINSON.—Your letter, like the former one, has been handed over to the publishers, in whose department the matter is.

HAROLD SENNER.—Received, but too late for this week.

B. J. EDWARDS & Co.—Your letter to hand, and it shall appear next week.





# THE PHOTOGRAPHIC NEWS.

Vol. XXXII. No. 1562.—January 13, 1888.

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### PIZZIGHELLI'S DIRECT PLATINOTYPE PROCESS.\*

#### SECOND METHOD.

In this method, the sodium oxalate—in fact, the developing agent—is not added to the iron solution, but mixed with the arrowroot used for sizing; and the arrowroot paste used has the following composition:—

Arrowroot ... ..	2 parts
Sodium oxalate solution containing 3 per cent. ... ..	100 „

The method of coating the paper with the starch paste is the same as already described.

*Sensitizing the Paper.*—The solutions A, B, C, and D, used, have the same composition as in the case of the first method, only the iron solution B is made up with water instead of with ferrous oxalate solution.

In order to prevent mistake, the series is given below as

A<sub>2</sub>, B<sub>2</sub>, C<sub>2</sub>, and D<sub>2</sub> :—

A <sub>2</sub> .—Potassium chloroplatinite... ..	1 part
Distilled water ... ..	6 parts
B <sub>2</sub> .—Sodium ferric oxalate ... ..	40 parts
Distilled water ... ..	100 „
C <sub>2</sub> .—Iron solution B <sub>2</sub> ... ..	100 parts
Potassium chlorate ... ..	4 „
D <sub>2</sub> .—Mercuric chloride solution (3 per cent.) ... ..	20 vols.
Sodium oxalate solution (3 per cent.) ... ..	40 „
Glycerine ... ..	1·8 „

The general directions as to the series A, B, C, and D, apply equally to the preparation and use of the series A<sub>2</sub>, B<sub>2</sub>, C<sub>2</sub>, and D<sub>2</sub>.

#### THIRD METHOD.

This method is a simplification, as the sizing of the paper is not a separate operation, the thickening material being mixed with the sensitizing preparation. For this method, four solutions, which are designated A<sub>3</sub>, B<sub>3</sub>, C<sub>3</sub>, and D<sub>3</sub>, must be prepared, and the composition of these solutions is as follows :—

A <sub>3</sub> .—Potassium chloroplatinite... ..	1 part
Distilled water ... ..	6 parts
B <sub>3</sub> .—Sodium ferric oxalate ... ..	40 „
Powdered gum-arabic ... ..	40 „
Solution of sodium oxalate (3 per cent.) ... ..	100 „
Glycerine ... ..	3 „

To prepare B<sub>3</sub>, the sodium oxalate solution is first heated to 40° or 50° Centigrade, when the iron salt and glycerine

are stirred in. After the former is completely dissolved, the solution is transferred to a mortar, when the gum is gradually added, and thoroughly incorporated. This being done, the mixture is allowed to stand at rest for some hours in order that small agglomerations of gum may thoroughly dissolve, after which the whole is again incorporated, and then squeezed through a cloth.

C <sub>3</sub> .—Iron and gum solution, B <sub>3</sub> ... ..	100 parts
Potassium chlorate ... ..	0·4 „
D <sub>3</sub> .—Mercuric chloride solution (5 per cent.) ... ..	20 parts
Sodium oxalate solution (3 per cent.) ... ..	40 „
Powdered gum-arabic ... ..	21 „
Glycerine ... ..	1·8 „

Solution D<sub>3</sub> is mixed in a similar way to that recommended in the case of B<sub>3</sub>.

The proportion in which A<sub>3</sub>, B<sub>3</sub>, C<sub>3</sub>, and D<sub>3</sub> are to be mixed for use are analogous to those of the first method; and the following may be mentioned as suitable for black images under ordinary conditions :—

A <sub>3</sub> .—Platinum solution ... ..	5 c.cm.
B <sub>3</sub> .—Iron and gum solution ... ..	6 „
C <sub>3</sub> .—Gum and chlorate solution ... ..	2 „

When, however, sepia-brown images are required, the following may be used :—

A <sub>3</sub> ... ..	5 c.cm.
C <sub>3</sub> ... ..	4 „
D <sub>3</sub> ... ..	4 „

The application of the mixture is made with the brush according to the instructions already given, and during the application numerous small bubbles are formed; but these can be disregarded, as they disappear completely when the coating is smoothed with the badger softener. The gum layer dries with a slight gloss, but no special precautions are necessary in drying.

It should be mentioned that the third method appears to be, on the whole, the most convenient, and the most worthy of recommendation.

After drying, the paper should be preserved in the chloride of calcium box, but the paper prepared as now recommended seems to be far less prone to alteration than that prepared by the older methods, as specimens kept for ten days without any special precautions gave results quite as good as those obtained on paper which had been kept in the chloride of calcium box.

Nothing very special is to be said about the printing, except the action of light must go on until the image shows

\* Continued from page 2.

the intensity it should have when finished—in short, there should be no over-printing.

The printing being finished, the paper is immersed in the following:—

Hydrochloric acid	...	...	...	1 volume
Ordinary water	...	...	...	80 volumes

This solution is changed two or three times—in fact, until it shows no further trace of yellow colour—after which there is nothing to be done but to wash the platinotype print in water, and to dry.

Under-printed images may be developed in a cold solution of sodium or potassium oxalate; and, in conclusion, it should be mentioned that the iron salt in the solid form, as also its solution and the mercuric solution, should be kept in the dark.

## A SYSTEM OF INTENSIFICATION.

BY CHAPMAN JONES.

THERE have been many methods for the intensification of gelatine negatives proposed from time to time, and though these methods produce each of them a different amount of strengthening, I do not know of any successful attempt to devise a system of intensification.

It has already been pointed out that any process of intensification must be thorough, unless the negative is at fault in its gradation and is therefore to be benefited by an unproportional effect. Intensification, pure and simple, should increase the opacity of the whole negative without changing the ratio of opacity that exists between any two parts.

Having this end in view, those methods where the effect increases to a maximum, and then, without change of the reagent, begins to die away, must be rejected as uncertain. It has been stated that the mercury and sulphite process is one of these, that the sulphite of soda reduces when intensification is complete; but this statement is apparently only to be explained on the supposition that the process was not properly carried out—perhaps the sodium sulphite used was not acidified. One must also avoid using one method of intensification only, stopping the action when it has apparently gone far enough, for the reasons given above. Such procedures are good sometimes for special effects, but unless the operation is carried out wittingly and for a special purpose, the negative may be injured rather than improved.

In a system of intensification there must be a series of operations by which one can with certainty get a number of grades of intensification; and it will obviously be advantageous to be able to proceed by degrees. By adopting certain well-known methods and adding to them the action of mercuric chloride, followed by ferrous oxalate, I have been able to formulate such a system. In the following series of operations, each change is supposed to be thorough—that is, that the change of colour in every case shall be visible clearly at the back of the plate in the densest part of the negative. The results are given only in general terms, because it does not appear to be either useful or scientifically interesting to be able to make more exact statements.

1. Mercuric chloride followed, after well rinsing, with sodium sulphite, gives the little addition of brilliancy sometimes wanted in a carefully made and successful negative.

2. Mercuric chloride on the original negatives, followed, after thorough washing, by ferrous oxalate, gives about as much increase of density as compared with number 1, as number 1 gives when compared with the original negative.

3. A repetition of the application of mercuric chloride and ferrous oxalate—that is, these reagents applied to the result of number 2—gives another step in the intensification. *Note.*—The result of this treatment is about

equal to the action of mercuric chloride followed by ammonia upon the original negative.

4. The result of number 3 may be treated again with mercuric chloride and ferrous oxalate, and so on as may be necessary.

5. The fourth or fifth consecutive application of mercuric chloride and ferrous oxalate will probably give a result about equal to that of the uranium intensifier acting upon the original negative—that is, the single application of a mixture of uranium nitrate and ferricyanide of potassium.

6. If a still greater effect is desired, the lead intensifier of Eder and Toth may be used on the original negative, following the lead nitrate and ferricyanide of potassium with a very thorough washing (until the washing water gives practically no blue colour with a solution of ferrous sulphate) and then with ammonium sulphide. The ammonium sulphide should be watched, as it is likely to cause frilling.

7. And lastly, the effect of the lead intensifier may be increased in the proportion of three to four by the application of cadmium sulphate before the ammonium sulphide, but with a thorough washing at each stage of the operation.

Those methods numbered 6 and 7 are practically useless in the treatment of half-tone negatives, because the result is so very great; and number 5, the uranium formula, is only needed when the negative has a mere ghost of an image upon it. It may be noted that the uranium intensifier is as effective on the mercury image resulting from the treatment described under number 1, as upon the original negative; but I do not know of any less vigorous reagent that will follow the result of the mercury and sulphite, and produce an undoubtedly permanent result.

Those operators who are accustomed to use the mercury and ammonia method, and find that it is sometimes too vigorous, can retain the use of this intensifier when required; but for milder effects, use the first or second method described, and so have three grades of intensification, each needing two solutions only. But those who prefer a result that they can confidently regard as permanent, may reject the mercury and ammonia altogether, and get about an equal result, and one that is as amenable to intensification as the original, by following the methods given above.

The chemical effect of the ferrous oxalate upon the image bleached by mercuric chloride is to reduce both the silver and the mercury to the metallic state, so that the original silver remains with the added mercury; while the sodium sulphite reduces the mercury but dissolves away the chloride of silver, and the ammonia also dissolves the chloride of silver and changes the mercury compound into a black compound, or a mixture of black compounds of mercury.

The following solutions are recommended for the methods given:—

*Mercuric Chloride.*—A saturated solution in cold water with one or two drops of strong hydrochloric acid per ounce.

*Sodium Sulphite.*—One ounce in ten ounces of water, with sufficient of a concentrated solution of citric acid to produce a slight acid reaction.

*Ferrous Oxalate.*—One ounce of a saturated solution of ferrous sulphate with one drop of strong sulphuric acid, poured into six ounces of a saturated solution of potassium oxalate after making the potassium oxalate solution slightly acid by shaking it with very finely powdered oxalic acid, added a little at a time. Then add three or four ounces of water.

*Uranium Intensifier.*—Uranium nitrate, four grains to one ounce of water. After soaking the plate in this, mix the liquid with a dilute solution of potassium ferricyanide made by running water over a few crystals to wash them, and then shaking them with a dram or two of water for a few seconds. Add more ferricyanide as necessary.

*The Lead Intensifier.*—Lead nitrate, 20 grains; ferricyanide of potassium, 30 grains; distilled water, one ounce; and filter. Follow, after thorough washing, with ammo-



nium sulphide in ten times its bulk of water. The cadmium sulphate solution may be fifty grains to the ounce. Only distilled water should be used with this intensifier.

If distilled water is not at hand for use in the ferrous oxalate method, the well-known milky appearance due to oxalate of lime may be expected in the solution and on the negative; but although this deposit on the negative is not pleasant to look at, it does not seem to affect the printing.

### FRENCH CORRESPONDENCE.

PHOTO-STENOGRAPH—DIRECT CONTRETYPE—ENDLESS PELICLE—PHOTO-COLLOGRAPHIC AUTOCOPYING—ELECTRIC MEGASCOPE—UNIVERSAL EXHIBITION—SYNDICAL CHAMBER OF PHOTOGRAPHY—NEW PHOTOGRAPHIC PUBLICATIONS.

*Photo-Stenograph.*—M. Sermasse has had the happy idea of making a small apparatus adapted for easily realising photography without a lens. It is, in the first place, something which bears every resemblance to a lens, but with this difference: that the lens is replaced by a hole of about three-tenths of a millimeter, at the end of a blackened cone. This apparatus is placed on the camera front, just as a lens is placed. The length of exposure varies with the focal distance with which one is working, and with the sensitiveness of the plates employed. About thirty seconds are given with a focal distance of from ten to fifteen centimeters, and with plates of moderate sensitiveness. It has been objected to M. Sermasse, that the use of a simple plate pierced with a hole would, while costing nothing, do instead of his photo-stenograph. To this the author of the apparatus might reply that the arrangement adopted by him serves as a sky shade and sun-screen around the hole. The flange into which the appliance is screwed serves to allow of it being easily fixed with the help of three screws on a camera front ready for use at any time, whilst without it everything has to be done. As to the results, they are evidently not equal to those produced by a photographic lens. There is always a certain want of sharpness, which is due to the diffraction of the rays of light which pass through very small apertures. Nevertheless, for views from nature, and the reproduction of monuments, images obtained in this manner may have sufficient sharpness to serve as satisfactory souvenirs. The carriage of such an apparatus does not differ from that of a lens. The balance of advantage, then, is evidently in favour of the latter, but we must not forget that with the photo-stenograph no focussing is required, there is no distortion, and that images of different dimensions may be produced, simply by increasing or diminishing the focal distance. It offers us the means of producing certain results which the lens with which we may be provided will not give. It is obvious that in the present state of sensitiveness of our plates, we cannot hope to obtain rapid exposures, but this is an inconvenience of little importance when the reproduction of buildings or monuments is in question.

*Easy Production of Direct Contretypes.*—A fact which has been published now for some years—i.e., the possibility of obtaining direct contretypes, or negatives from negatives, without the necessity for making a positive—has remained, at all events for the majority of photographic adepts, without being practically employed. This process was indicated in 1882 by Capt. Biny, but it is still older than that. The plan is as follows:—An emulsion plate (or, better still, a pellicle or paper coated with gelatinobromide of silver) is taken and immersed in a 2 per cent. solution of bichromate of potash. After a stay in this bath of from five to ten minutes, the film is rapidly rinsed with water and placed to dry. It is of little consequence whether the plate has, or has not, been exposed to light before being placed in the bichromate bath. The drying of the plate does not require to be done in the

darkness of an ordinary coating room; it is sufficient that there should not be enough light to decompose the bichromate of potash. The film, after being thoroughly dried, is exposed to daylight, direct or diffused, behind the negative which it is desired to reproduce. The negative and film are exposed in a press, which is firmly screwed up, so as to insure immediate contact of the two surfaces. If, as is to be preferred, a pellicle or paper is used, the course of the printing may be watched by opening the back of the press and examining the image, which is formed in brown oxide of chromium. When it is quite complete—when all the half-tints of the original negative show as thoroughly printed—the exposure is stopped, and development is proceeded with in a bath of ferrous oxalate. This development may be conducted in open daylight, and it is stopped as soon as the contretype has attained the desired depth. It may thus be made to surpass the original negative if this has been too dense or too weak. Thanks to this process and to the employment of pellicle, contretypes may be obtained which it is difficult to distinguish from the original negative. This process offers many advantages. In the first place it allows us to obtain reversed negatives suitable for the photo-mechanical processes, such as collotype, heliogravure, &c. Next it enables us to multiply negatives for commercial purposes, when it is desired to print from several plates at once. Finally, thanks to this process, we may preserve the original negative as a matrix, and by only printing from the contretype we may preserve the original negative from the risks of printing. By using papers with reversible pellicles we can, according to our requirements, print from either the one or the other side of our contretypes. This constitutes a very great advantage. If this curious process did not at once attract the attention which is accorded to it at the present day, it was because plates, and not pellicular films, were in use at the time that it was introduced. We are struck with the interest with which the introduction of pellicles has invested this process, which is so easy to work, and with which results as perfect as possible are obtained.

*Endless Pellicle of M. Alex. Nowicki.*—M. Alex. Nowicki has found the means of manufacturing an endless pellicle of very great length. The bands which we have seen are 3 metres long, but he says he can make them from 8 to 10 metres; all depends upon the height of the apartment in which he may organise his factory. This pellicle, translucent as glass, is formed with a sort of collodion, the thickness of which is variable at will, and is very regular. To coat it with emulsion it is plunged in the liquid, which covers it on both sides. It behaves very well in the water, in which it does not suffer any deformation. We have been shown a band 3 metres in length developed with images throughout, without the different images having been separated. Naturally a roller slide (Eastman) was used to obtain the successive impressions, then all the band was folded several times upon itself, and placed in the developing bath. It is certain that the manufacture of such a pellicle constitutes an important progress, and one which will considerably facilitate the employment of roller slides.

*Photo-Collographie Auto-Copying.*—The production of collographic impressions upon flexible supports has, in the hands of M. Raymond, made important progress. He has succeeded perfectly in producing upon sheets of parchmentised paper, covered with a film of bichromated gelatine, collotypic images as finely modelled as those which are obtained upon rigid supports, such as glass or plates of copper. The parchmentised paper is prepared beforehand with a film of gelatine. It is sensitised over night, when required, by immersion in a bath of bichromate of potash at 3 per cent. The paper on coming out of this bath is placed wet, with the gelatine side downwards, against a talced glass. The excess of liquid is removed by the aid of a squeegee, and it is allowed to dry. After drying, the sheet easily abandons its provisional support. It is then



printed in the ordinary way in a plate glass press, then the sheet is stretched upon an autocopying machine. To do this the back of the gelatined paper is moistened with a sponge, or, better still, it is placed in water, where it loses all the excess of bichromate. When stretched upon the auto-copyist it is allowed to dry as much as desired, and then printed from. We must not omit to say that after the printing in the glass press, the back of the sheet is exposed to the light to harden the back of the gelatine, and to render the printing surface at the same time finer and more solid. The pressure of an ordinary copying press suffices for producing the proofs. The specimens shown by Raymond leave nothing to be desired. It has been objected that this process is not so simple as stated, and that a certain apprenticeship is necessary. Strange observation! As if everything that we wish to do well does not require to be learned, and does not require a certain amount of experience.

*Electric Megascopes of M. Trouvé.*—A well-known electrician, M. Trouvé, has just created a new apparatus for the projection of images produced from opaque surfaces. This megascope is illuminated by an electric light due to an incandescent lamp placed in front of a reflecting mirror. The electricity is furnished by a small bichromate pile. The luminous rays are thrown upon the opaque object of which an enlarged projection is to be made, and in front of which a lens is placed, which throws the image, more or less enlarged, upon a screen. M. Trouvé's actual model has not been constructed with a view to photographic application, but with some little improvement—furnishing it with a condenser, and with a rack and pinion for focusing—the instrument may be made fit for direct enlargements without the necessity of working from a transparency. Moreover, for projections during the course of a demonstration, the lecturer may easily, with the apparatus at hand, pass successively through the slide any opaque images to be projected in front of him, and in face of his audience, on a semi-opaque screen. The journal *La Nature* has recently published drawings which give an exact idea of this ingenious apparatus.

*Universal Exhibition.*—The demands for space at the Universal Exhibition of 1889 continue to flow in. The total space asked for amounts to at least double that which has been placed at the disposal of the committee of installation. It is not as yet exactly known what proportion will be allowed to foreign nations. It is probable that the private exhibits will be numerous, in spite of the refusal of official co-operation by the greater part of the monarchical nations. We certainly hope that it will be so.

*Elections in the Syndical Chamber of Photography.*—The Syndical Chamber of Photography has just re-established itself for the year 1888. It has elected M. Leon Vidal president, MM. Block and Bertrand vice-presidents, MM. Cheron and Mieusement secretaries, and M. Carotte treasurer. At such an important time as the preparation for the Exhibition of 1889, the part which the Syndical Chamber is called upon to play is very important. This professional association is, moreover, in course of transformation. It is being organised in such a way as to greatly increase the interest of its sittings, and to lead to the adhesion of many fresh members.

*New Photographic Publications.*—Amongst the new publications which have recently appeared we have to notice *La Photographie Moderne* by M. Albert Loude (Librairie Masson). This work is well illustrated, and includes vignettes relative to the photographic art which have been published in *La Nature*. The text by M. Loude is very instructive and well written. Moreover, there are in the work two beautiful collotypes, one by MM. Bertrand Bros., and the other by M. Balagny. A fine photographure comes from the atelier of MM. Lumière, at Lyons. The library of Gauthier-Villars has, conjointly with that of M. A. Hoste, of Ghent, edited an elementary treatise of photography by M. T. Martens. Divers other works are in preparation at the library of M. Gauthier-Villars; they are the

second volume of the "General Treatise on Photography" by M. Davanne, a "Treatise on Photographic Enlargements" by M. Leon Vidal, a new edition of the manual of the "Photographic Tourist" by the same author.

LEON VIDAL.

## THE SHORTCOMINGS OF PHOTOGRAPHY IN RELATION TO ART.

BY JOHN BARTLETT.\*

THE ideal, not the literal rendering of nature, is generally accounted the peculiar function of art; but, the truth is, the ideal of the greatest painters and sculptors is not far removed from the matter-of-fact.

The superb horses of the Elgin marbles are almost fac-similes of beautiful living specimens. Doubtless the gods and heroes approximated human forms, inasmuch as the Greeks had ample opportunity for comparison, denied us by the exigencies of modern life, which compel us to keep our shapes of beauty swathed in thick garments.

The true ideal is not something removed from nature, but the expression of the taste in selection and combination of familiar things, and the closer the artist clings to objective realities, the greater is his work accounted. Now, it is sometimes claimed for photography, by its over-zealous champions, that its intense realism in the translation of the external world is a strong argument in favour of its art status.

To be consistent with the definition of idealism, one might be willing to admit that a subject happily selected by the camera directly from nature would entitle the photographer to the credit due to invention, inasmuch as the mere faculty of inventing a subject does not demand so quick and keen a perception of the beautiful, as the discovery in nature of what is just suited to the purposes of art, which escapes the observation of ordinary people.

But one cannot consistently affirm that the pencil of light does faithfully translate nature upon the sensitive film; that is, nature as presented to our normal vision.

If we lay aside the grave charges hitherto brought against photography of falsifying nature, in the incorrect rendering of colour into monochrome—a fault which the orthochromatic processes are fast correcting—still we shall have to admit that in the disposition of light and shade there is a difference between the photograph and the painting, a difference which justifies the painter's method rather than the photographer's.

Let us examine a painting and a photograph of the same subject, a high tower or steeple against a clear bright sky.

In the photograph we shall see that the upper part of the tower or steeple is in much stronger light than the bottom, whilst in the painting or engraving, the higher part is darker than the lower.

Now, which is correct? Does it not stand to reason, that a high tower against a cloudless sky receives greater illumination at the top in the broad expanse of light, than at the bottom, just as the photograph renders it?

Does the painter then violate nature to create artistic effect? Surely his method is the more pleasing and picturesque, but how can it be contrary to nature and yet true and beautiful?

One cannot conceive how any such glaring violation of nature can result in artistic pleasure, how a method seemingly so opposed to common sense, and apparently so out of harmony with the actual order of things, can be justified; and yet, justice must give the verdict for the painter.

Art must represent nature as it is presented to our senses, not as things actually are. But why does the high tower against a cloudless sky show the upper part dark, to our vision? We must have recourse to a physiological reason for an explanation.

There is a peculiarity of the retina which shows itself, when we exercise the eye, and which has its influence in works of art. If we place a bright silver coin upon a dark table and centre the eye upon it for a few minutes, when we remove the coin for an instant there is a white spot in its place, which almost immediately becomes black.

If a red wafer placed upon a sheet of paper is looked at intently, on removing the wafer the spot will appear green. If we look upon a yellow wafer, on removal it will seem blue, the complementary colour always showing itself. This phenomenon is explained by supposing the nerve to be so exhausted by the

\* Read before the Photographic Society of Philadelphia.



continued action of the special rays, that it momentarily becomes insensible to their influence, and the effect of the rays of an opposite kind only is transmitted to the brain. Let us see now how this sensibility produces an effect where there is, strictly speaking, no colour, but only light and shade, as in the case of our tower against the sky. We know the highest part of the tower is in the brightest illumination, yet we do not actually so see it. It never so appears to our eye. The reason is obvious: when we look at the steeple or tower, a great part of the retina is opposed to the light of the sky, and on shifting the eye to any particular part, the light which is reflected from that part falls upon the retina where it has been exhausted by the direct light from the sky, and consequently that part appears dark.

A very simple way of convincing oneself of this peculiarity of the retina is to look intently for a minute at an open window in a room, and then direct your eyes to the wall: the panes will look dark, while the mullions look light.

Painters take advantage of this peculiarity of the eye. They create an effect not only by the contrasts of lights and shades, but also by contrasts of colours. The bright carnations, for instance, which in themselves would be glaringly offensive, even painful to the eye, are softened down from their exaggeration by some contiguous colours which catch the eye, affect the retina, let us say tire it first, so that the two impressions together produce a harmonious effect, which seems natural, although it actually is not so. If the colouring of a picture be too warm, with subtlety of art the painter introduces some colour, which, rendering the eye insensible to the red and yellow rays, increases the susceptibility to the blue and violet rays. Every ray of the warm red is actually transmitted to the retina, but the impression is modified by the colder colours, a portion of the red is for a moment lost, and the picture appears less warm, because the opposite rays have prevailing influence. We never really see all the colours in their actual degree of intensity at the same time when placed together. The eye alternately shifts from one to the other, and there is a modification of all. This is the harmony the painter strives after. It is art, and it is at the same time truth to nature. When we look at a beautiful landscape we do not actually see the colours as they are transmitted by vibrations to the nerve of the eye. No one who desires to enjoy a lovely prospect ever fixes his eye intently upon any individual portion of a scene to the exclusion of all the rest, but the eye wanders over the beautiful prospect, and returns as from a delightful excursion. It receives a multitude of varied and modified impressions, and the result is a pleasing picture, just such as the painter depicts upon the canvas, only infinitely more beautiful.

If any argument were needed for the beneficence of the Creator, this physiological peculiarity, this optical imperfection, might be cited in evidence rather than the eye's perfection as an optical instrument as advanced by the school of Paley; for on it depends our æsthetic pleasure in landscape.

For rendering of form the human eye, guided by the most delicate touch, cannot approach the pencil of light, yet from the tribunal of art, judgment must often be pronounced against photography, and the book of the law is again the limitation of our vision.

Instantaneous photography has yielded marvellous results to science. For the mathematician it has verified the direction of the curve of projectiles; to the physiologist it has revealed the curious muscular contortions assumed during animal locomotion; but instantaneousness is generally destructive of art.

Painters do not paint animals in motion in the attitudes Mr. Muybridge has demonstrated to be the actual truth. The painter prefers reality as it presents itself to our visual sense to reality as it is. The law of the persistence of vision must not be violated.

It has been clearly demonstrated that the image impressed upon the retina remains there an appreciable space of time, consequently objects, though passing continuously through an unbroken series, seem to the eye to remain unchanged. Instantaneous photography, by isolating any special movement in the series, really destroys the whole idea of motion.

To compel the artist to represent arrested movement—an actual momentary attitude—because he has to do with a single moment of time in his representation, would be about as wise as to force him to confine himself to the use of those colours only which do not harmoniously modify each other when in juxtaposition, though science can readily prove the isolated existence of the three primary colours in their integrity.

Lessing, in his critical essay, "The Laocoon," tells us:—All appearances of nature, which in their actual state are but of an instant duration, which can be what they are but for a moment—all such appearances, be they pleasing, or be they horrible, receive through the prolonged existence which art gives them, a character so contrary to nature that at every repeated view we take of them the impression becomes weaker and weaker, till at last we turn from the contemplation in weariness and disgust.

La Mettrie, who had himself painted and engraved as Democritus the laughing philosopher, laughs only the first time we look at him. Look at him often, and the philosopher is converted into a buffoon, and his laugh into a grimace."

This is the impression conveyed by many an instantaneous photograph, because it represents the person, as it were, petrified in the transient state, fixed for ever in a position which could not be preserved for more than a single moment. By its scrupulous adherence to reality it takes away the very appearance of reality, motion, life, action.

The greatest painters have devoted their attention to this simulation of motion in their pictures. Rubens was pre-eminently successful in giving action to his figures.

Fuseli describes the elements of his pictures as "swept along in a gulf of colours, as herbage, trees, and shrubs are whirled, tossed, and absorbed by an inundation." There is a picture of his representing a rustic wedding, filled with figures—dancing, romping, and rolling on the ground; a wonderful display of varied attitudes which creates in the beholder the idea of motion in a masterly manner.

## HUNTING AFTER PORTRAITS.

### THE EXPERIENCES OF A JOURNALIST.\*

"This lightning sketching is all very well when you have a fair look at a face," said Easel one day at the conclusion of a disappointing hunt after some celebrities in a building where the sight of a pencil used by either one of us would have ensured our ignominious ejection, "but it's deuced unsatisfactory and uncertain. I wonder whether we could use the camera?"

I was rather bitten by the idea, not that photography would have been available in the present instance, but because a new phase of "portrait hunting" was contemplated where it seemed possible the camera might be introduced. We had come to the conclusion that the plan hitherto adopted of snatching a portrait by stealth was all very well when a certain amount of caricature was admissible, but was not the best when a good likeness was wanted. A sort of quasi-arrangement had been made in a few cases by which we were to call upon the notability, and while I conversed with him in the seclusion of his office and extracted as much information as I could for biographical purposes, Easel was to sketch his features. What could be easier, we both agreed, than take down a camera and a few dry plates and photograph the men instead of sketching them?

Accordingly we determined to make the experiment. Easel had the orthodox amateur's outfit, light, handy, and portable. The lens was a single landscape, but we thought if the light were at all decent, we should get "something." There is much virtue in a "something," I have noted, among artist-photographers. If there is only a ghost of an image, they are satisfied, hoping to make up all deficiencies with the pencil. Consequently we hadn't much doubt that, though orthodox printing negatives might be unlikely, yet we might obtain a sufficiently reasonable nose, not more than two pairs of eyes, and something which would resemble a mouth.

It was a morning in the late autumn. I had impressed upon Easel the necessity of being early, and punctually at half-past ten I arrived at the place of appointment in the city. I was armed with a crimson umbrella tent, because we hoped to catch at least three sitters, and the tent was necessary for changing the plates. And here let me say that admirable and convenient as is this tent, I have a

\* Concluded from page 724.



grievance against it, or, rather, the cardboard box in which it is packed. In the first place, to squeeze the tent into its receptacle is a most irritating operation. After having coaxed the ribs and the red twill into something like obedience, you find the india-rubber tube has turned refractory, and absolutely refuses to allow the lid of the box to be put on. If you don't lose your temper, and jam the whole thing in violently to the destruction of the box, you must get someone to hold down one end of the lid while you gently persuade the unruly tubing to lie quietly and peacefully. But this is not my main grievance. What I complain about is the colour of the box outside. It is of a horribly obtrusive, staring red, while the lid itself is yellow.

That the umbrella itself is red is unavoidable, I suppose; but why the box which holds it should be red also I cannot understand. After I had got the lid on, and secured by a piece of string, I looked at the arrangement, and at once decided that I could not possibly carry a red and yellow box three feet or so long, and five inches square, through the city during its busiest hours. It must be packed in paper. Now mine is a household which rarely contains a sheet of brown paper of respectable size, and I believe my experience is a common one. After a hurried search, a torn strip was found sufficiently large to cover up the lid and sides, but it refused to hide the bottom; but as this was itself brown, I was contented. At the same time, it seemed a needless waste of time and temper to be obliged to pack the box up at all, when, had it been of a reasonable colour, a strap or string would have sufficed alone.

This, of course, is a digression, but I mention it because it seriously interfered with the calmness and placidity of mind with which one should always start on a photographic expedition. Armed with this untidy parcel, I sauntered up and down in front of the Royal Exchange, inwardly anathematising Easel, for eleven o'clock had arrived, and he had not made his appearance. It was fairly fine at half-past ten; at eleven murky clouds had gathered; at half-past eleven, when Easel turned up, the light was dull and lifeless.

"We shan't do much good, I'm afraid," said I, doubtfully.

"Well, we may get sufficient to work upon," returned Easel, hurriedly. "Let's look sharp and work off the first man."

Easel, I noticed, did not appear to be comfortable. He had the camera legs folded and strapped in one hand, and a big leather bag in the other. It was a new experience. Carrying photographic apparatus in the country was one thing, in the City of London another. The conjunction of the abominable box was also trying. As a large patch of red showed through a hole in the paper, I tried to carry it so as to conceal the conspicuous hue, but to no purpose—it persisted in making itself visible. We both breathed a sigh of relief when, after much jostling by excited and hurrying stockbrokers' clerks in Throgmorton Street, we got to our destination.

"It's pretty near the sky," I exclaimed, after we had mounted four pairs of stairs; "we shall get all the light we're likely to have."

Easel smiled a sickly smile in response. It was clear he was beginning to funk the impending test of his photographic knowledge, which had hitherto been confined to taking over-exposed pictures of his relatives in his back garden.

We were shown into the office, and the first words of the notability rolled a hideous load of responsibility off our shoulders.

"I thought, perhaps, you'd like a photograph, so I've brought one," said he. Beneficent being! We must have surprised him by the warmth of our thanks. We had begun secretly to despise our impudencia even so soon as we descended those four flights of stairs, but neither would confess to each other the fervent hope that we

mightn't be called upon to use it, and we went bravely to our next sitter. This gentleman had an office in a dark narrow court on the ground floor, and the light was about equal to that of the ordinary pantry. Here we had quite a new experience—an experience which has been repeated many times since. The notability was coy, rethling, modest. He could not possibly conceive why we should want his portrait. What was the use of taking the likeness of such a plain-faced man as he? His friend sitting in the chair was a good-looking fellow—why didn't we take him? All these protestations being accompanied by a sort of half laugh and a furtive look in the eye which told us plainly that if it had not been for the presence of the friend he wouldn't have had the slightest objection.

This friend, who proved to be the late partner of the man whose portrait we wanted, had a fine head, but a most objectionable manner.

"I think this practice of publishing portraits in newspapers most improper," said he, pompously.

"Indeed," was my reply; "but at any rate you will admit that if a portrait is published it should at least be like the original. Now it would have been an easy matter to have sketched Mr. — in the street, but we preferred to give him the opportunity of seeing himself represented under favourable circumstances."

"Then, sir, do I understand you sketch people's features and publish them without their permission?"

"Certainly, if we think our readers take an interest in the man whose portrait we give."

"Then," said this individual, more pompously than before, "I say it is very wrong."

Into the ethics of this question we did not enter, and seeing that all chance of either photographing or sketching Mr. —'s face was gone, we discreetly retired, and went in search of sitter No. 3. The latter we found in an underground office lighted by gas. Clearly photography in the city was incomplete without magnesium wire or some other actinic illuminant. Here we were relieved by a promise to send a photograph, and again we stood in the street surveying our luggage with more disgust than ever.

"You'd never think these things were heavy, to look at them, would you?" said Easel disconsolately. "I declare I feel quite tired."

"And you wouldn't believe this harmless looking box was the most uncomfortable parcel in the world to lug about," was my reply.

"I've half a mind to go to the nearest railway station and leave them at the cloak room."

I was of the same, opinion for I loathed the box, the string of which had become loose, and, refusing to remain in the centre, allowed one end of the box to hang down, when it perpetually knocked against my legs, or, what was worse, the legs of other people. But it seemed weak to give up, and I suggested we should make our fourth and last call before getting rid of our burdens.

The office of notability No. 4 would have been admirably suited for photography had we had a chance, but No. 4, like No. 2, was very coy. Unluckily he had to be approached in the presence of his clerks, and to admit such a weakness as desiring to have his portrait published was not to be thought of.

"I am very much obliged, but it is too great an honour for so humble an individual as myself. Now, if you want a portrait, there's a man you might take," pointing to a chromo of Gladstone hanging on the wall; "and here's another," shutting the door and showing a companion chromo of Beaconsfield behind.

At the same time it was certain a very slight persuasion indeed would have made him yield; indeed, he confessed to having already had his portrait published in the local paper of the district, where he was a magnate of some importance.

This was our first and last experiment with photography. Possibly in the summer time, with suitable appliances, it may be of use, but much adroitness is



required. There is still a lurking suspicion that having one's portrait taken savours of vanity, and people do not like having their vanity made public. The employment of the camera necessitates privacy, and how the clerks are to be got out of the office of a busy city man while he is being photographed is not a very easy problem to solve.

The only other phase of hunting after portraits to which I need allude, is sketching portraits of the speakers at public meetings. Here the artist is met by another obstacle. It is true he has plenty of time to draw the faces of a board of directors, but when, in nine cases out of ten, they are seated with their backs to a window (for the meetings I refer to take place in the day) their features are often buried in a mass of shadow. Not infrequently a face may be lighted half from a window at the back and a little to the right, and the other half from a window at the side to the left. The temples and the whiskers are illuminated, but a great wedge-shaped shadow obliterates the eyes, nose, and mouth. Yet the portraits are expected to appear exactly as though taken in a well-lighted studio. To get people with no knowledge of art to understand these difficulties is almost impossible.

To sum up one's experience, it may be said that the result is a kind of philosophic bewilderment of mind, and we have come to listen to criticism with a fair amount of indifference. Not in any single instance do I recollect perfect accord between the sitter and his friend as to the correctness of a likeness. Those portraits which we have thought were excellent have been pronounced "not a bit like;" others, which we considered only had a faint resemblance, have elicited high praise. This kind of thing no doubt is familiar to photographers, but they have the advantage of an argument which artists cannot make use of: they have only to say, "Well, you must have looked as you are represented, for the camera cannot make a mistake," and the sitter is convinced, or ought to be.

### THE ETHER-OXYGEN LIME LIGHT.

BY F. M. IVES.\*

THE vapour of sulphuric ether has been found to give as good results as coal gas in the production of the lime light. As first employed for this purpose, the ether was vaporized by heat, but this method has always been regarded as troublesome and unsafe. Mr. S. Broughton, of England, tried to improve upon it by dividing the oxygen supply and passing a small portion of it through liquid ether, where it became charged with ether vapour, which it then conducted to the hydrogen side of the jet. There were several objections to this method; the oxygen could not be perfectly saturated with ether vapour in this way, and in a cold room or with impure ether there was always danger of the flame retreating into the saturator; if this occurred, it was almost certain to either burst the saturator and throw the burning liquid about the room, or to force it back into the oxygen holder and produce a still more dangerous explosion. The passage of the gas in bubbles through the liquid also caused the light to flicker so badly that I imagine few operators would have tolerated it. Mr. Broughton sought to overcome the first objection by packing the mixing chamber of his jets with granulated pumice, through which the flame will not readily retreat; but this made it almost impossible to use the light at all in two lanterns, connected through a dissolving key, and, of course, did not stop the flickering. Serious accidents resulted from the use of the wash-bottle saturator, and it was abandoned, after creating a general impression that ether could not possibly be employed with safety. Mr. Broughton afterwards used a saturator in which the oxygen was passed over the liquid ether instead of through it, and so stopped the flickering, but did not publish this method for some time. The first published improvement on the wash-bottle saturator was invented and patented by me in 1882. It consisted of substituting for the wash-bottle a chamber packed with a porous material, which was saturated with the liquid ether, and so arranged that the oxygen was charged with vapour without bubbling through the

liquid. This saturator was also provided with a removable cap, which permitted the porous filling to be removed and dried out whenever it became overcharged with the alcohol and water that is always present in commercial sulphuric ether. With this saturator the oxygen can be perfectly saturated with ether, and is then absolutely non-explosive; the light is also perfectly steady, and can be used with perfect success for dissolving, provided that the jets have small tubes and mixing chambers, and the dissolving key a proper adjustment. It is also absolutely safe, if properly connected with the lantern and oxygen supply, because even with an explosive mixture in the saturator, it is impossible to produce an explosion that will either damage it or throw out liquid ether. As originally placed on the market, this saturator was provided with removable rubber caps, for which the present owners of the patent have substituted a metallic screw cap, which is made to fit ether-tight by applying common bar soap to the screw-thread.

The ether light, as produced with this saturator, is now employed by some of the best known lantern operators in the country, who are enthusiastic in its praise; but in spite of the success and enthusiasm of many, there are some to-day who affect to believe that its use ought to be prohibited as dangerous, and others who are either too stupid or too "smart" to manage it successfully. Members of the Franklin Institute have had ocular demonstration of its success and convenience, as it has been used in illustrating most of the Institute lectures during the past year; but its greatest advantage lies in the extreme compactness and portability of the requisite apparatus. I will take the liberty to reproduce here some endorsements of the light by well-known men who have used it.

Professor William A. Anthony says: "With the same pressure of oxygen, the ether light is better than the hydrogen. . . . In the qualities of steadiness, freedom from noise, &c., it is certainly equal to any lime light, and in convenience of manipulation, especially for a travelling exhibition, it is far superior to either hydrogen or house gas."

Dr. John Nicol says: "I have been closely identified with lantern work since 1858, and have used and experimented with almost every method of illumination and every variety of apparatus that has been introduced or suggested, and have no hesitation in saying that the production of an oxy-hydrogen light of the very highest class is obtainable with this saturator with absolute safety, and with less trouble than by any other device or apparatus that I have seen."

Notwithstanding the great success of this means for producing the lime light, and the important advantages which it offers, I have always recognized in it certain minor faults, which I hoped to overcome in course of time, and my object in preparing this paper has been to call attention to some recent improvements I have made, which I believe will greatly extend the use of the light, and increase its popularity. The first improvement is in the construction of the saturator, which is reduced in size, yet increased in effectiveness. The second is in the use of petroleum ether (rhigolene), which gives the same light as sulphuric ether, but vaporizes at a lower temperature, costs much less, and contains neither alcohol nor water to accumulate in the saturator.

My improved saturator is in the form of a single metallic tube, 2 inches in diameter and 13 inches long, with a handle at the middle and a stop-cock projecting upward at each end. A neck, like that of a bottle, projects from the screw cap at the end, and is closed with a cork for convenience in filling. The passage for oxygen is over twenty inches long, in the form of a zig-zag channel through the upper surface of the roll of porous material, and secures complete saturation of the gas with vapour.\* The saturator can be filled from a bottle in one minute, and is ready for use at once, or may be kept filled for any length of time. The petroleum ether costs only thirty cents a pound, which is less than half the price of sulphuric ether; it also vaporizes at a lower temperature, so that the light can be used successfully even in a very cold room, and it has other advantages. Of course, it should be stored in a cool place and kept tightly corked. It is also necessary, when using it with oxygen from a cylinder, to use a valve that can be opened very slowly, because a very small amount of oxygen passing

\* This small saturator has been run continuously one three quarters hours with a pair of lanterns at the Franklin Institute, dissolving over 100 pictures; ordinary jets and "low pressure" dissolving key were used, with oxygen from a cylinder, without any "snapping" and without exhausting the ether supply. I believe it would have run perfectly for at least another half hour.

\* Read at a Meeting of the Franklin Institute.



through the saturator will produce a very large flame at the jet; the Shaw valve, manufactured by Mr. Shaw, a member of this Institute, fulfils the requirements, and is already largely used in this city. Some special instruction for the management of the light in hot weather may also be called for.

In conclusion, I give it as my opinion that this improved means, for supplying the hydrogen element is so much simpler and more convenient than any other, that it cannot fail to entirely supersede the use of hydrogen and coal gas, when its merits shall have become generally known and appreciated.

### Notes.

Jointly, the Photographic Society of Philadelphia, the New York Society of Amateur Photographers, and the Boston Camera Club have arranged to hold an exhibition each year; and this year the exhibition is to be held at Boston during the Spring. The Secretary is Ed. F. Wilder, of 50, Broomfield Street, Boston, Mass., U. S. A.

Since an ingenious French journalist pointed out that the name of the new French President might have been found buried cryptographically in the names of the five presidential candidates who were at first most favoured, thus:—

Frey-C-inet  
General S-A-ussier  
Fer-R-y  
Brisso-N  
Fl-O-quet  
General Apper-T

numerous examples of similar cryptograms have been printed. And it is doubtless a study of the specimens of this by no means complicated kind of puzzle exercise which has induced a correspondent to take the trouble to point out that the names of seventeen contemporary painters, if properly arranged, show in what a hostile way they regard photography. Thus:—

Fil-D-es  
Herk-O-mer  
W-atts  
Lo-N-g  
W-histler  
Milla-I-s  
Bough-T-on  
Leig-H-ton  
Fri-T-h  
Frank H-oll  
Burn-E Jones  
Ma-C-beth  
Rich-A-rdson  
Alma Tada-M-a  
Oul-E-ss  
Sto-R-ey  
M-A-rks.

It will be readily seen that the oracular sentence evolved from the names in question, is "Down with the Camera." But if, instead of the first four names, we were to substitute, say, "Burgess" and "Paynter," we could as easily evolve the sentence "Up with the Camera." So our correspondent must try again.

Perhaps the only real photograph of the Queen yet published is that of Mullins, issued with the YEAR-

Book, and moreover this untouched portrait from a pleasing memorial of Her Majesty's Jubilee year, which many of those who are subject may be pleased to possess.

The commercialists who are now trying to boom a Welsh gold mine which was discarded nearly twenty years ago will certainly have at their disposal better methods of extracting the gold, and hence the concern may now prove workable; but photographers must not expect the Welsh mine to make the toning of prints a cheaper process.

Those who believe that the sanitary administration of the City of London is excellent, will be surprised to hear that there is—even in the face of the existing epidemic—most terrible neglect as regards the removal of dust and house refuse from the houses occupied by poor families, especially in the neighbourhood of Greystoke Place and Norwich Court, where day after day, and even week after week, the same heaps of dust poison not only the unfortunate poor, but also those living outside this neglected district. Writing to the medical officer of health having proved of very little use, we understand that arrangements are being made to photograph the dust heaps from day to day, and to publish these photographs when the salaries of the highly paid City officers are under consideration. The photographs will show what a mistake it is to suppose that Londoners have a chance of getting rid of their house refuse daily; and, what is more, the neglected houses are just those where daily removal is important—houses where many families are crowded together in rooms over the fuming dust heaps in the basement.

In the great engineering works at Creuzot, electricity is employed when an extreme temperature is required, the heat in the luminous centre being of sufficient intensity to melt steel instantly, though at five yards distance the thermometer scarcely records an increase of temperature. Notwithstanding this, spectators at a distance, say, of ten yards, become conscious of acute pain, recalling the sensation of sunstroke. When persons have witnessed the experiments for some time they feel a burning sensation in the neck, face, and forehead, and their skin assumes a coppery red tint, together with other unpleasant sensations. Two doctors, M. de Parville and M. Defontaine, medical officer of the Creuzot Company, have investigated the phenomenon, and have come to the conclusion that they are due to the effects of intense light. M. de Parville inclines to the theory that the violet and purple rays, rather than the red and yellow, are the cause; M. Defontaine gives no opinion on the subject. The term given to this curious effect of light is sunstroke by electricity, which, though intelligible, is not very exact.

Whenever photography gets into the law courts it always gives rise to some points of novelty. The latest instance occurred over the binding of a photographic album. An auctioneer of Dorking had spent some time in



collecting photographs on cards, which he took to a London firm, who undertook to have them made up into an album and bound. They entrusted the work to another firm who charged £8 10s., but when the album was returned the auctioneer alleged it was thoroughly spoiled in consequence of having been irregularly cut and badly bound. He refused to pay, whereupon the agents sued him, he in the meantime having set up a counter claim of £10 for damage he said he had sustained, having now lost all interest in it. Judgment was given for £2, a reduction which seems to vindicate that there was something in the defendant's complaint. But what kind of photographic album could it have been for which £8 10s. was charged originally? As for the counter claim of £10, this was abandoned, which was rather a pity, as it would have been interesting to have seen how it was arrived at—whether the defendant assessed his “interest” at so much a photograph, or roughly on the bulk.

The *Revue Scientifique*, in noticing a volume entitled “La Photographie Moderne,” by Albert Londe, remarks, *apropos* of the wide-spread influence of photography, that there is nobody who has not in some way found photography useful, and regrets there is no part in the administration of the public service especially devoted to photographic science. If such a department be ever formed, it will be left to France to take the initiative. In England Government is very slow in patronizing science, and when it does, rarely gives entire satisfaction.

*Apropos* of photography on wood, it may be said that it has almost revolutionised the engraver's art. Effects are now produced, as may be seen in the high-class American magazines, which the old engravers of the “cross-hatching” school would not only have deemed impossible, but would have looked upon with contempt. The practice now is for the engraver to cut the photograph on wood with the original drawing before him, and, discarding the rules by which he used formerly to obtain effects, endeavour to reproduce as nearly as possible the touch of the artist. W. J. Linton, the well-known wood engraver, who for some years past has been in America, wrote a couple of years ago in very severe terms of the decadence of wood engraving. If he meant the old conventional style, no doubt he was right. But whether this decadence is to be regretted is another matter. The delicate, highly-wrought wood engraving of the present day owes much to photography.

It is strange no one thought of taking an instantaneous camera to the recent prize fight. Such is the interest in the contest, the photographs would have sold like wildfire. Unfortunately the fight did not begin until two o'clock in the afternoon, and this hour in the winter is not only too late for photography, but also, in the opinion of the best judges, for fighting also. It is to be hoped that the next prize fight will be better managed. Each round might well be photographed, and we should then get a complete story of the contest, for as matters are now,

Smith's partisans declare that Kilrain cannot hold a candle to their favourite, and *vice versa*. Any way, if the backers of the combatants object to a pictorial and faithful record, they would probably not object to the champions being photographed before and after the fight. The pictures would serve as an interesting memento to the admirers of prize fights on the one hand, and would be brought forward by their opponents as an irresistible proof of the brutality of the exhibition.

*Apropos* of the lamentable outcome of the affair—the mysterious disappearance of Archibald McNeill—it may be said that the portrait published in the *Pall Mall Gazette* does not in the opinion of those intimate with Mr. McNeill resemble him, save that the portrait, like the original, has long hair, a beard, moustache, and spectacles. Probably the published portrait is from a photograph taken when Mr. McNeill was some years younger. It is curious how few men are photographed now-a-days, and yet one never knows when a good photograph of oneself may be wanted. Oddly enough, Mr. McNeill is one of the few members of the Whitefriars Club whose portrait is not among the unique collection of photographs, the work of Valentine Blanchard, which adorns the walls of the club room.

#### A FEW REMARKS ON THE CONSTRUCTION AND REQUIREMENTS OF PORTRAIT ART.

BY NORMAN MACBETH.\*

I SHOULD like, now, to make a few remarks on the light directed on the subject. Everyone engaged with portraits has his own notion regarding the structure of a studio to meet their method of lighting, and the command they can have in producing certain effects on the subject.

My own practice hitherto has been mostly with a window facing the west, with obscured glass, and placed at an angle of forty-five degrees. But latterly I have been using a very large window placed vertically facing the north-east, with a spring blind at the bottom to cut off the light at various heights at my pleasure as the subject may require to be treated. And were I a photographer, I would certainly adopt this latter, only I would have in addition a recess or cave underneath the window in which the camera would be placed, enabling one, by bringing the subject nearer, to get broad shadows if desired; or, by placing the subject far back, and with the use of a long-focussed lens, the light over the face could be well diffused, producing great breadth of effect. At the end of this recess a compartment by itself could serve as a convenient developing room.

The degree to which shadows should be expressed on the face is matter of opinion and taste to a certain extent. High relief of the features is a good thing when they are beautiful in form, and contribute to enhance the expression; but one has to be cautious in order to avoid giving a false aspect—an appearance with which we are not familiar, and which is unlike the subject. Persons with large features, especially nose and mouth, should not have the shadow strongly or broadly expressed. In such a case reflected light thrown into the shadows prevents the appearance of elongation; but where the features are short, broad shadows under the eyes, nose, and mouth should be aimed at.

Alluding to the different degrees of light and shade as treated by various schools—after having observed and studied them carefully, my own feeling is in favour of the Venetian, as represented by Titian, in which there is no special presentation of shadows on the face for their own sake; colour was of greater importance to them. You never think of their manner of producing effects, because that element with them was much kept in abeyance. Their work in portraiture is characterised by great naturalness, at the same time by much breadth and classic refinement.

\* Continued from page 14.



The Spanish school, again, carried breadth of shadow to a very prominent degree; shadows so deep that outline was lost, one part running into the other, and only the lights made out the form. Great breadth in shadows and scarcity of light was also very apparent in the Dutch school, especially in Rembrandt's portraits, which are always regarded as the greatest of this kind, and if we except the Spanish painter, Velasquez, no painter has ever reached his power and knowledge of *technique*—witness some of his portraits in the National Gallery. But speaking of portraits in general for design, arrangement of effects, and beautiful crispness of quality in manipulation, Velasquez is the painter to look at, and who will still rise in estimation in history.

In the Scotch school the portraits of Sir Henry Raeburn exhibit great originality in the treatment of very broad and natural effects of light and shade on the face. His manner has always been so strongly pronounced that no one could in any measure follow it without being detected as an imitator. No portrait painter of this country has excelled him in his peculiar walk, especially in breadth of shadows on the face. The only man of his time who did resemble him was Andrew Geddes, but his style had not a little of the over-refinedness of Sir Thomas Lawrence.

To produce these broad effects, the light must come from a high source by shutting up a considerable portion of the window at the bottom; then place the subject to suit the effect you want, and which best becomes it. I always use a small, square platform about six feet square, and one foot and a-half from the floor, with large castors. On this platform I have the accommodation for a good-sized square table, capable of receiving books, newspapers, or any other object likely to be of service in composing along with the subject proper. On this platform the person is asked to take the chair placed there. I engage his attention in a little conversation apart from the special object. Meanwhile, I am carefully watching his movements, especially the action of the hands. Should a position occur that is agreeable, I arrest it by telling the sitter to keep that position for a little. I then notice the effect of light on the face. If not satisfied, I lower the blind, if need be. If now content with the quantity of light, I turn round the platform without the sitter moving, and see whether the lines of the figure may not be improved. If satisfied, I mark with chalk the position of the platform on the floor, the feet of chair and table, and other things if necessary, all of which are easily found should they be put out of place.

It is of great value to have a platform; this raises the sitter, gives dignity to him, the neck lengthens, the shoulders appear squarer, and the limbs finer in foreshortening. The horizontal line is lowered, and thus prevents the perspective of the floor from appearing too much on an incline. Of course, in photographing, these results depend very much on the relative height of the camera to the sitter.

In taking a position of the sitter, notice very carefully, whatever you fix upon, that it is natural and easy. You may rest assured that all good composition is so. Avoid too much interference with your subject, unless it be that, owing to photographic necessities, you must endeavour to keep all the parts in fine relationship in point of size, and also in focus; but neither constraint or restraint should show itself in the feeling of the subject—every action should appear as an emanation from the subject, and not from the artist to the sitter.

I have chosen this subject to-night by way of getting an opportunity of reiterating and keeping up the topic brought lately before some other societies by me on the construction of pictures in general—landscape, and landscape with figures—believing that so far as the art element is concerned it is one of the most important branches of study, meeting the wants of the present stage of photography. Indeed, I venture to say, I can already see in many of the photographic productions of landscape work last summer the results of acting on the principles then presented for consideration.

I then brought especially before notice the importance of a very essential element in the construction of a picture, viz., the relative proportion of the breadth of a picture with the length of it. This ought to be thoroughly understood and acted upon. I shall illustrate and explain this immediately when the lantern is employed. The best bearing or proportion always consists in being made up of odd numbers, for instance, say, three parts in breadth by five parts in length, or five by seven. This latter proportion is as nearly as possible the proportion of the half-plate. When made an eighth less than the size of print on a

glass plate, and properly divided by these numbers, or more if you please in that ratio, it is admirably adapted for guidance in the formation of the boundary lines of either a landscape or portrait when it is found necessary to cut down a print before mounting.

By the practice of this you will be surprised and delighted to see the number of pictures in a landscape, or the variety of treatment that may be rendered on a portrait, which a single impression from a negative may produce according as these divisions are judiciously placed over the surface.

I shall now, with the aid of the lantern, glance at a few of the principles to which I have alluded, and which may now be more or less familiar to several here. I wish especially to point out wherein they have a bearing on the present subject, portraiture.

To begin with, we have in the square form of lantern slides a good illustration of how the merely descriptive and the pictorial are distinguished. However beautiful and interesting the matter of a microscopical or geological specimen may be, yet limited or bounded as it usually is by a complete square or round form, it is not to be regarded as a picture; not altogether because it is a scientific subject, but because it has a boundary line of no importance beyond merely circumscribing the matter.

The boundary lines of a picture or portrait form a special part of art, not only enhancing but giving value and force to parts according to their position in the field. The former—the complete square—having all the sides equal, is only fitted to serve the purpose of a diagram, which may contain a figure or plan to illustrate any statement or mere description of a place. The moment you put a landscape or portrait into a slide with a view to exhibit pictorial effect, the extreme square appearance, which possibly the subject may require, must not be felt; it ought to be visible that it is rectangular, but the length of the picture, some way, either vertical or longitudinal, should be greater than the breadth.

No. 1. This is a square divided equally each way. Where the lines intersect the centre is found. To place an object on this is to place it on the weakest point, inasmuch as it is equally surrounded; consequently there is no force in it, it is too perfect, there is no scope for the mind to operate. An inequality is striking—it commands notice, hence the value of odd numbers to supply points of variety. Divide this square then into three divisions each way. The intersections are in a measure supplying something of that want, but by reason of the sides of the square being equal no portrait could effectively be placed on these intersections. But make a difference of the length from the breadth by adding two more odd divisions to the bottom side, making the proportion 3 by 5, immediately you set up a field on which a picture or portrait may be constructed. All the prominent and salient points of a scene, or the head and hands of a portrait, should be placed on some intersection of subdivisions, but every intersection must not be supplied or taken up, and while you seek to balance it must be only through great variety of arrangement.

To meet the general requirements of portraits, perhaps the proportion of 5 by 7 is the most useful. This is the proportion of the cabinet portraits, and to all possessing a half-plate camera I would strongly recommend divisions of five each way to be drawn with vermilion lines on the focussing glass. They will be found to be extremely serviceable either for landscapes or portraits. It is the same proportion as that to which I have alluded, viz., the length of the picture being the diagonal of the square of the breadth.

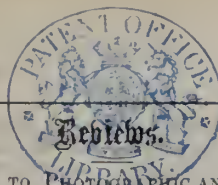
It would be found very useful in preparing lantern slides to have a variety of proportions, such as I shall now exhibit, cut in glass, for the purpose of defining select portions of a scene or portrait previous to making transparencies. As it is desirable to have the subject as large as the slide when mounted will admit, let the largest number in the different proportions be always the full limit of the slide. Begin, then, with dividing the full extent into five spaces, and with same size of space measure off three, which is to constitute the breadth of picture. This proportion then is, say, 3 by 5. Then following with fresh calculations with odd numbers—viz., 5 by 7, 7 by 9, 9 by 11, 11 by 13, 13 by 15, 15 by 17, 17 by 19, 19 by 21, each proportion increases in breadth till it becomes to all appearance less elongated and assumes nearly the proportions of a complete square. This last proportion is not likely to be required for any pictorial purpose by any subject, and it should be avoided if possible. If you wished any of these proportions, with their respective numbers ruled on the glass, with a view to find intersections, a glass cutter could bite them with acid, and the lines afterwards could



be filled with vermilion to make them more visible. I would recommend this to be done on the plate of the proportion of 5 by 7. But remember, if proper intersections are to be found, it must be of those which are formed by an equal number on each side. Divide this proportion, 5 by 7, into five each way, and the subdivisions repeat the same proportions as the external boundary. It is on such a relationship that they serve as *forte* points.

I shall now explain the rest of the illustrations verbally in their order. No. 2. 3 by 5, already alluded to, is the proportion fitted either for a landscape or portrait, specially the full-length standing posture, or the half-length standing illustrated in No. 17. No. 3. 5 by 7, already alluded to, is the proportion fitted for general purposes, specially that of the half-plate size, cabinet portraits, and the sitting full-length portrait illustrated in No. 23. No. 4. 7 by 9. The proportion of the Kit-cat size, and Bishop's half-length, illustrated in No. 22. No. 5. 9 by 11. The proportion of the English head size illustrated in No. 19. No. 6. 11 by 13. The proportion of the ordinary half-length illustrated in No. 21. No. 7. 13 by 15. The proportion of the ordinary head size, admitting a hand if required. No. 8. 15 by 17. The proportion recommended not to be exceeded for lantern slides. No. 9. The proportion most frequently employed—constituted by the length of the boundary being the diagonal of the square of the breadth. No. 10. An application of the last proportion to portrait use, subdivided by the odd numbers of five each way, the intersections of which constitute *forte* points, and on which the chief values may variably rest. No. 11. An application of the same proportion to a landscape, but subdivided by the odd numbers of three, showing the intersections in force. No. 12. Represents the first sitting of a person for his portrait, taken without arrangement or treatment of any kind. The position altogether shows the necessity for such. No. 13. Represents an effort on the part of the individual to pose himself when asked, exhibiting the evil effects of angles produced from head to foot. No. 14 represents the position of the person arranged, his *compos* in feeling, the diagonal line of the body and limbs, the position of the hands—not immediately under the head, and well apart from each other. No. 15 represents the bad effect of the head facing the narrowed side of the boundary; there is no feeling of space to look into. No. 16 represents the same position, but the head looking towards the side of the boundary of greatest space. No. 17. The portrait of a lady—the proportion of boundary is 19 by 21—showing the bad effect of too much space unoccupied within it, the desirableness of giving more effect to the head and less to the body, and also making the representations of furniture in the background less apparent. No. 18. Represents the same corrected in every respect, and making the proportion 3 by 5. No. 19. Represents an English head-size portrait, 25 by 20 inches. Proportion, 9 by 11. No. 20. Proportion, 9 by 11. Represents a small, half-length portrait, 44 by 34 inches, of an old gentleman, around which there are no accessories, and is not desirable in this size. No. 21. Proportion 11 by 13. Represents the ordinary half-length portrait, 50 by 40 inches. The head is resting on one hand, and the other resting on the limbs, which lies across the picture diagonally. No. 22. Represents two sizes of portraits, both of which are the same proportion, 7 by 9. The smaller one represents the Kit-cat size, 36 by 28 inches; the larger one, the Bishop's half-length, 54 by 44 inches. In the Kit-cat size we have a good illustration of the value of both hands together, also balancing the position of the head. The Bishop's half-length admits any amount of accessories if required. The Kit-cat size shows here the space of a quarter of a head above the hair, the Bishop's half length a full head. No. 23. Proportion, 5 by 7. Represents a full-length sitting portrait with the space of two heads above the head. The figure on the mantel-piece balances and fills up the space behind the figure proper. The body is placed diagonally across the field, and the one limb differs from the other in position. There is only the space of one head below the feet to the base line of boundary.

In conclusion, I have only to say that in art there is no strictly prescribed rules for the treatment of portraits, except it be the government of a few leading principles which I have endeavoured to set before you to-night, all of which are in accordance with natural law and order. So long as we keep within this common-sense limit, we are free to invent as much as we please. There will always be portraits and portraits, but preference will always be given, either in painting or in photography, to that which manifests the most culture and refinement, free from all vulgarity, full of life, and true to character.



PRACTICAL GUIDE TO PHOTOGRAPHIC AND PHOTO-MECHANICAL PRINTING. By W. K. Burton, price 4s. Red cloth, crown octavo, 355 pages. (London: 1887, *Marion and Co., 22, Soho Square*)

W. K. BURTON gives us, as those knowing him can readily suppose, a thoroughly practical and excellent guide to the silver printing process; this division of the book comprising not only the everyday manipulation of the printing room where albumenised paper reigns supreme, but also the various silver emulsion printing methods, such as gelatine bromide, gelatine chloride for printing out, and collodion emulsion. As a thoroughly useful handbook of silver printing, Burton's present book stands out prominently by virtue of its thorough reliability, fullness, and accuracy. The account of the carbon process is, on the whole, good, and sufficient to guide a beginner in this department of work; but the chapters on photo-mechanical printing are hardly full enough to constitute the present a text-book on this very wide subject; and, moreover, some very unaccountable errors have found their way into this department of the book, perhaps due to the fact that the author has not had proper opportunities of looking to the proofs. In a future edition we hope to see the errors corrected, and much more space devoted to the important subject of photo-mechanical printing.

PHOTOGRAPHIC MOSAICS, An Annual Record of Photographic Progress. By Edward L. Wilson. (1888, *New York: Published by the Editor.*)

EXCELLENT in substance and in form comes to hand the last issue of Wilson's annual, the present issue being the twenty-fourth.

A portrait of the Editor—taken by Adam-Salomon—forms the frontispiece of the book, and the standard of the contributed articles is well maintained.

## Patent Intelligence.

### Specifications Published.

2,012. G. J. SERSHALL, "Printing artificial skies by photography on to photographs."

2,042. J. R. GOTZ, "Photographic cameras."

2042. JOHN RUDOLPH GOTZ, Optician, of 19, Buckingham Street in the City of Westminster, for "Improvements in photographic cameras."—Dated 9th Feb., 1887.

The claims are:—

1. In a photographic camera, the combination of a base-board carrying a toothed pinion, with a camera body having at the bottom a circularly curved rack, and a link pivoted at its lower end to the side of the base-board, and at its upper end to the side of the camera body, substantially as described.

2. The combination of a base-board having a lateral rail or guide, with a sliding frame adapted to slide along the said rail and to be fixed thereto, a toothed pinion held by the said sliding frame, a camera body provided at the bottom with a circularly curved rack, and a link pivoted at the top to the camera and at the bottom to the sliding frame, substantially as described.

3. The combination of the base board B, having a pair of rails *b*, with a pair of sliding frames C, carrying pinions E, a camera body A having a pair of racks *a*, and a pair of links F, the whole arranged and adapted to operate substantially as described.

2012. GEORGE JOSEPH SERSHALL, of 371, Lodge Road, Hockley, Birmingham, in the County of Warwick, Artist, for "Improvements in printing artificial skies by photography on to photographs."—February 9th, 1887.

The Patentee says:—

A drawing is made of a portion of a sky upon stone, paper, zinc, wood, copper, glass, or any other suitable material for printing from either by letter-press, lithographic, copper-plate, zincographic, or any other suitable printing method, from which impressions are printed on to paper, gelatine, glass, or any other suitable material already transparent, or to be made transparent



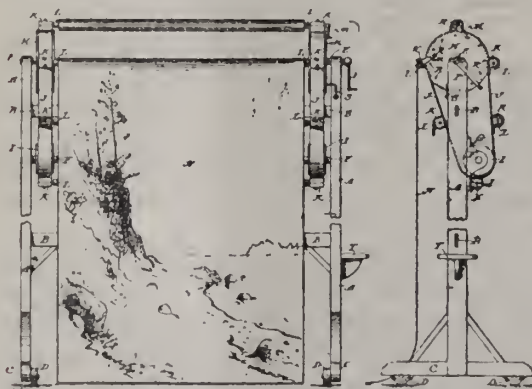
after printing by varnishing or other means. Then a photographic negative being taken of a landscape or view, the part representing the sky is stopped out or rendered opaque. A photographic print is then taken from the unstopped portion of the negative on sensitized silver paper, from which the black portion corresponding with the stopped-out sky in the negative is carefully cut off to the edge of the landscape or view. This sensitized paper in this condition is next exposed to daylight and allowed to become black, and is afterwards used as a mask in the process of photographic printing in accordance with this invention. With the said transparency representing a sky, the said partly stopped out photographic negative and the said mask, all prepared as described, the process of photographic printing is as next follows. A sheet of sensitized paper is placed in contact with the aforesaid negative, and the unstopped portion of it printed in the ordinary photographic manner, and on this operation being completed, both are removed from the printing frame, and a sheet of clean glass of a suitable size placed thereon. Upon this glass the transparency representing sky is next placed, and then that portion of the sensitized paper upon which the landscape or view has been printed and is to be retained, is carefully protected and accurately covered by the blackened mask, and both in this condition placed upon the said transparency intervening between them and the clear sheet of glass. All these then being properly exposed to light, the picture, including the sky, will be printed and completed.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is: In the process of printing artificial skies in photography, the mode of producing and of using the transparency representing a sky, the partly stopped out negative and the photographic mask as herein described.

#### Patents Granted in America.

375,006. LAFAYETTE W. SEAVEY, New York, N.Y., for "Supporting frame for photographic background."—Filed February 23rd, 1887. Serial No. 228,471. (No model.)

*Claim.*—1. The combination, with a horizontal supporting shaft or drum, of an endless chain of parallel independently-rotating rollers carried over said shaft and adapted to receive flexible background, substantially in the manner and for the purpose herein set forth.



2. In a support for photographic backgrounds, the combination of an endless belt, a horizontal shaft or drum over which said belt is carried, a supporting-frame for said shaft, journal-bearings fitted to and carried upon the outer face of the belt, and independent parallel rollers mounted in said bearings, substantially in the manner and for the purpose herein set forth.

3. The combination, with a suitable supporting-frame, pulleys mounted at the top thereof, and an endless chain of rollers carried over and depending from said pulleys, of a second set of pulleys mounted on the frame below the first at the rear of a vertical plane passing through their axes, and over which the lower end of the chain of rollers is carried, substantially in the manner and for the purpose herein set forth.

4. The combination with a suitable supporting-frame, pulleys mounted at the top thereof, and an endless chain of rollers carried over and depending from said pulleys, of a catch on the frame fitted to engage a series of apertures in the lateral face of one of the pulleys, substantially in the manner and for the purpose herein set forth.

375,230. JOHN W. TINSMAN, Kirksville, Mo., "Photographic accessory."—Filed June 28th, 1887. Serial No. 242,778. (No model.)

*Claim.*—1. In photographic scenic exposures, the method herein described of exposing as a ground scene grasses, grains, or plants in front of or about the subject being photographed, which consists in mechanically clamping said grasses, grains, or plants in an upright position, as set forth.



2. The within-described photographic scenic accessory, which consists of longitudinal clamping-bars adapted to hold between them grasses, grains, or plants, means for adjusting said bars relatively to each other, and one or more cross-feet or base-pieces supporting or carrying the whole, essentially as specified.

3. The combination, in a photographic scenic accessory adapted to hold in an upright position grasses, grains, or plants of the horizontal-bar *b*, the cross-feet or base-pieces *c*, and the adjustable horizontal clamping-bar *b'*, with means for securing and holding it in variable relation with the bar *b*, substantially as shown and described.

375,231. CHARLES H. TONNDORFF, St. Louis, Mo., assignor, by direct and mesne assignments, to Henry Kuhn and the M. A. Seed Dry Plate Company, both of same place, "Photographic negative-plate."—Filed March 29th, 1886. Serial No. 197,012. (No model.)

*Claim.*—As a new article of manufacture, a photographic negative-plate having an undeveloped vignette or border upon that part of the plate-film which surrounds or partially surrounds the space to be occupied by the desired picture.

## Correspondence.

### ORTHOCHROMATIC PHOTOGRAPHY.

DEAR SIR,—In again claiming your indulgence for our reply to Mr. Bothamley's letter, which appears in your issue of December 23rd, we will endeavour not to occupy too much of your space, or try too severely the patience of your readers.

In venturing to differ from Mr. Bothamley as to the accuracy of many of his statements and most of his conclusions, we were fully aware that we should be equally in opposition to the opinions of the writers whom he now quotes as authorities, and with whose published works we are quite familiar.

Mr. Bothamley is, however (as usual), not quite accurate in his assertion that on the other side we have only our *ipsi dixit*. Referring to what we have called the "mistaken theory of optical sensitizers," Capt. Abney, in page 39 of his translation of "Dr. Eder's Chemical Effect of the Spectrum," says: "I must enter a protest at once against all theories of the existence of optical sensitizers; it is against all known laws of molecular physics. If the theory of optical sensitizers were correct, we should have



to believe that a ray of some particular refrangibility which was absorbed by a dye was, in its partially absorbed state, capable of acting more vigorously on the salts of silver than the same ray totally unabsorbed could do. A combination between the dye and free silver . . . will account for the phenomenon without doing violence to known physical laws."

This view is corroborated by the practical experience of Messrs. Wellington, Hyslop, and others, and is also emphatically endorsed by Attout-Tailfer himself, who, as an expert in this particular subject, is probably without equal. If it be true, as shown by Capt. Abney, that the whole theory of optical sensitizers is a myth, what becomes of the accuracy of many of Mr. Bothamley's statements, whether made on his own authority or that of others, and of what scientific value, in relation to the subject, are his spectrum experiments with stained or dyed films of plain gelatine?

If Mr. Bothamley was aware that the colour of the film had nothing whatever to do with the orthochromatic effect, and that the silver compound could be "separated from the dyed or stained gelatine without losing its orthochromatic properties," why did he not state such an interesting fact, instead of allowing it to appear in print for the first time in our letter in the News of December 16th?

In connection with this point it is a significant fact that Dr. Vogel, one of Mr. Bothamley's great authorities, and the author of the optical sensitizing theory, has recently applied for a patent in this country, for the use, in the gelatino-bromide process, of the chemical combination between the eosine dyes and salts of silver, claiming the combination as a new discovery, notwithstanding that it has always been used in the Tailfer and Clayton process, which is incorrectly described by Mr. Bothamley (p. 115) as "a process of staining gelatino-bromide plates with eosine." We are at a loss to understand Mr. Bothamley's undisguised animosity to this patent (No. 101,1883), which he seems to have misunderstood or misrepresented from the first. In his unjustifiable attack on the specification (page 708), and again in page 766, he states authoritatively that "the proper proportion of dye to be used is essential to the successful working of the process." He now says in his letter (page 811): "I never advanced this statement as a discovery of my own," and further admits that he "purposely omitted" an important part of the process, i.e., the washing of the plates after bathing, in order to "follow the lead" of his quoted authorities. We regret to find that this omission, which makes all the difference in the results, was not made inadvertently by Mr. Bothamley as we supposed; he might at least, for the sake of fairness, have tried the process in its entirety before condemning the patent as invalid, because he considered the process unworkable in its mutilated condition. A single experiment would have shown him that while a plate simply treated with a given solution of eosin or erythrosin, and dried, would give no orthochromatic effect, the same plate thoroughly washed after the application of the ammoniacal solution of eosine would be strongly isochromatic, and would give good results without the yellow screen, which is not (as stated by Mr. Bothamley) essential with these plates, in order to obtain fairly correct gradation.

Without gratuitously assuming that Mr. Bothamley is ignorant of these facts, we may call attention to his long list of failures, or partial failures, when working without the screen, which are recorded in one of his articles page 567. Judging from his description of the objects photographed, we have no hesitation in saying that he would have obtained very different results if he had adopted the method we have indicated, and better still, if he had used properly prepared plates made with isochromatic emulsion. The detailed description of most of Mr. Bothamley's experiments with "dyed" and "undyed" plates may be taken as a fairly complete set

of instructions "how not to do it." Any successful, or partially successful, results obtained by him were due, not to his dyed films, but to the fact that he had used as the colouring matter erythrosin and ammonia, as in Tailfer and Clayton's process, and thus obtained the colour sensitive compound of silver bromide which is the basis of this invention. We need scarcely point out that the process used by Mr. Bothamley (as well as nearly every one of those he refers to under the names of Vogel, Eder, Obernetter, Mallman and Scolik, and others) is a direct copy, more or less imperfect, of Tailfer and Clayton's patented process, and would constitute an infringement which could not lawfully be used in this country.

In reference to the alleged superiority of the bath process (about which Mr. Bothamley certainly expressed his own unqualified opinion, see page 550), Attout-Tailfer, the inventor of the process, says, in the *Moniteur de la Photographie*, October 15th, 1887: "Le trempage de la plaque faite est absolument un moyen empirique empêchant d'obtenir des produits stables; la méthode qui est la seule bonne est la méthode qui consiste à faire le produit directement par incorporation de la solution ammoniacale d'éosine dans l'émulsion de gélatino-bromure d'argent au moment de sa formation." The well known fact above mentioned, that bathed plates will not keep, and that they are liable to fog during development, would alone be sufficient to cause such plates to be superseded by those prepared by the more perfect and permanent method. We would further submit for Mr. Bothamley's "careful consideration," that as the question is one of facts, which could have been ascertained by careful experiment and comparison, it would have been more to the point if he had deferred the expression of his opinion until he had fully tested the matter for himself, instead of relying upon the statements of others. It is doubtless less trouble to "err in good company," but such an excuse would never for a moment be offered by a scientific investigator who cared to make any pretensions to accuracy in his work. We can quite understand that Mr. Bothamley, whose time, as he states, page 766, is "pretty fully occupied with other matters," can only have gained a very superficial knowledge of the practical part of the subject in the short time he mentions, and we are scarcely surprised that as a young beginner he should trust implicitly to the guidance of the authorities he has quoted. We can only repeat the expression of our opinion that when he gains further experience he will find that much of his former work will need correction. We have tried to point out at his request a few particulars in which it will bear revision.

If Mr. Bothamley "prefers" to continue in error, we can have no possible objection; but if his object be to ascertain the truth, and to find the best means of producing the most perfect results in orthochromatic photography, and to record faithfully the progress which has been made, we shall, as we have already stated, be happy to assist him, and we do not doubt that we shall be able to furnish further hints which will materially aid him in his investigations, asking only in return the "careful consideration" he has already promised.

We hardly know how to refer to the concluding paragraph in Mr. Bothamley's last letter, which seems, if possible, more than usually complicated. He says, "The gist of the complaint lies in this: that up to the present I have chosen to confine my attention to bath processes, and have made no special mention of the Attout Clayton (?) process of adding the dye to the emulsion." We should be glad to have some explanation of this paragraph. Does Mr. Bothamley mean your readers to infer that the bath process as used by him is not included in Tailfer and Clayton's patent? And does he really suppose that any part of their process consists in merely "adding the dye to the emulsion"? If Mr. Bothamley will answer these two questions, we may, perhaps, on a future occasion point out "other important matters which are clearly indicated."



The reference to "azalin" is, we presume, intended as a joke upon your readers. It has long been played out. The substance referred to is not known to chemists under that name.—We are, yours very truly,

B. J. EDWARDS & Co.

*The Grove, Hackney, London.*

### THE INSURANCE OF A STUDIO.

SIR,—Might I trouble you to let me have the address of an Insurance Office that will insure the contents of my gallery at a fair rate?

Why I ask you is this. A few days ago, wishing to increase the amount of my Fire Insurance, I wrote a Dublin office (with whom I had my shop, household furniture, &c., insured for £550 at the rate of 3s. per cent.), asking them to quote £1,500, and mentioning that I wished my photographic gallery to be included in that amount.

Their reply is, for stock, as described in existing policy, the rate of premium would be the same on increased amount, i.e., 3s. per cent. For a photographic gallery, however, the usual rate is 7s. 6d. per cent., and if the entire premises communicate, the increase will apply to both shop and gallery.

Now, Sir, as there is no risk whatever connected with my gallery, I fail to see why they should increase my premium for shop from 3s. to 7s. 6d. per cent., and having seen in your columns and the YEAR-BOOK reference made to the subject, I take the liberty of asking you to kindly give me some information on the matter.—Thanking you in anticipation, I am Sir, your faithfully,

T. A. MERCER.

28, High Street, Enniskillen, 7th January, 1888.

### THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN ELECTION.

DEAR SIR,—The attention of members of the Society should be drawn to the fact that at the forthcoming election the names of nominators of candidates for office will be published. This, of course, is a great matter for regret, as tending towards the introduction of the worst electioneering practices. But as the Council, in the exercise of their wisdom, have decided that it is to be so, all that members can do is to take steps to ensure their nominees being well backed up. There is little doubt that at this, as at former elections, under the same regulations, a small section of the Council will combine to secure the election of gentlemen who will be likely to support the present very unsatisfactory arrangements, and it will be well, therefore, to carefully scrutinize the balloting paper before deciding how to vote.—I am, &c., A. MACKIE.

10, Queen's Road, N.W., Jan. 10th, 1888.

### PHOTOGRAPHIC OBJECTIVE.

DEAR SIR,—The separation of the members in a telescopic objective for photographic purposes is not such a new idea as one would suppose from the description, page 6 of the P.N. M. Baer, at Caen, used it in 1886.—Yours truly,

W. R. KENNAN.

*Dublin, January 8th.*

## Proceedings of Societies.

### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

AN ordinary meeting of this Society was held on Tuesday, the 10th inst., at the Gallery, 5A, Pall Mall East, JAMES GLAISHER, President, in the chair.

On the reading of the minutes of the meeting of December 13, S. G. B. WOLLASTON rose to correct the statement appearing therein, that he was satisfied with regard to the election of members at the previous meeting. What he had stated was that he was satisfied that the protest which he had handed in before the meeting had not been brought to the notice of the

President. The minutes having been amended accordingly, were confirmed and signed.

S. G. B. WOLLASTON then said that he had a matter to bring forward, but the President ruled he was out of order.

W. E. DEBENHAM then moved that Mr. Wollaston be heard, and A. MACKIE seconded the motion, which, being put by the Chairman to the meeting, was carried.

S. G. B. WOLLASTON then recapitulated the circumstances of his delivering his protest to the assistant-secretary, and after stating that he had absolutely no personal feeling, but only the welfare of the Society at heart, concluded by moving that a committee be appointed from those now present, to consist of five members, to enquire fully into the circumstances attending the non-production of a written protest which was placed in the hands of the assistant secretary preparatory to the meeting of Nov. 8, and, further, to take into consideration the effect of the non-production of the protest upon the candidature of Mr. —, and to report to the next meeting of members.

THE ASSISTANT SECRETARY: I declare absolutely that I never saw it; I never had it in my possession.

H. TRUEMAN WOOD: I think the motion a good one, and I second it.

The motion was put to the meeting and carried, and the following members were appointed to act as the Committee:—T. Bolas, W. Cobb, W. E. Debenham, A. Mackie, and H. Trueman Wood.

A. MACKIE then called attention to statements in the current number of the Society's Journal, which he held to be incompatible with that rule according to which one of the vice-presidents must retire annually. Now Captain Abney was stated in the Journal to have resigned, and his name was not included among the present vice-presidents, although it was included in the list of members of the governing body who were to retire next month. He held that one of the actual vice-presidents must, according to the rule, retire.

W. ENGLAND, one of the vice-presidents, said that it had been his intention to retire, and then the President stated that he (W. England) as senior vice-president would retire, and there would be two vacancies in the vice-presidency, to fill up at the coming election.

The auditors for the year were then appointed—W. E. Debenham and A. Mackie.

Scrutineers for the next election were also appointed as follows:—G. Davison, J. D. England, A. Mackie, T. Samuels, G. Scamell, and J. F. Shew.

W. F. DONKIN then read a paper on Stereoscopes and Binocular Vision, in the course of which he said that twenty-five or thirty years ago stereoscopes were to be found in every drawing-room, and were as much to be looked for there as a pianoforte; but now they had almost gone out of use. He enquired why these beautiful instruments had become so neglected, and replied that in the first place, sheer laziness had something to do with it. It was easier to turn over the leaves of an album than to adjust pictures and examine them in a stereoscope. Then there were many people who failed to combine the two images. Further, the cheaper instruments were so badly made that the two images could not be properly brought together at all. He was somewhat doubtful if it would ever be revived as a popular instrument, however much he might desire such a result. Turning to the history of the stereoscope, he observed that sixty years ago the theory of binocular vision was not at all understood. Doubtless, many men had recognised the difference between seeing with one eye and seeing with two eyes; but it was not until the year 1830 that Wheatstone and other investigators took up the subject with any completeness. Wheatstone constructed diagrams and pictures, and invented the instrument which he named the stereoscope for showing them. This instrument consisted of two plain mirrors, and two flat boards inclined at such angles that the pictures coalesced to the vision of the observer. Some years later Brewster constructed the refracting stereoscope, which, with the substitution, by Dubosc of Paris, of portions of lenses for prisms, became a popular instrument. This reflecting stereoscope never was.

On the subject of binocular vision it was pointed out that the eye bears a close resemblance to the camera, but had a marvellous power of self-adjustment. The retina was an ever sensitive film, and there were muscles which, by flattening the lens, or allowing it to assume a more convex form, automatically adjusted the focus for different distances. There was also a self-acting iris diaphragm working with apertures of from  $\frac{1}{8}$  to  $\frac{1}{4}$ . The spheroidal curves of the surfaces rendered it free



from spherical aberration, and it was achromatised. The combination of the two dissimilar images seen with the two eyes was effected in the brain rather than in the retina. There was more sensitiveness in the middle part of the retina than towards its edges, but at the centre there was a small spot of insensitiveness. If a very faint star were looked at directly, it became invisible from its image falling upon the insensitive spot. The lower animals did not possess this insensitive spot. The average distance apart of the human eyes is  $2\frac{1}{2}$  inches. By long practice we have learned to combine the two images which the two eyes present to us. Looking fixedly at a near, and then at a distant object, we make two changes in the condition of our eyes. For the near object the optic axes are convergent, whilst for the distant one they are parallel or nearly so; the focussing of the eyes is altered simultaneously with the change of direction of the lines of sight; but these two movements are effected by two quite different sets of muscles. We judge of distance by the change which we thus make; but in ordinary circumstances we are also greatly assisted by aerial perspective, and by other incidental matters. Taking two transparencies, one of double the diameter of the other, made from the same negative, and placing the smaller one at a distance of one foot, and the larger at a distance of two feet from the eye, and looking at them through a tube, a roll of paper which cut off extraneous objects, the two pictures looked exactly alike. There was, however, a difference in the focussing of the eye when looking at the two, and by this single criterion he could tell which was the nearer, and which the farther picture. It was noted as curious that although one eye only was used in this experiment, and the other eye was closed, yet the closed eye could be felt to move its axial direction in sympathy with the focussing exertion of the open eye, and so aided in impressing us with the idea of the distance at which the object is placed. Moving the mirrors of the reflecting stereoscope while we are looking at the pictures, gives the effect of making the picture appear further off, and increase in size; or of being near but smaller, according as the movement of the mirrors necessitates greater parallelism of the lines of light or the reverse. When looking through the stereoscope the dissimilarity of the images gives the idea of solidity and distance, but the change of focussing which is required in looking at real objects is wanting. A theory had been put forward to explain how it was that we saw things as solid, and judged of distance; that the eyes were in incessant motion and kept running backwards and forwards, but this was not altogether true; as it had been proved by Dove that the light of an electric spark, or that of a flash of lightning, sufficed to show objects at their relative distances, and it was inconceivable that the muscles of the eyes could move so rapidly as this would require them to do. Le Comte had formulated a theory that one judges of distance by seeing farther objects homonomously—that is, that with the right eye they appear more towards the right hand, and with the left eye they appear more towards the left hand; whilst nearer objects are seen heteronomously—that is, that they appear with left eye to be more towards the right hand, and with the right eye more towards the left hand. It appeared to the lecturer that Le Comte is right up to a certain point, but there is a limit to our investigation; at a certain point material gives way to mental ability. It is incomprehensible, and must ever remain so.

W. ENGLAND, who had taken the chair on the retirement of the President, referred to the enormous number of stereoscopic pictures that had been produced at one time. He thought that the climax of its popularity was reached in 1862.

—CHADWICK showed a small camera, which also served as a stereoscope by inserting a glass transparency in the place of the focussing screen. He also said that he used single lenses to take the negative, and by using the same lenses to make the transparencies any distortion in the original negative was remedied.

W. E. DEBENHAM said that images given by a single lens at its ordinary focus, and showing distortion, would only have that distortion partially remedied by copying with the same lens when drawn out to double its ordinary focal length for copying of the same size.

J. T. TAYLOR thought that one reason of the decline of popularity of the stereoscope was the very faulty manner in which many stereoscopic pictures had been mounted. This was often done so that it was impossible to get the image to combine in any stereoscope in his possession. The distance of the two pictures, measuring from some principal object in each, should not be more than  $2\frac{1}{2}$  inches. Thus, in order to get relative stereoscopic effect, the pictures should be so cut as to appear to be

behind the mount, that is, a little more of the left side of the subject should be included in the picture that was looked at with the right eye, and *vice versa*. He would direct Mr. Donkin's attention to a particular photograph which he then held in the stereoscope. In order to get the proper effect of perspective with it, it was necessary to start the stereoscope upwards, and throw the head back. This was a curious physiological fact. As to the effect of retouching on stereoscopic slides, you might retouch one of the pictures and not the other, and they would combine perfectly. Another curious thing was that in order to get the beautiful sheeny appearance seen on some shells, these were in the slide he now produced painted of one colour—blue—in one picture, and of another colour—pink—in the other.

J. SPILLER showed three stereoscopes, one of the simplest form being portions of a lens set in a copper wire framing for use like a pair of eye-glasses. Another was one in which whole lenses were used; this was introduced by G. Wharton Simpson many years ago. A third, which he considered the most perfect, consisted of a frame with a travelling rack for the picture, and a pair of prisms with large shades for the eyes. It was of American manufacture.

W. ACKLAND thought that a decided improvement in stereoscopes was that introduced by W. Harding Warner some years since, when he produced what he called the panorama stereoscope, in which views  $5\frac{1}{2}$  inches in height were used instead of the usual short pictures. There was also a double-action lever, by which the lenses could be divided, or brought closer together.

W. BLANCHARD said that Smith and Beck long since made stereoscopes with whole lenses.

T. SEBASTIAN DAVIS disagreed from J. T. Taylor's statement that pictures should not be mounted at a greater distance than  $2\frac{1}{2}$  inches; he considered that sufficient angle could not be included if this rule were adhered to.

After a vote of thanks to the Lecturer, the meeting was adjourned to Tuesday, February 13th.

#### NORTH LONDON PHOTOGRAPHIC SOCIETY.

At the usual bi-monthly meeting, held at Myddelton Hall, Islington, on January 3rd, the President, J. TRAILL TAYLOR, occupied the chair.

After the usual routine business, William Bishop, John Douglas, and E. M. Groundwater, were elected members of the Society.

The PRESIDENT showed a gelatino-bromide transparency made fifteen or sixteen years ago, probably one of the first ever made by this process. It was clear and of good tone, and showed no deterioration from age.

A. P. HIGGINS passed round specimens of prints on Alpha paper. One of these was printed from a negative taken by the magnesium flash, and showed traces of movement in the eyelids of the sitter.

Mr. TAVERNER brought some negatives and transparencies developed with hydroquinone. The results were not altogether satisfactory, a multitude of black spots and other imperfections being evident.

W. BISHOP exhibited some prints on Obernetter emulsion paper, and also a very simple and ingenious lamp for burning magnesium powder. This consisted of a square spirit reservoir carrying two large wick tubes; at one side of the lamp a small wide-mouthed glass bottle, containing magnesium powder, was fixed; the cork carried two tubes similar to a wash bottle; to one of these tubes a rubber ball was attached, while the other tube pointed into the lamp flame. Sufficient magnesium was projected into the flame by compressing the ball, while suction of the powder into the ball itself was prevented by cutting a hole in the ball and covering it by the thumb when puffing the powder out, and then immediately removing the thumb from the aperture. Mr. Bishop said that he placed the sitter eight or nine feet from the light, and that no reflectors were used in the production of the specimens shown.

The PRESIDENT congratulated Mr. Bishop on his invention, and said that the lamp would be welcomed by many who did not care for an explosive addition to their magnesium powder. He would be glad to know if the lamp was to be introduced commercially.

F. W. HART said he was willing to manufacture the lamp, and offered to devote a proportion of the profits to the funds of the Society.

L. MEDLAND referred to the difficulty of keeping collodio-bromide film on the glass. He had used successfully an edging of gelatine with a dusting of talc before finally polishing the plate.



The PRESIDENT said that the talc alone would be sufficient. An edging of tallow on the film before development would in many cases prevent slipping.

The optical lantern was then brought into operation, and slides by Messrs. Few, Clifton, Collins, Medland, and the President, were exhibited. A Sciopticon fitted with Edwards's patent dissolver was used on this occasion.

The proceedings terminated with a hearty vote of thanks to those who had contributed to the evening's entertainment.

The next meeting will be held on Tuesday, January 17, when the discussion will be on "Toning and Fixing."

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The ordinary weekly meeting was held at Masons' Hall Tavern on Thursday, the 5th inst., A. P. HIGGINS in the chair.

Negatives that had been redeveloped with the formula recommended in the last issue of the ALMANAC for intensification were handed round by J. B. WELLINGTON; the plates used were slow gelatine, and had been purposely over-exposed; the negatives showed but little trace of this. He (Mr. Wellington) stated that really good pyroxoline suitable for emulsion for transparencies was not readily obtainable always, and he passed round some slides showing a very foggy appearance as the result of a bad sample of cotton. He had proved this to be so by making another emulsion exactly in the same way, but using fresh pyroxoline, which turned out well in every respect.

W. E. DEBENHAM remarked that it was possible that less care was taken now in the manufacture of pyroxoline in many cases than formerly, when collodion was more in demand.

J. B. WELLINGTON said he had tried celloidine for the same purpose, and had succeeded fairly well.

The CHAIRMAN stated that some Alpha paper he had developed recently was left in the acid bath, which had the effect of nearly destroying the image. He passed round a case of Faber's pencils and stamps, which he thought would prove useful for retouchers.

J. TRAILL TAYLOR was of opinion that the artificial light of the future for portraiture would be conveniently carried in the pocket, a screw-top spirit lamp, and small bottle containing magnesium, being all that was required. He was induced to make this statement after a demonstration he had recently seen with the flashing light. A wide mouth bottle is partly filled with magnesium powder, two tubes inserted through the cork, one tube reaching nearly to the bottom of the bottle and bent at the top, the other being shorter; to this one is attached a pneumatic tube and ball, which, on being pressed, forces some of the powder out of the bottle through a spirit lamp, in line with the bent tube, a brilliant flash being the result.

It was subsequently announced that F. Hart was perfecting an apparatus on this principle, and would exhibit same at the next meeting, when groups of the members present would be taken.

A question was asked if insolubility of a film of emulsion made any appreciable difference to the image.

W. E. DEBENHAM said it had been stated, in course of discussion on the subject, that chrome alum made the plate slower and the image weaker. He had not found it so in his experience. Plates treated with chrome alum developed just as quickly, and with same vigour; he used  $1\frac{1}{2}$  grs. to 10 grs. of emulsion.

A. COWAN said using chrome alum after fixing rendered the film insoluble; if used in emulsion, the film became horny, and was very liable to tear or peel when a plate was cut into smaller sizes.

J. TRAILL TAYLOR said he knew of plates made for an American firm, specially for tropical climates, that would stand development with a tepid developer by being rendered insoluble. The quality of the plate was not impaired in consequence. Good, plucky negatives could always be depended upon.

W. COBB stated that plates not liable to frill in the first instance would be improved by keeping. A kind of quality was imparted to them that freshly-prepared plates did not have.

#### CAMERA CLUB.

On Thursday, January 5th, a paper contributed by Rev. F. C. LAMBERT, entitled "Pheidias and Photography," was read and discussed. W. A. GREENE occupied the chair. Owing to illness Mr. LAMBERT was unable to be present, and the paper was read by one of the Hon. Secs. The paper gave a concise account of the development of Greek Art in Sculpture to its highest

point in the work of Pheidias and Praxiteles, and was illustrated by a set of thirteen photographs showing examples of successive stages in the development. Photographers who desired to use their photography to give expression to the beauties of nature were strongly advised to undertake a study of Greek Art.

Some discussion and conversation followed the reading of the paper.

### Talk in the Studio.

PHOTOGRAPHIC EXHIBITION AT THE CRYSTAL PALACE.—S. G. B. Wollaston writes:—I send you a list of the Judges, which, I think you will agree with me, is a representative one. We are getting on well. The list is as follows:—W. Bedford, T. Bolas, J. Brocks, W. J. Chadwick, Lionel Clark, F. Cobb, Seymour Conway, G. Davison, W. F. Donkin, T. Fall, E. W. Foxlee, F. M. Good, H. Harben, Charles Hastings, F. Hollyer, F. Howard, Paul Naptel, R.A., Payne Jennings, Andrew Pringle, Sir David Salomons, Bart., E. R. Shipton, H. Sturme, Traill Taylor, Trueman Wood, B. Wilkinson, Junr., J. B. B. Wellington.

CAMERA CLUB.—Meeting Thursday, January 19th, 8 p.m. Paper by Capt. Abney, on "Winter Photography."

PHOTOGRAPHIC CLUB.—The subject for discussion on Jan. 18th will be "Defects on Negatives resulting from Faults in Commercial Dry Plates."

### To Correspondents.

•• Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER AND CASTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

R. D.—The Ross view lens you refer to would be likely to fetch about 18s. at a sale in London.

G. JAVIES.—Something has come in contact with the print which has oxidised or chlorinated the silver.

JAMES FLEMMING, junr.—We do not think you will obtain the paper ready sensitised. See leading article of last week, and of this.

LEX.—The nitrate is, perhaps, the more convenient salt, as it is more easily soluble in alcohol.

DAVE.—1. Those ordinarily in use will answer for the process; but a moderately quick lens is desirable. 2. The material is, we believe, not yet on sale in this country. Write to the Eastman Co., 13, Soho Square, London, W.

CHARLES REYNOLDS & Co.—All this has been said before; and we cannot fill our columns with repetition of statements already made. You know very well that you cannot prevent the sale of the article by anyone who purchases it.

H. COLEBROOK.—"Wilson's Quarter Century of Photography" is an excellent book, and you can order it through Trubner, of Ludgate Hill: 2. The yearly subscription to the News is 15s.; quarterly, 3s. 10d.

C. C. LYON.—The portrait is very successful, and you probably will be able to introduce the process with advantage.

W. J. BYRNE & Co.—We certainly cannot announce that the negatives are "wonderfully successful" unless we have personal knowledge that they are so, and, in fact, we never insert puff paragraphs sent by interested parties. Should you send the photographs themselves for notice, and we consider them worthy of mention, we shall say what we think about them.

R. E. COLLINS.—See the YEAR-BOOK, and use the "flash light" there recommended.

P. SWANSON.—Thanks, it is at hand. You shall have proof.

W. J. DIGGINS.—It is merely a question of the so-called combination printing. See Robinson's "Pictorial Effect in Photography," 2nd edition.

E. H. TALHOT.—It has been forwarded.

W. H. WHEELER.—Received. Next week you shall have a proof.

FRANK DIXON.—Next week.

W. REDAWAY.—1. We much prefer pyro in this case; best in the form of Beach's sulphite developer as described in the YEAR-BOOK. 2. We consider them no more permanent than other silver prints of the same kind, but our publishers do not exercise control over such statements by advertisers. 3. The stripping films.

J. P. G.—Thanks. Next week.

CHAS. COLLIS.—The publishers tell us it was sent on the 28th, and so we may assume it was lost in the post. Still, they will send another.



# THE PHOTOGRAPHIC NEWS.

Vol. XXXII. No. 1533.—January 20, 1888.

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### THE ILLUMINATION OF THE NEGATIVE FOR COPYING WITH THE CAMERA.

THIS subject, which lies at the root of most enlarging work besides negative reproduction by direct copying, is ably treated of by Dr. Stolze in a recent number of the *Photographisches Wochenblatt*, and we propose to discuss the subject from our own point of view, and also to reproduce the substance of some of his remarks.

It must be remembered that the conditions of illumination to be considered are those which obtain in all cases where a transparent original—whether a positive or a negative—is copied by a lens; the enlarging room being often virtually the camera, so that the matter has a wide significance in relation to the everyday work of the photographer.

Now we may take it that as a general thing the professional photographer prefers to work by daylight—not only because it is more economical, but also because he generally finds that to work at his occupation all day is quite enough, without trenching on the evening hours. Consequently, daylight methods of illumination have more special interest for the professional worker; while the amateur is more specially interested in lighting up the original by artificial light—generally, indeed, a petroleum lantern of the “Sciopticon” type being used, either with or without a diffusing medium, behind the original to be copied. We propose now to deal more especially with the illumination of the original when daylight is to be employed; but much we shall have to say under this head will be found applicable to work with the lantern, provided the reader grasps the main differences of the situation.

Perhaps, of all things, the best is to direct the copying system so that behind the original to be copied we have a compact mass of white clouds—a mass of white clouds large enough to fairly cut the imaginary pyramid of which the apex is the lens, and the edges of which are lines starting therefrom, and passing through the corners of the original to be reproduced. It is not often, however, that these conditions can be secured—and, indeed, very seldom, unless the whole enlarging system can be tilted and turned in any direction—things quite out of the question when large work is to be done. An imperfect substitute for tilting is a hinged mirror on the light side of the original to be copied from; but still, the possibility of turning the whole system in any horizontal direction must exist.

The necessity for an evenly-lighted background beyond the original to be copied (putting aside for the moment all work with the aid of condensers) will be readily understood if we suppose the original to be a piece of clear glass, the correct reproduction of this being an even tint on the plate when developed. Should the background be uneven—let us suppose partially covered with a cloud—the

image of that cloud, although out of focus, will show on the sensitive surface, unless, indeed, the adjacent sky happens to possess the same actinic quality as the cloud. The same thing happens when a negative is to be copied, only oftentimes the image of the cloud may be so faint as to present no serious disadvantage in the work. Indeed, enlargers frequently consider it sufficient for transparent originals to be directed towards any piece of sky or towards the reflection of the sky in the looking-glass.

Perhaps the very best source of light towards which the lens can look—the original to be copied being interposed—is a large white screen upon which the sun shines, and provided this is uniformly white, and completely covers a section of the imaginary pyramid referred to as having its apex at the objective, this method of working is unexceptionable: and, indeed, the same method of working is available when there is no direct sunshine, the white screen receiving its diffused light from the sky. Only in this instance the screen must not be partially shaded by terrestrial objects.

The screen used may be a piece of white canvas stretched on a frame and mounted somewhat after the fashion of a swing looking-glass. This stands out of doors, and is adjusted in front of the original to be copied, which original is set in the window of the dark room. Inside the room one wants virtually a camera, although in the case of larger work the body of the camera is dispensed with.

Far less trouble, and often satisfactory, is the method of mounting the negative in the window of the dark room as before mentioned, and placing a piece of fine and uniformly ground glass about an inch from it, on the outside; then beyond this first ground glass and two or three inches from it a second sheet of ground glass, rather coarser than the first. In ordinary cases these glass screens break up the light received from the sky quite sufficiently to obliterate the images of any terrestrial object towards which the system may be directed; but far longer exposures are ordinarily required than when the reflector is used.

Equality of illumination is the principal point to be attended to when true work is required, and by attending to the points just laid down, equality of illumination may be secured; indeed, far greater equality than one can hope to attain by using a petroleum lantern of the Sciopticon type, as the source of light. In this case the flame is so large, and so irregular in shape, that those optical conditions necessary for equal illumination can only be realised very imperfectly; but when the lime light is used, and the spot of light is small, and tolerably round, no difficulty should be experienced, provided the condenser, the light, and the objective are so arranged that the image of the light cast by the condenser falls close to the optical centre of the objective.



## THE ROTATING CYLINDRICAL ACTINOMETER.

BY D. WINSTANEY.

In order that I may continue my experiments in actinometry, I have just constructed another cylindrical actinometer, similar to the one described on page 709 of last year's volume of the PHOTOGRAPHIC NEWS. It differs, however, from that instrument, in that the outer cylinder revolves, whilst the inner one is fixed; that the whole affair is smaller, and is held in the hand when being used.

When the outer cylinder is fixed, and the inner one revolves, it will be seen that a given portion of the paper is not necessarily exposed exactly in proportion to the width of that part of the slit under which it passes. At the wide end there is a slight obliquity of the impinging rays at emersion from, and at immersion into, obscurity which is not experienced at the centre of the transit. The amount of this obliquity is very slight, and its results are very likely imperceptible. Still, as there is no reason for its existence, I have avoided it in the new instrument, and by the device which I have named.

The following are the dimensions of the new arrangement:—

Length of inner cylinder, including cap, 4.4 inches.

Diameter of ditto, 2.65 inches.

Length of outer cylinder, including cap, 4.6 inches.

Diameter of ditto, 2.8 inches.

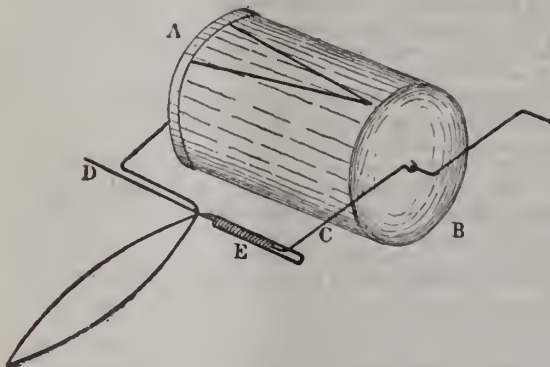
The length of strip produced by it is 3.7 inch.

The largest width of slit is one inch exactly, and the inclination of the lines which form its longer boundaries would cause them to meet at  $4\frac{1}{2}$  inches exactly from the base.

The weight of the apparatus complete, and ready for use, is  $9\frac{1}{4}$  ounces.

The following figure shows the details of its construction.

The wire ( $\frac{1}{8}$  inch diameter) which penetrates the end of the outer cylinder at A, and is soldered to the cylinder within, is bent to and fro to form the handle, by which it



is held in the left hand when used. The spindle of the winch at B is held by a U-shaped loop on the wire C. This wire, terminating at the end D, slides tightly in the wire work wrapping seen at E after the manner of a bolt. To use the instrument this bolt is first withdrawn until the U-shaped loop comes in contact with the winch. It is then rotated downwards on the axis D, which was not possible before. The end B of the cylinder is then clear, and the cylinder itself is removed from the cap at A, and the inner cylinder is left bare. Round this the silvered paper is secured by gummed paper at the meeting ends. The outer cylinder is replaced, the U-shaped loop is rotated back to hold the axis of the winch, and bolted "home." The apparatus is then taken from the yellow room into the light of day, preferably into sunlight—for which I am waiting now—and there it is rotated and the strip exposed. The winch inserted into the outer cylinder end, with its

principal bend in a direction almost at right angles with that of the positions of the slit, is brought to a stand parallel with and close by C, and accordingly with the slit downwards, and opposite the joining of the silvered paper band.

Since writing the above I have had a little sunshine, and made a strip which now awaits the fixing with some others procured by different means. The apparatus works in a satisfactory way, and, from the clearness of the principles involved in its construction, is the one which I shall use to test other instruments presently to be described.

## WOODEN DISHES.

BY J. H. BIGGS.

THERE are objections to all the several kinds of dishes obtainable from dealers for developing, washing, fixing, and other operations connected with the production either of negatives on glass or paper, or of positives by enlargement or contact printing. The glass dishes are very liable to fracture, and for large sizes are very heavy and cumbersome, faults equally existing in those of porcelain, which are also often defective in the glazing. Ebonite is very brittle, and the composition trays soon become damaged by the chemicals used, while all are expensive to purchase.

Doubtless many amateurs are deterred from making enlargements by the outlay required in obtaining dishes of a much larger size than those they have in use for producing negatives, and it is to aid these that I recommend the use of dishes which I have found most efficient and cheap, and purpose describing, as clearly as possible, how they may be made in such a way as to ensure success.

If the amateur is possessed of sufficient mechanical skill to make a neat wooden box, he may do the work himself readily; but if he is unable to handle fairly well a few simple wood-working tools, it may be necessary for him to appeal to an ordinary joiner or carpenter. The materials required for a 13 inch by 11 inch tray will not cost more than eightpence, and the directions I give will be for one of that size. For larger dishes it will only be necessary to increase slightly the thickness of the stuff, and to use larger screws. The wood to be used is American yellow pine, and the amateur must be particular that he gets the proper thing, as this wood is especially suited to this purpose, being soft and easy to work, while it warps less than any wood I know of, and is very light, and not liable to split. Vendors of wood will probably try to palm off other pine on the purchaser unless he knows the true wood when he sees it; as this has happened to myself only recently, where the wood sent to me in two instances, in answer to my order for American yellow pine, was of a totally different nature.

For a dish the bottom of which is to measure 13 inches by 11 inches, take a piece of the pine half an inch thick when planed on both sides, and cut it into a true rectangle of that size, the grain running lengthwise; then, with a sixpenny iron plane, the cutter of which is very keen, bevel the edges to the desired angle all round, by holding the wood in a vertical position with the edge to be cut uppermost, and cutting away the part which is to be at the under side of the bottom. This is to make the sides of the dish slope outwards towards the top, and the degree of slope being previously determined upon, a gauge is made of thin sheet metal or cardboard to test the bevelling as the work proceeds, and to ensure its being of the same slope all round. In doing this bevelling, cut the ends of the bottom board, where the plane is worked directly across the grain, first, and then the sides which run with the grain. The bevel being cut evenly and truly on all the four sides, the wood will present a rectangle of 13 by 11 on the upper side, which is to form the bottom of the inside of the dish, and a rectangle of smaller size on the



opposite or under side, while the sides and ends will form acute angles with the larger, and obtuse angles with the smaller rectangle. The next step is to take two pieces of the pine each, 16 inches long by  $2\frac{3}{4}$  inches wide and  $\frac{3}{4}$  inch thick, the grain running lengthwise. These being made true are to be fastened to the sides of the bottom board by about six  $\frac{3}{4}$ -inch screws in each, so that the lower edges are exactly flush or even with the under side of the bottom, an equal quantity of wood being left projecting at each end. Let the heads of the screws be counter-sunk, so as to lie even with the surface of the wood, and let them be well screwed home.

The dish has now two sides, which slope outwards to the top. For fitting in the end pieces neatly and firmly, it will be well to make a sloping groove at each angle in the sides for the end pieces to fit into, although some dishes which I have made without this provision have been perfectly sound.

Place a straightedge against the bevelled end of the bottom at one corner, and lying flat on the side piece; then, with a very sharp penknife, cut a faint line across the side piece in prolongation of the end bevel. Do the same at each of the other three corners. Now cut out two pieces to form the dish long enough to reach across from the top of the two side pieces, and  $\frac{1}{4}$  inch more. These must also be  $\frac{3}{4}$  inch thick, but they must be  $\frac{1}{4}$  inch wider than the side pieces, and must have the grain running across instead of lengthwise. The object of this latter is to keep the grain running in the same direction throughout, so that, if the wood expands or contracts, it may do so freely, and without danger of bursting or splitting or opening the seams. Place the end of one of the cross-grained pieces even with the line cut at one of the angles, and resting against the end of the bottom board. Then draw another faint line with the penknife, marking the thickness of the end piece ( $\frac{3}{4}$  inch); this is for making the groove for the end piece to fit into while it lies flat against the bevelled end of the bottom board. With the straight-edge and sharp knife cut by repeated strokes with the point to a depth of  $\frac{1}{4}$  inch along each of the lines marked, taking care to make the distance apart, if anything, a trifle less than the thickness of the end piece, as it will be better to reduce that slightly to cause it to fit in, than by making the groove in the least too large, to have to fill up the gap. Two additional lines cut to the same depth between those already mentioned will make it easy to cut out the wood to form the groove, which should be done as truly as possible. Go through the same operation at each corner, and cut each cross-grained end piece in such a manner that, while each end is sloped away equally, the top edge shall be just long enough to reach the depth of the groove at the top of one side piece to a similar place in the opposite side piece, while the under or lowest side must be long enough to fill in from groove to groove in the lower ends of the side pieces. Fit these parts in as neatly as possible, using coarse glass-paper stretched flat on a board to rub down where only a slight reduction is required, but be careful, in doing this, not to round the edges, which should be kept as true and sharp as possible.

I may here mention that there is no real necessity for even using a saw in cutting the wood for making a dish of the size named; it can be easily cut by repeated strokes with a sharp penknife held in a nearly vertical position, and drawn along a straightedge either with or across the grain. In the latter case a cut being made from each side, and the small plane afterwards applied, will render the cut true and clean. The end pieces are to be fitted so that, when lightly forced into their places in the grooves, the upper edges will be even with the tops of the side pieces, their lower edges projecting  $\frac{1}{4}$  inch below the bottom board, and so forming a support at each end for the dish to stand upon. Longer screws are now put through the end pieces into the bottom board about  $1\frac{1}{2}$  inches apart, and two thin screws  $\frac{3}{4}$  inch long are put

through the side pieces at each angle into the cross pieces, holding all the slides firmly together. A spout is made at any corner desired by screwing a piece of wood  $\frac{3}{4}$  inch thick against one of the side pieces in the angle outside the dish, even with the top, and then scooping out a semi-circular channel. In the dish as now formed, the side pieces project considerably beyond the ends, and some of the superfluous wood may be cut off, but it is not advisable to cut much away, or to leave less than half an inch beyond the grooves in the side pieces. The plane may be used to make the upper edges true and even, and corners may be rounded a little, after which the work should be made as smooth as possible with glass paper.

Now follows the important operation of making the wood impervious to water, and fit to assist the action of any chemicals which may be used in it, this being effected by thoroughly imbuing it with solid paraffine. Make the dish hot and dry, and place in it some pieces of paraffine, then apply a hot smoothing iron, and guide the fluid paraffine all over the wood, giving it plenty of time to soak in. Do this both inside and outside, and when cold scrape off all excess of paraffine, and rub well with a coarse cloth.

The American yellow pine is generally procurable in boards 14 inches wide, but where it is required to make a dish wider than the wood it will be necessary to have joinings in the bottom and end pieces, which, if accurately fitted, will not impair the efficiency of the dish, but as an extra precaution against the seams coming apart a brass rod having a head at one end, and a short screw with nut at the other, may be passed through the projecting ends of the side pieces at each end of the tray, by which the whole may be held firmly together.

## LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTION.

BY CHAPMAN JONES.\*

CHAPTER XVII.—DEVELOPMENT WITH FERROUS OXALATE—THE ACTION OF THE RESTRAINER AND THE ACCELERATOR—DEVELOPMENT WITH PYROGALLIC ACID—THE ALTERNATIVE ALKALIES—SUPPOSED POISONOUS NATURE OF AMMONIA.

THE production of a negative consists in the main of two operations, the exposure and the development. Concerning exposure we have already considered the main points in connection with lenses, and it only remains to say that for a good negative of a not exceptional subject, the exposure must be ample, and the one thing to be feared is not over, but under-exposure.

There are two methods of development at present in vogue for gelatine plates, the reagents used being ferrous oxalate in the one case, and pyrogalllic acid with an alkali in the other. The first method is undoubtedly the simplest, but the second is certainly the most useful.

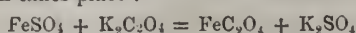
Ferrous oxalate is a yellow powder obtained by warming a mixture of solutions of ferrous sulphate and oxalic acid. Chemically expressed it is oxalic acid ( $H_2C_2O_4$ ) with its hydrogen replaced by iron ( $FeC_2O_4$ ). It is practically insoluble in water, but dissolves to a certain extent in solutions of alkaline oxalates, that is, the oxalates of potassium, sodium, or ammonium. Of these the oxalate of potassium is preferred, because it yields a stronger solution than either of the others. The oxalate of potassium used must be the neutral oxalate, and this salt, as purchased, may be sufficiently distinguished from the other oxalates of potassium by its turning reddened litmus paper blue. For use, a saturated solution of potassium oxalate is required, and this is conveniently prepared by shaking the powdered salt with three times its weight of water. This solution will be alkaline, and should be made just acid by adding a strong solution of oxalic acid drop by drop as required, or

\* Continued from page 819, vol. xxxi.



a little of the finely powdered acid itself. The solution is then filtered, and will keep indefinitely.

The most powerful developer is made by adding solid ferrous oxalate to the boiling solution, prepared as above, until no more is dissolved, and allowing the solution to cool in well-corked bottles. Or, instead, the yellow oxalate of iron may be shaken with the cold potassium oxalate solution at intervals during two or three days. But the most convenient form of this developer, though weaker than either of the above, is made without the prepared ferrous oxalate at all, by simply adding a slightly acidulated solution of ferrous sulphate ( $\text{FeSO}_4$ ) to the potassium oxalate solution. The maximum amount of the saturated ferrous sulphate solution is one-third the bulk of the potassium oxalate. If this amount is exceeded there is not a sufficient excess of potassium oxalate to hold the ferrous oxalate that is formed in solution, and a yellow deposit of ferrous oxalate is likely to disfigure the negative. It is much to be preferred to always use at least four times as much potassium oxalate solution as of the ferrous sulphate solution. When these two salts are mixed the following reaction takes place:—



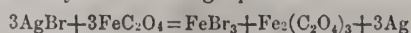
The potassium sulphate is useless, but appears to be inert.

In the actual development of landscape negatives, it is better to add the ferrous sulphate solution in smaller portions, beginning, say, with a quarter of the whole amount that it is allowable to add; but there is no need for this precaution if the exposure is known to be suitable for the prepared developer, as is generally the case in portraiture, copying, &c. If, however, the operator wishes to make the very best of any negative from nature, portrait or landscape, he must begin with a weak developer, so that the detail in the most illuminated parts may be well developed, and then gradually increase the strength of the developer to suit the shadows; otherwise the detail in the lights will be sacrificed more or less, as the clouds are in ordinary landscape work, by over-exposure.

For outdoor work, a little potassium bromide is generally necessary as a restrainer, but it must be sparingly added except when exposure has been needlessly prolonged. It may also be used in studio work, though some operators consider that a finer quality of negative is got if it can be dispensed with. The way in which potassium bromide acts is not known, but it seems probable that it attaches itself in some way to the bromide of silver, and so makes the molecules heavier, more stable, and more difficult to attack by the developer.

A maximum of about ten drops of a two-grain solution of hyposulphite of soda may be added to each ounce of the developer to quicker development, and so avoid hardness in cases of under-exposure. The action of the hypo in this case is also unknown, but it may be that by its solvent action upon bromide of silver it brings this into a more intimate contact with the developer. Other explanations have been suggested, but they do not appear to meet the case.

The action of the ferrous oxalate upon the silver bromide is expressed by the following equation.



and as the ferric salts produced have a directly opposite action to the ferrous salts, the developer does not merely lose strength as it is used, but the amount of restrainers increase at the time when they ought, for a perfect result, to diminish. This is a theoretical disadvantage inherent in the ferrous oxalate developer, and the writer believes that the careful operator will find that it is also a practical disadvantage, giving a diminution of gradation in the high lights, or in the deep shadow, or in both.

Why a certain amount of light should quicken the action of the developer, and enable it to reduce the silver salt, while in the absence of any light effect it would

remain unchanged under the developer, is still a problem. Many suggestions have been made, but none have sufficient evidence in their favour to entitle them to unqualified acceptance. It is argued on the one hand that the chemical decomposition is started by the light, and on the other hand that the effect of light is not chemical, but that it causes physical change that facilitates the action of the developer.

Development with pyrogallol acid in solution with an alkali has the advantage of giving the operator more power to vary his developer to suit the peculiarity of his subject, and a greater convenience in making such changes as may be necessary during development. There is also no deposit of oxalate of lime when common water is used.

The pyrogallol acid is conveniently kept in the solid condition, as its decomposition is then entirely prevented, and it is as easy and rapid to measure the solid substance as a solution of it. The strongest ammonia (s.g. '880) may be mixed with nine times its measure of water, so that ten minims contain one minim of the strong solution; but the writer prefers to mix it with only four measures of water, as half the number of drops are here required in any developer, and these can be dropped out in half the time. For the same reason he prefers a 20 per cent. solution of potassium bromide, though a 10 per cent. solution is often recommended. Bromide of potassium is to be preferred to bromide of ammonium, as being of more constant composition. If carbonate of sodium is to be used, the pure dry salt should be purchased (dry, that is, freed from its water of crystallization) and a 10 per cent. solution made. A 20 per cent. solution will deposit crystals in cool weather. Carbonate of potassium should also be purchased dry, and may be made into any strength of solution up to 50 per cent. To make these solutions of definite strength, the amount of water required cannot be measured out beforehand, but the bulk of solution when finished must be 10 measured ounces if one ounce of solid is to give a 10 per cent. solution, and so on. Sulphite of soda is also required, and a 20 per cent. solution of this salt is convenient, though it may be made stronger if desired. The precautions necessary in preparing, purchasing, and dissolving this salt have been already pointed out, therefore it is only necessary to repeat here that the solution must be made just acid with citric acid. Sulphurous acid would be better, but the solution of it, as sold, is generally not pure enough; sulphuric acid should not be used.

The advantages of the alkaline pyrogallol acid developer are of such a nature that it is impossible to teach the manner of using it in a lecture or an essay. The end justifies the means, but an imitation of the means will not secure the end. Just as in a game of chess, the master almost always wins and the tyro almost always loses, though both have equal chances to begin with, so it is in development. In chess, too, the tyro, unless he is careless, probably cannot tell why he loses nor why he sometimes wins, and his chief study is to localise his faults. So in developing, the reason of failure must be got at, however laborious the process, that it may be well recognised and conquered. The reason why so few can develop while so many practise photography, is that the popular notion regards the inherent difficulties as so many ninepins to be overcome with one swing of the foot; and having attacked the difficulties in this manly spirit, they easily persuade themselves that they are masters, and that their productions are masterly.

In studio portraiture as often practised, development is no more an art than the fixing and varnishing of the plate; indeed it is actually possible to apply always a uniform developer for a uniform time, and to secure what is wanted by suitable arrangements in the lighting, exposure, &c. But in landscape work the thing is wholly different. The range of light intensities varies in every view, and in every view it varies from hour to hour, and from day to day. The view cannot be varied to suit the developer, therefore the development must be done to suit the view, and it is in



this that the art of development lies. Even a rapid glance at published landscape photographs reveals the fact that a large proportion of them are only partially developed, and that in general the development has been done by rule-of-thumb. These pictures are good enough to sell, or they would not be made; but so also, doubtless, are new oil paintings about ten inches by eight inches just now offered in some retail shop windows for one shilling each.

The statement that a certain formula of development is that best suited to a certain make of plate is therefore only a guide to the nature of the plate. The process of development must be suited to the given subject taken on the plate employed. The chief use of a maker's formula is to show the maximum amount of ammonia (or other alkali), and the minimum amount of bromide and pyrogalllic acid, or in other words, the most trying developer that it is advisable to employ, or that the maker will guarantee his plate to bear; but these limitations will stand for little with the experienced operator.

Some prefer to use carbonate of soda or carbonate of potash, or a mixture of the two, instead of ammonia. It appears that in so doing one sacrifices a measure of controlling power, and gains a little in not suffering so much from the bad results of carelessness. Carbonate of potash tends to give detail, carbonate of soda density. It is considered that carbonate of potash will develop detail that ammonia would not get. Some consider that these alkalies have less tendency to stain than ammonia, especially with paper-supported gelatine films; but the writer's experience is the reverse of this. He has found that ammonia, with a less amount of sulphite of soda than specified for use with carbonate of soda, would develop paper negatives free from stain; while the use of carbonate of soda on films similarly exposed on the same subject made the use of a clearing solution necessary. But much stress must not be laid on these facts, as the personal element is so important an item in development. An eminent photographer has said that he never got anything with soda or potash that he could not have got with ammonia, but that ammonia has given him what the other alkalies would not have secured.

Concerning ammonia as used in developing being prejudicial to health in the average human subject, every man's occupation, probably, is more or less prejudicial to health, whether he be a professional diner out, a physician, or a mechanic. The man whose first aim in life is to preserve his health, is a chronic invalid; with the average healthy subject duty comes before health. The writer considers that the chief evil connected with developing is the non-ventilation of the dark-room. A lofty, well-ventilated, and well-lighted apartment for developing in would probably do away in most cases with all the evils ascribed to the use of ammonia. As to the effect of ammonia pure and simple upon the system, it is interesting to note that Dr. B. W. Richardson has administered five minim doses of strong ammonia every half-hour—that is, as much as the patient could well take—and continued the treatment for several days. He says that it “caused no unpleasant symptom,” and that “the ammonia, however far it may, with reason, be carried, does no injury that is not quickly recovered from.” It appears to the writer that it would be far more reasonable to banish the chromates, which are poisonous, from the photographic world, so of course putting an end to carbon printing, and almost all the photo-mechanical processes, than to exclude ammonia because some individuals find that it is inconvenient.

(To be continued.)

## NOTES ON THE MAGNESIUM LIGHTS.

BY P. SWANSON.

In response to the Editor's request, I subjoin a few jottings on some of my experiments which were conducted

during the last eight years, with magnesium light as a substitute for daylight for the purpose of taking negatives.

In the winter of 1880-81 I suggested to some of my photographic friends in the south, that a mixture of black antimony, potass nitrate, and magnesium, either in the form of powder or ribbon, would be a very efficient light to use in the Luxograph, which at that time was very popular among some members of the black art.

In the winter of 1884-85 I devised several different kinds of apparatus for burning magnesium, both in the form of powder, and also in the ribbon form. A sketch of one of these was sent to London. Whether one was constructed or not, I do not know.

Its principle may be briefly stated as a series of ordinary gas jets placed one above the other. By turning a handle these jets were transformed into Bunsen burners. The object of this arrangement was to ensure the more perfect combustion of the magnesium powder, which was dropped into the flame from above. I do not think this is of sufficient interest to make a sketch of, but if it be I shall send you one.

During the same winter I constructed another piece of apparatus somewhat on the principle of the McLellan lamp; that is, magnesium ribbon was burnt in a globe containing oxygen sufficient for three or four exposures. This apparatus had all the bad qualities of the ordinary pyrotechnic lamps of the Luxograph type. Their weak point is so well known that it is almost needless to mention it. However, as we read some extraordinary statements about the roundness (!) and beauty of pictures taken by the flash light, it may not be out of place to state emphatically, for the benefit of the uninitiated, that it is absolutely impossible to get a negative with the qualities of roundness and brilliancy combined, by any lamp or flash where the light emanates from one point. True, a considerable improvement may be effected by the use of translucent materials placed between the sitter and the source of light, with the judicious use of reflectors on the opposite side of the sitter, but the resulting negative will stand no comparison with one taken in daylight.

The flash light is practically a point, and therefore negatives taken by means of it partake in a greater or less degree of the defects mentioned. Another drawback to the use of the McLellan lamp is this: the exposure and actinism of the light varies in proportion to the amount of oxygen present in the globe. This is a most annoying defect, because you never can be sure of the correct weight of magnesium to use.

To prove this. Set up a picture to copy, and cut off, say, three lengths—each 12 inches—of magnesium ribbon. If the first piece gives a full exposure, the second, being burnt in oxygen diluted with air, will give an underexposed negative; and for the sake of illustration the globe may be washed out and the third length burnt in ordinary air. On developing the three negatives in one dish, at the same time if the first is found to be correctly exposed, the second will be under considerably, and the third will not be half exposed.

From this we learn that magnesium burnt in oxygen emits a much more actinic light than if burnt in ordinary air. Assuming it to be impossible to get a satisfactory negative from a single light, and also taking into consideration that the amount of actinism emitted by a given quantity of magnesium varies according to the amount of oxygen present in immediate contact at the moment of combustion, I thought that if a number of lights could be ignited simultaneously, and the magnesium used in those lights could be burned in pure oxygen, the weak points of the McLellan light would be overcome; and on setting to work in the latter end of the autumn of 1886 I constructed the apparatus to which my friend Mr. Carter refers.

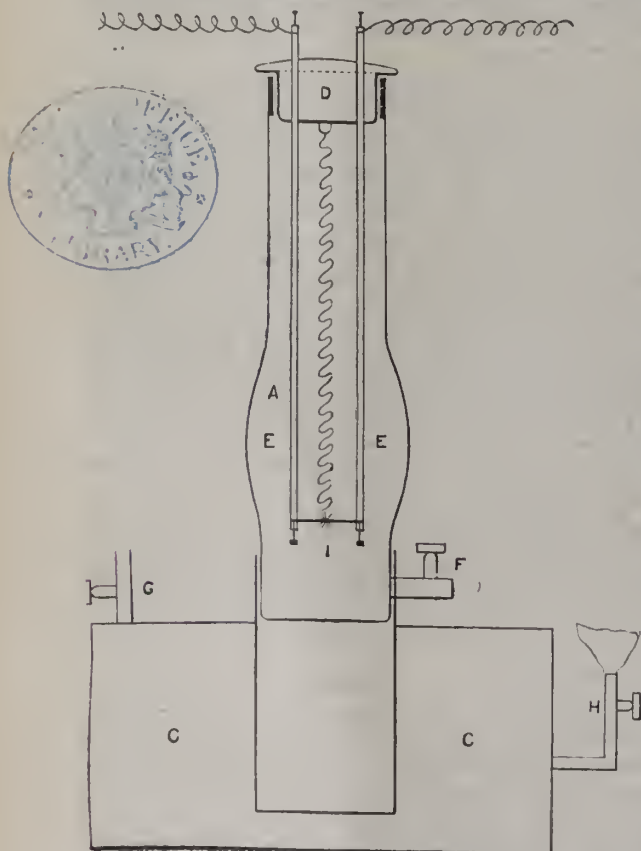
This apparatus was shown more than a year ago to a number of my friends in the photographic way. Also



advertisements appeared in the local papers stating that photos would be taken in private houses, &c., by means of its light.

When present at the Photographic Convention in Glasgow, in July last, I described it to Mr. Carter and some of my friends there. The apparatus consists of a series of lamps, one of which is represented in the subjoined sketch.

The lamp is composed of a glass vessel, A. (The chimney of an ordinary duplex lamp answers well, but where large quantities of pyroxyline are exploded, it is safer to use steam-gauge tubes.) The lower end of this globe is cemented by means of a shellac into a metal tube B, which terminates in the vessel C. C is capable of containing at least three times the cubic contents of A. On the top of the chimney is cemented a metal ring, into which the cork D (carrying the brass or copper rods E E) fits tightly. These rods have binding screws at the top and bottom. From the top wires lead to an induction coil. At the



bottom are placed and fixed, by means of the binding screws, two small pieces of copper wire, with their points in contact at I. The points which meet at I must have been previously tipped with a mixture of equal parts of subphosphide of copper, and the material of which the heads of matches are composed. Soak the heads off a lot, and it will save the trouble of making the compound. When this composition is dry on the copper wires they are ready for use.

The tap F communicates with a bag of oxygen. Tap G (which is of large diameter) allows free ingress, an egress of air, as will be explained further on. H is an ordinary gas jet, which is used for the purpose of focussing.

To use the apparatus. Commence by suspending as many lamps as may be required, connect the gas jets by india-rubber tubes. All the oxygen taps are connected in a similar manner. Turn on the gas and proceed to arrange

the lamps in such positions as will light the sitter to your satisfaction. When this is accomplished, see that all the other stop-cocks are shut. Remove the cork carrying the brass rods, and pour water in the globe till it is filled to the top, and close the top with another cork. Now open the taps G and F. As before mentioned, F is connected with a bag of oxygen under pressure. When G and F are opened the water runs down into C, and the A is filled with oxygen; when full, shut the tap F, and proceed to serve all the other taps in a similar manner.

A small quantity of pyroxyline (upon which the required weight of magnesium powder is sprinkled) is twisted in the form of a rough thread and suspended between the electrodes E E, its lower end being in contact with the copper wires at I. Replace this arrangement in the position represented in the sketch. Do ditto with the remainder of the lamps in the series (magnesium ribbon serves the same purpose, but takes longer to burn).

Everything is now ready for the exposure; all that remains to be done is to connect the electrodes in the form that is used in exploding fuses. On pressing a telegraph key, which is placed in the circuit, ignition of the gun-cotton takes place, commencing at the point I simultaneously in all the lamps, the duration of the flash being less than the tenth part of a second; the water in C immediately rushes up to take the place of the O used in the combustion of the magnesium.

On opening F the O once more bubbles up through the water till the latter recedes, carrying with it nearly all the magnesium oxide into the vessel C, and the apparatus is now ready for preparation of another exposure.

The water serves the double purpose of washing down the MgO and preventing its escape into the air, and of taking the place of the oxygen, which has united with the Mg, thus preventing the dilution of the O with ordinary air. The advantages of an apparatus of this description are apparent; no fumes escape through the studio. If the same quantity of magnesium be used, the negative is always correctly exposed, other things being equal. Pictures equal to those taken in daylight may be obtained by means of it if the operator has sufficient skill to arrange the gas jets before exposure.

Translucent screens should be used between the sitter and the source of light.

#### ON HALATION.

BY J. P. GIBSON.\*

It is useless to attempt to give any definition of halation—halation is a mortal foe to definition.

Any one attempting to photograph a dark interior, lighted only by a plain glass window, in which the window itself forms part of the picture, will, on developing his negative, be painfully aware of the existence of halation in its worst form, if no special means have been taken to prevent its occurrence. Ninety-nine out of every hundred negatives of interiors showing windows of either plain or coloured glass, are rendered imperfect by halation. It is impossible to avoid a certain amount of it, as it is actually seen by the eye when looking at such subjects without the intervention of the camera. Much of this visible halation is no doubt due to particles of dust floating in the air, which reflect and refract the rays of light, and cause them to impinge upon and take away the clear-cut edges of the deep shadows.

By working with paper or film negatives, halation arising from other causes may be avoided; but halation of this sort occurs in paper as well as in glass negatives. This is, however, only one of the minor causes of halation, and had it been the only one we should probably not have been discussing the matter to-night.

In the formation of the undeveloped photographic image in the camera, the rays of light, after passing through the sensitized gelatine film, are reflected from the polished back surface of the glass plate, and return at different angles to the back of the sensitive film, causing in it a mixing up of edges of the high lights and the adjoining deep shadows. This view is supported

\* A communication to the Newcastle and Northern Counties Photographic Association.



by examining an under-exposed negative of such a subject as I have described, when it will be seen, on looking at it as a positive, that the traces of halation are much more distinct on the back—i.e., the glass side—than on the film side.

Halation, although seen in its worst form in interior work, also makes its hateful presence apparent in many landscape negatives, especially those in which light portions of the sky are seen through dark masses of heavy foliage.

The Editor of one of the photographic journals has, during the past few years, lost no opportunity of pointing out the evils of halation in general landscape work, and has done much in suggesting remedies for it.

Often a certain amount of improvement may be effected in a badly halated negative by the judicious use of local reduction. In my own practice I have found the reducer made from red prussiate of potash and hypos to be the safest and best, care being taken not to use it so strong as to stain the film. But the remedies we want must be looked for in prevention, not in cure. These remedies may be divided into two classes.

1st. Those which tend to prevent actinic rays passing through the sensitive film; and

2nd. Those which absorb and render harmless those rays which do get through.

When gelatine plates were all hand-made, and prices were higher, the films were generally richer in silver and more opaque than they are at present, and less light being able to pass through the thicker film, halation was less obtrusively prevalent.

The presence of iodide of silver in the emulsion colours the film a pale yellow, and helps to prevent many of the actinic rays passing through it, therefore we may lay it down as an axiom that for subjects liable to halation the use of thick films containing iodide, as well as bromide of silver, is of vital importance.

Having shown the kind of plate which it is desirable to select, I shall proceed to review some of the different means that are adopted for backing the plate, so as to absorb and prevent the reflections of those actinic rays which still manage to struggle through the film, for as yet no plate has been found which, without backing, is quite free from halation.

To get the best results it is essential that the backing shall be non-actinic in colour, and also that it shall be in optical contact with the glass.

It is also desirable that it shall be easily applied, and easily removed; that there shall be no great amount of superfluous moisture about it, which might cause the plate-holder to swell and stiffen in its action; and also that it shall not be liable to be injured by the spring of the plate-holder, which chafes the plate in the centre, and is apt to remove the backing from the place where it is most needed.

Considering *seriatim* some of the means used to meet these requirements, the first backing I remember using (not counting the black velvet, and moist red blotting paper of wet collodion days) was the burnt sienna coating on the back of the Liverpool dry plates which were sent out commercially nearly twenty years ago. This backing is still much used, but is, I think, wanting in perfect optical contact when dry; it also needs the use of a drying closet, or an artificially heated dark room, as do indeed almost all the methods we have to consider; and as nine out of ten amateurs are unprovided with these appliances, this is a serious objection to its use. I have, however, used a modification of this method which answered fairly well. In it the backing consisted of a sheet of red paper attached to the back of the plate by a coating of thin glue coloured with burnt sienna, and squeegeed into optical contact. This backing also required drying.

At present ready backed plates are sent out commercially which I have found to give excellent results with very little trouble. They are coated with what appears to be a mixture of dextrine and extract of turmeric, and covered with a sheet of dark paper, which prevents the backing being damaged. They are rather costly, and not easily got unless specially ordered from the makers. I can strongly recommend them to any one willing to confine himself to one special make of plate, and also to pay for the extra cost of backing. Carbon tissue soaked in water, and squeegeed on the back of the plate has been used, but is too moist for the plate holders. Fol's backing sheets have many good properties, but are troublesome to make and to apply, and have never come into general use.

Bitumen dissolved in benzole or some other solvent has been much used, and answers well in many respects, but is rather

difficult to remove from the plate after exposure; the particles of bitumen seem to have a strong affinity for the film side of the negative, and when using it I found that I so often got markings caused by its presence on the film side that I gave up its use some years ago.

A mixture of lamp black and japanners' gold size answers well, but, like the bitumen, is rather messy, being apt to dirty the plate holder if not very thoroughly dry. The process recently described in a leading article of one of the photographic journals is, perhaps, the nearest approach to a perfect backing which has been published. In using it the plate is coated with a mixture of lamp black, gum, mucilage, and glycerine. When working this process I take the further precaution of placing a piece of dark-coloured paper over the backing to keep the dark slide clean. To anyone possessed of a drying closet I can recommend this system as being excellent in result, although a little dirty in application.

The process of backing which I purpose demonstrating to-night has not, so far as I am aware, ever been published, nor do I know anyone who has used it but myself. There is a kind of paper to be had of most wholesale stationers which has a smooth black enamel surface on one side. I take a piece of this paper about a quarter of an inch less each way than the plate to be operated upon, smear the enamel side all over with a very few drops of glycerine, using the finger for that purpose; then put it enamel side downwards on the back of the plate, place over it a piece of ordinary letter paper, and rub it down into optical contact with the glass, using the fingers for that purpose, as in rubbing down a print after mounting. If the plate is large a squeegee may be used. After exposure the backing leaves the plate quite easily. The small trace of glycerine adhering to the plate can be wiped off, if desired, before developing the plate. Should the plates not be required for a week or two after their preparation, the addition of one part of gum mucilage to three parts of glycerine is required to ensure continuous adhesion. In backing large plates black American leather cloth with a perfectly smooth surface may be used with advantage, instead of the enamel paper, as it bears more rough usage, and can be used over and over again. With it a fuller dose of gum is necessary. The advantages I claim for this backing are, that it is efficacious, that it is easier to apply, and easier and quicker to remove than any other backing; that it is cheap, that it is not so dirty as other forms of backing, and, finally, that it does not need the use of a drying closet, the plates being put at once into the plate holder, the moisture which is given off by the very slow evaporation of the glycerine doing no harm to the woodwork. Its extreme simplicity and cheapness must recommend it to those who have practised other methods, and I trust that many who have never previously used backing may now be induced to make it a rule, as I do, to use backed plates invariably for landscape work.

## Notes.

The Hon. J. G. P. Vereker, President of the Postal Microscopical Society, in his address published in the *Journal of Microscopy and National Science* for this month, observes, that "the chief results of the last year seem to me to be the development of photography both in itself and in its reference to microscopic work, and also in the interest taken in it by photographers, who, anyway, know what a photograph ought to be like, and who are thus able to give us most valuable help." Mr. Vereker is inclined to think that paper will be the coming thing for microscopists, and suggests an adaptation by which the camera fitted with a roller slide may be used to take the place of the eyepiece. Thus the microscopist could keep it near him while at work, and in a few minutes could shift it for the eyepiece, and take a photograph of any interesting object.

We have often had occasion to refer to photographic enterprise; but what do our readers think of this? That



the London 'Arry, of the better rather than the baser sort, is very fond, when the occasion offers, of putting himself upon a livery stable horse, is a well-known fact. Nay, he likes to pose in the circles he adorns as a man of generally sportive disposition, and amongst the most depressing sights of the period is 'Arry aforesaid arrayed by the efforts of a cheap East-End tailor "for the Meet." It has long been a doubtful point, however, whether 'Arry went to the meet he got himself arrayed for. Some contend that drink rather than "meet" is his special predilection, and that the "coverside" he talks about so loudly at his club—for of course 'Arry has his club—is the bar of a suburban hostelry sufficiently near the scene of a hunt of some sort to suit his purpose. Is there not a circumstantial tradition in existence, indeed, according to which there positively exists in London a certain stable yard, known to the sportive 'Arry and his friends, where the knowing cockney sportsman whose hunting-field experiences are practically *nil*, can have his "tops" and breeches artistically splashed by a trusty retainer, and splashed so thoroughly, moreover, that he is enabled to return to his usual haunts "mud up to his very eyes," as the saying has it? Some have even alleged that several distinct buckets of mixture are kept ready for 'Arry, so that he can be splashed realistically with red mud, or white mud, or brown mud, according to the country over which he may wish to boast of having ridden.

This, though, about the mud is a digression, for what we were about to say was that just as the sportive 'Arry has hitherto been able to swagger about town and boast of his rattling "runs" without so much as going to a meet, so now he may get all the credit amongst his chums—his "dear old pals," he calls them—of being a very Nimrod of the chase without so much as expending five hardly-earned shillings in hiring a livery stable hack. Yes, according to our information, there is a London suburban photographer who, by arrangement with a neighbouring job master, actually numbers a tame and broken-kneed hunter amongst his studio "properties." In other words, he is prepared to "mount" 'Arry as well as his photograph, and to take him, horse and all, for a trifling addition to the ordinary portrait rates. And so well does the enterprising notion answer, that the original idea has been already developed to this extent. The sportive 'Arry now finds at the photographer's the necessary raiment and accessories for dressing for the part he wishes to play; and the way in which brown paper tops and cambric breeches are adapted to the use of sportive sitters—or, rather, riders—is said to be worthy of the most ingenious of property masters. To such a pitch of perfection, indeed, have the studio arrangements been carried, that it is related with pride that last Friday afternoon a would-be Nimrod, who had arranged for an equestrian portrait, made his way to the studio in question, dressed himself in hunting attire, spurs, "property" breeches, top boots, &c., all complete, got—with the aid of a pair of steps—into the saddle of the "stock" hunter, and was taken in three strikingly sportive positions (in one he was seen in the act of giving a "View halloo!"); was lifted down on to

*terra firma* again, undressed, and redressed, and managed to get back to his office stool in Mincing Lane well within the forty-five minutes allowed him for dinner.

Our note of last week regarding the scandalous neglect of the Public Health Department of the City of London has been reprinted with more or less comment in a number of newspapers; the *Daily News* suggesting that not only the photographs of dust heaps should be published, but also the portraits of the responsible officers.

Our paragraph only indicated one of the mildest phases of the neglect by the sanitary department of the City of London, but we happen to know that far worse revelations will be published before long, though not in our columns, sautiation from any point of view other than a photographic one being outside our department. We may, however, mention that Francis O'Connor, of 9, Tower Street, London Fields, has a letter in the *Evening News* of the 17th ult., which should be read by those interested in public health; and who is not interested in this subject?

The first number of the *Evening Star* contains an account of a chat with Mr. Denny, who is about to retire from his position as "Inspector-in-Chief of the Palace of Westminster." We are therein told that the treasure which Inspector Denny prizes above all others, as a memento of his official experience, is a series of superb albums presented him by lobby *habitués*, and filled with portraits of members of Parliament. A glance through these albums carries one back through the parliamentary history of the last twenty years—the most notable portrait being perhaps the portrait, to use the words of the chronicler, of "Dizzy" in a velveteen coat got with some difficulty through Mr. Ralph Disraeli, the great man being averse to giving portraits away. The history of this particular portrait of Disraeli has already been related in these columns. Mr. Inspector Denny ought to put among his collection a certain portrait of the late Capt. Gosset, the first ever published.

How it was obtained was told in the PHOTOGRAPHIC NEWS some three years ago, but the story may be repeated. The artist was at his wits' end how to get at the likeness of Capt. Gosset, who was a prominent figure during the Bradlaugh trouble, and at last, in desperation, he went to the lobby of the House of Commons, and boldly sent in his name, through Inspector Denny, to the popular Sergeant-at-Arms. Out came Capt. Gosset, and then the awful reflection flashed through the artist's mind—What should he say to the dread functionary? Happy thought! He would say nothing and do nothing. Inspector Denny having in the meantime disappeared, he pursued the course of masterly inactivity. Out came Capt. Gosset, looked about for the person who wanted to speak to him, and no one responding he retired disgusted, and no doubt muttering something uncomplimentary. But the artist was satisfied. He had seen Capt. Gosset, which was all that he wanted.



History repeats itself more in connection with photography than with anything with which we are acquainted. and the restless brains of inventors are perpetually re-inventing something. C. E. Pearce writes: "I notice in your last issue that John W. Tinsman, Kirksville, Mo., has patented a method of "exposing as a ground scene grasses, grains, or plants in front of or about the subject being photographed." I congratulate Mr. Tinsman on his courage. Twenty years or so ago I read a paper before the South London Photographic Society on exactly the same subject, which paper was printed in due course in the *News*. I recollect that my suggestions, identical with those of Mr. Tinsman, were ridiculed by the editor of the *Illustrated Photographer*; why, I was not able to understand then, nor do I understand now. I do not mention this to discourage Mr. Tinsman, but merely as a matter of fact. So far as I am concerned, he is quite welcome to his patent, whatever it may be worth. I might also add that in the paper referred to I suggested a method of imitating the effects of water by means of sheets of bright tin laid upon the floor of the studio, the "grasses, grains, or plants," fixed in the manner described by Mr. Tinsman, being placed in the margin, so as to give in the photograph the appearance of a pool. Photographs of "tin water" scenes accompanied the paper, and, if I remember rightly, were leniently criticised by the meeting. Anyway, the remarks, if not enthusiastic, were sufficiently encouraging to permit me now to make a present of the notion to anyone who has sufficient time, money, and faith to patent it."

We have all heard how the victory at Waterloo was said by an illustrious statesman to have been won on the play fields of Eton; and those who, for the sake of the competitive grant, overstrain the pupils of our public elementary schools on the bookish side of training, should profit from a study of six photographs, by Jackson, Bros., of Middleton Junction, near Oldham, showing the pupils of an elementary school at play. The looks of unrestrained happiness go far to indicate that this side of education must be potent in its influence.

When discoursing on photo-mechanical methods at the Camera Club on Wednesday last, H. Trueman Wood made extensive and excellent use of the magic lantern.

Instead of holding up small specimens, which only the front row could have a chance of seeing, Mr. Wood photographed all his specimens in lantern-slide form, and demonstrated all technical peculiarities on the screen. At the same time he told his audience that they must estimate the merits of each production from an inspection of the actual specimens of work which were on the walls of the room.

Specially useful was this method of lecture demonstration in explaining the various methods of producing the grain required for making type blocks.

Altogether the lecture was one of the most successful of the series organized by the Camera Club, and the series of

specimens will remain on the walls for a few days, so as to give all an opportunity of seeing them.

The petition for winding up the Photographic Company promoted by Cellier-Syndicate was down in the list for hearing on Saturday last before Mr. Justice Kay, when the case was settled. The counsel representing the Company stated that the petition had been abandoned. "Ah," said Mr. Justice Kay, "this is a case in reference to which I have had a letter from some one in France. But I know nothing whatever about it." The petition was dismissed.

The aversion on the part of many men to be photographed, to which we alluded last week in connection with the lamented death of Archibald McNeill, has received confirmation in the current number of the *British and Colonial Printer and Register*. In the biographical notice which accompanies a portrait of Mr. Vere Foster, the Editor says that Mr. Foster has a strong dislike to be photographed, and that the portrait given was taken twenty years ago for one of Mr. Foster's emigrants. We are afraid that the early photographers have much to answer for. What with the rush of customers, the slowness of the process, the risk of failure, and the hateful head-rest—the evils of which, by the way, were more fanciful than real—photography has been invested with terrors which now-a-days are purely imaginary.

At the same time, the astute public man who is not in the front rank of popularity will do well not to be photographed. A case in point was brought under our notice this week. An artist engaged to do a cartoon for a certain financial paper, asked us where the photograph of a monetary magnate, the subject of much discourse just now in particular circles, was to be found. We did not know, and as a last resource the artist reproduced, in a rough sketch, a head drawn by Lindsey Swinbourne, in one of his fantastic sketches in *Punch*, of the person in question. But when the sketch was submitted to persons who were well acquainted with the original, the portrait was pronounced to be totally unlike. The artist was in despair, and there seemed to be every prospect of the cartoon being abandoned, when it was decided that a pilgrimage should be made to all the principal photographic dealers as a last resource. The photograph of the city magnate was eventually run to earth in the shop of Mr. King, of Chancery Lane, and it may be, as a consequence of the cartoon, that the magnate will regret that he ever had his photograph taken.

## Patent Intelligence.

### Applications for Letters Patent.

259. WILLIAM FORD STANLEY, "Cumberlow," South Norwood, Surrey, for "Explosives and apparatus connected therewith for producing instantaneous light for photographing."—Jan. 6, 1888.
353. SAMUEL JOSEPH LEVI, of 40, Farnival Street, Holborn, London, E.C., for "Improvements in photographic lamps."—Jan. 9, 1888.



856. **FREDERIC WILLIAM HART**, 8 and 9, Kingsland Green, London, and **WILLIAM BISHOP**, 52, Lady Margaret Road, N.W., London, both in Middlesex, for "Improvements in apparatus for producing flashing lights, for photographic, scenic, and signal purposes, in which magnesium, lyco-odium, and other highly combustible powders are employed singly or in combination for white or coloured flashes."—Jan. 9, 1888.

423. **LOUIS AIME AUGUSTIN LE PRINCE**, 323, High Holborn, Middlesex, for "Improvements in the method of and apparatus for producing animated photographic pictures."—Jan. 10, 1888.

450. **W. DYKE WILKINSON**, **FREDERICK FOWLER**, and **CLIFFORD LEA**, trading as **W. DYKE WILKINSON & Co.**, of 216, Bradford Street, Birmingham, for "An improved glass for photograph frames."—Jan. 11, 1888.

521. **ERNEST HOWARD FARMER**, 24, Southampton Buildings, London, W.C., for "Improvements in photographic printing."—Jan. 12, 1888.

#### Application for Amendment.

In the matter of Letters Patent granted to **ALFRED JULIUS BOULT**, of 323, High Holborn, in the county of Middlesex, for the invention of "Improvements in or relating to holders for photographic films" (a communication).—Dated 25th November, 1884. No. 15,542.

Notice is hereby given, that the above-named **ALFRED JULIUS BOULT** has applied, under the provisions of the Patents, &c., Act, 1883, for leave to amend the Specification of the above mentioned Letters Patent, alleging as his reasons for so doing "that certain of the claiming clauses might be held to cover ground broader than is properly comprised within the grant of these Letters Patent, and that I desire to correct a clerical error."

The amendments proposed are as follows (reference being had to an officially printed copy of the Specification), viz:—

On page 10. Line 46. To substitute "I" for "1."

On page 11. To strike out the claiming clauses numbered 2, 3, 10, and 13, and to re-number the claiming clauses which are retained. Line 25. To substitute "I" for "1."

A copy of the Specification in which the proposed amendments are shown can be inspected at the Patent Office.

Any person or persons intending to oppose the said application must leave particulars of his or their objections to the proposed amendments (in writing in form G), at the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C., within one calendar month from the date hereof.

Dated this 14th day of January, 1888.

H. **READER LACK**, Comptroller-General.

#### Patent on which the Fifth Year's Renewal Fee has been Paid.

101 of 1883. **C. D. ABEL**, (*Attout and another*).—Application of eosine in photography.

#### Specifications Published.

2,662. **LEON WARNERKE**, Silverhowe, Champion Hill, London, S.E., for "Improved photographic film paper."—Dated 21st February, 1887.

Ordinary sized paper of fine texture, prepared with substratum of soluble gummy nature, is covered with gelatine emulsion containing sensitive to light salts of silver. The paper so prepared, after usual exposure to light, in the camera or otherwise, is put in contact with a glass plate under the water, superfluous water being squeezed out. The paper serving only as temporary support, is peeled off, and the film, remaining on the glass, is developed, fixed, and generally treated like the ordinary gelatine plate.

The film produced on the paper is made of such thickness as to enable the developed negative, when peeled off the glass, after drying, to be used for printing without glass.

The substratum above mentioned is prepared by making a mixture, in cold water, of dextrine, starch, caseine, gum arabic, gum tragacanth, blood albumen, or other soluble or semi-soluble, in water gums of the consistency of cream. Relative proportions of ingredients and the choice of gums depend on the quality of the paper and the temperature of the room. This substratum must be applied in uniform layer to the surface of the paper by any of the well known methods.

After drying, the prepared surface must be glazed, which is best done by the frictional caleudar, or by stone-glazing machine. The paper, prepared as above, is next covered with gelatine emulsion, such as generally employed for the preparation of the

plates used in photography. Mode of the application of the emulsion depend on the size of the sheets of the paper. Hand-covering answers for small sheets, while machine is to be used for the covering of endless paper. The emulsion must produce the film possessing necessary thickness, and this is obtained by repeating the coating with emulsion three or four times.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is—

1. Preparation of the gelatine film for the negatives offering all the benefit of the paper, but thanks to the employment of substratum, permitting to transfer the film to the glass plate, before the development, by simple application to the glass in cold water.

2. The advantage gained by developing the film, transparency of which is not marred by the presence of the paper.

3. The advantage of beginning the action of the developer from the surface, not turned to the light, what is especially noticed in the case of over-exposure.

4. The advantage of having a transparent grainless negative film possessing necessary thickness, without any supplementary operation.

2763. **RICHARD EVERETT ATKINSON**, of 257 and 259, State Street, Schenectady in the County of Schenectady and State of New York, United States of America, Photographer, for "Improvements in photographic developing dishes or trays."—Dated 22nd February, 1887.

The Claims are:—

1. The sections or frames of the developing dish or tray hinged together, and provided with the cushions constructed of single pieces of rubber, or similar material, and applied substantially as described.

2. The cushion made of a single piece of rubber or other material, and made narrower and thicker in cross section than the cushion, substantially as described.

3. The sections hinged together by spring or yielding hinges combined with the continuous cushions secured to the adjacent edges of the sections, substantially as described.

4. The section provided with the cushions, and having the pins passed through the cushion into the material of the section, substantially as described.

1533. **WILLIAM JAMES LANCASTER**, of Colmore Row, Birmingham, for "Improvements in photographic cameras and in a focuser to be used therewith."—Dated 1st February, 1887. A long specification with numerous clauses as to detail.

2382. **EDGAR THEODORE PERKEN**, of 14, Canterbury Road, Brixton, for "Improvements in shutters for photographic cameras."—Dated 16th February, 1887. A rise by fall shutter actuated by a spring.

15,722. **HENRY SUTTON**, of Ballarat, in the Colony of Victoria, for "An improved process of converting a photographic image on a gelatine surface into a relief or intaglio printing surface."—Dated 16th November, 1887.

Full text next week.

#### Reviews.

**THE AMERICAN ANNUAL OF PHOTOGRAPHY AND PHOTOGRAPHIC TIMES ALMANAC FOR 1888.** Edited by C. W. Canfield. Large octavo, 330 pages. Price 2s.

We have to congratulate the Editor on having made an immense improvement on the first edition of his annual which appeared a year ago. The excellent features of that book as regards the quality of paper and printing are retained, while the literary matter has been far more carefully selected; although some of it, to say truly, is not quite of the sort to attract English readers.

Very much useful tabular matter has been introduced at the end, and the numerous excellent illustrations are an attractive feature of the work.

All English readers interested in the progress of photography should obtain the American Annual for 1888.



## Correspondence.

## THE OPTICAL CENTRE OF A LENS.

DEAR SIR,—Certainly I did not mean to attack Mr. Chapman Jones individually, and cannot think he will feel offended that I should regard the correctness of his teaching as a matter of some importance. Indeed I am surprised to see the extent to which Ganot's treatise, which seems so much used, is responsible for errors and misconceptions which, I feel convinced, have seriously contributed, by misleading our very teachers, to obscure such knowledge as might help many a worker in choosing and using his lenses. The text books I had in my mind were the more special treatises, and of course need for conciseness must prevent the author of a general treatise on physics from writing fully on any one branch. But Ganot's systematic and determined exclusion of excentrical pencils from consideration, or even recognition, is really extraordinary, because in his fig. 466, the course of an excentrical pencil through a Huyghenian eyepiece is drawn with unusual correctness; though for want of any recognition of excentrical refraction in the text, the peculiar form of excentrical dispersion therein corrected, and its peculiarly injurious nature, is not noticed or explained, but treated as though the dispersion to be corrected were of a similar kind to that of the object glass.

As regards this special doctrine. In the article on optics in the "Edinburgh Encyclopedia," conducted by Sir David Brewster; the lemma (vol. xv. p. 509) says:—"There is within every double convex or double concave lens a certain point called its centre, through which every ray that passes will have its incident and emergent parts parallel; but in plano-convex or plano-concave lenses, this point is removed to the vertex of the convex, or concave surface; and in meniscuses and concavo-convex lenses, it is removed a little way out of them, and lies nearest the surface which has the greatest curvature." Professor Potter I have already quoted. Parkinson's Optics says (Art. 111. Ed. 1884): "If a ray be refracted through a lens in such a manner that its direction between the two refractions passes through C, the centre of the lens, its directions at incidence and emergence will be parallel" (thus excluding every case where the centre is outside the lens). Also he adds: "When a pencil is refracted obliquely through a lens there will be an important difference produced, according as the pencil is refracted centrally or excentrically, *i.e.*, according as the direction of its axis between the two refractions does or does not pass through the centre of the lens." Goodwin (Course of Mathematics, 1853), says (Art. 55): "If, &c.—, and hence, in the case of double-convex or double-concave lenses, which are very thin" (in all these problems the thickness ( $t$ ) is supposed negligible), "we may consider in practice that the centre coincides with the middle point A of the lens, and therefore that a ray passing through A suffers no deviation. But the centre of a concavo-convex or of a meniscus lens may be at a considerable distance from the lens." Surely it is unnecessary to cite further, for even Ganot uses only double-convex or double-concave lenses in his diagrams, and the exceptions which a correct theory requires to be made to his too general statement appear simply to have been carelessly overlooked. Also our common sense shows us that all pencils used in photographic lenses pass through the stop, which is invariably placed (and with excellent reason) on the other side of the lens from this theoretical centre.

I am inclined to think that most of this part of Ganot's treatise is very old, and patched up from time to time. I infer this not only from the archaic character of the only photographic lens described— anterior to Petzval—but also from the ancient terrestrial eye-piece depicted, which was superseded early in this century by one with four lenses. Brewster described both in 1830. His syste-

matic exclusion of excentrical refraction vitiates many explanations, but perhaps the most remarkable example of confusion and error is in Art. 544, on Spherical Aberration. He says: "If a ground glass screen be placed exactly in the focus of a lens the image of an object will be sharply defined in the centre, but indistinct at the edges, and *vice versa*; if the image is sharp at the edges it will be indistinct in the centre. This defect is very objectionable, more especially in lenses used for photography. It is partially obviated by placing before the lens diaphragms; the image thereby becomes sharpened and more distinct, though the illumination is less." Here direct and oblique errors are strangely confounded together, though the text, both preceding and following, clearly shows that direct spherical aberration is alone referred to. Now we know that direct aberration causes indistinctness even in the centre of the image, allowing of no really sharp focus at all. The description clearly points to convexity of field, which is often most strongly perceptible with lenses in which direct aberration is most perfectly corrected. For now that the study of excentrical refraction has enabled us to accurately transmit pencils of much greater obliquity, we know that the conditions which permit of accurate refraction of oblique excentrical pencils, combined with a flat field of view, will not at the same time allow the accurate transmission of large direct pencils. Consequently, our conclusions are almost precisely contrary to those of Ganot, and we know, not only that our stops should be so placed as to cut off the marginal rays only from the central pencils, while oblique ones pass through the opposite margin of the lens; but also that to combine flatness of field with good marginal definition we must use such curves as necessarily allow some direct spherical aberration to remain. On the whole it seems to me that a treatise less suited to the requirements of photographers, as to geometrical optics, could scarcely have been compiled. Very different is the chapter on natural vision, which is as thoroughly good as the other is deficient. Here we are reminded that the Editor of Ganot is also the translator of Helmholtz.

Of course the really important point in all this, which alone could justify the taking up your space with such a controversy, is in no sense a personal one. It is whether photographers can ever be taught intelligently to appreciate the construction and use of their lenses. For to do this we must keep touch with practical facts, which are sure to be in accordance with true theory, and among all the stumbling blocks in the way none seem more hopeless than to be told that a single meniscus lens has a fixed optical centre at some definite distance from its convex surface, and that rays of light passing through that centre are not deflected, while all the time we see and know that the one only place through which every pencil of rays actually passes is the stop, which is on the concave side; also that every pencil is actually deflected, causing distortion unless corrected by another lens. No wonder these things are looked on as inscrutable mysteries. But were an explanation given to suit modern requirements—an "Optics without Mathematics," which need not ignore anything capable of reasonable explanation on account of the complexity of its mathematical treatment—the first important distinction would have to be drawn as to whether the image be formed by centrical pencils, as in telescopes; or by excentrical pencils, as in photographic lenses. Perhaps the next point might be as to "refinements." These, so far from being negligible as in elementary mathematical treatment, are in practice our most vital necessity. All the lenses we actually use are refinements; being more or less corrected, and for different errors in different proportion according to special needs. In the every-day work of choosing and using lenses, we must refine upon refinements in distinguishing and selecting according to our special work. And if generalisations meant for uncorrected instruments are applied to corrected ones, error must result. Optical writers constantly speak



in general terms of the best and worst positions of a plano-convex lens as regards aberration; but our single lenses, being really cemented combinations of convex with correcting concave, may be more or less corrected for either position; and as also the worst position for a direct central pencil may be the best for an oblique excentric one, it may and does follow that we should and do place and use single combinations, both plano-convex and meniscus, in the position rightly called the worst for direct central refraction through an uncorrected lens.

To make the theory of our lenses generally intelligible, I would urge the necessity of bringing such practical considerations as these prominently forward, even in the text books.—I am, dear Sir, yours truly, W. H. WHEELER.

### THE PLATE BOXES OF ARUNDEL AND MARSHALL.

#### EXHIBITION AWARD.

DEAR SIR,—I was particularly glad to see that Arundel and Marshall were awarded a medal at the late Exhibition. I was sorry, but scarcely surprised to see, by notes in the photographic papers, that surprise was expressed at the award of this medal, many failing to see any feature of novelty in the boxes that received it.

I have, on a previous occasion, spoken very highly in favour of the boxes in question, and will, with your permission, say just why I think the medal was well deserved. There is, it is true, no startling novelty in the boxes. On the contrary, they are very similar to others that have been in the market for some considerable time, very similar in external appearance and considerably so in construction. The difference just lies in this: that, on account of details of construction, and presumably in care of manufacture, Arundel and Marshall's boxes are very efficient for the purpose for which they are intended, whereas all other boxes that I know of, that can be had at anything like the same price, are more or less inefficient as compared with them. Now I consider that a maker of apparatus who, in the case of an article of common everyday use, gives us something that is distinctly more efficient than anything that has been obtainable before, is quite as deserving of reward as one who introduces something of startling novelty. To take the most practicable example possible, the use of the boxes in question has certainly proved a greater convenience to me than would the possession of a dozen of the latest improvements in cameras, shutters, &c.

I imagine the criticsers speak without practical knowledge. To them I would commend the following experiment. Take the various cheap plate boxes procurable, fill them with plates in the dark room, let them be used roughly as in travelling; use them over and over again, and see if you do not, by the end of a year, come to the conclusion that the medal was justly awarded. This I have myself done, and therefore speak with some authority.

In conclusion, let me say that I do not know either Arundel or Marshall, am not aware of having ever seen either of them, have held no communication whatever with them, and have not even bought boxes directly from them. I write merely because I believe those who criticised adversely the awarding of the medal spoke without practical knowledge, and therefore criticised unjustly.—I am, sir, yours truly,  
W. K. BURTON.  
*Imperial University, Tokio, Japan.*

### THE OPTICAL LANTERN.

SIR,—I write in support of an art supposed to be on its last legs—the painting of lantern transparencies—not, mark you, the tinting of photos, but hand-painting on glass, pure and simple.

In Mr. W. H. Harrison's historical notes on the optical

lantern he makes some curiously erroneous remarks. He says, quoting Mr. Chatham Pexton, that "the advent of photography gradually destroyed lantern transparency painting as a fine art. This is not quite so. Photography, on the contrary, in entering into rivalry with the artists, has caused them to paint with greater delicacy and detail than ever. The transparencies exhibited at the Polytechnic, though fine in colour and effect, were coarse daubs compared with the best works of the present day. What the old artists represented on a plate 9 inches square, the men of to-day have to do upon 3½ inch plates. Photography has only reduced the remuneration, unfortunately. The writer of this has painted many thousands of figure subjects without the assistance of any photography whatsoever. So also have Mr. Hill, Mr. Doubell, and Mr. Clark, specimens of whose work may be seen at Mr. Steward's, 406, Strand; Messrs. Newton & Co., Fleet Street; Mr. Hughes', Brewster House, Mortimer Road, Kingsland Road, N., and other London opticians. Photos from life, though admirable in their way, have many points where they cannot compete with hand paintings—colour to begin with. No one can prevent the sensitive plate from making the most vivid hues of nature to appear as a sombre black. Neither can anyone put life into human puppets to illustrate stirring action. Some illustrations "from life" are quite laughable. Outlines from good designs are better, but a technical annoyance to the colourist is the film. But no artist can equal a good photo of statuary, admitted.

Mr. Harrison enquires "who was really the inventor of dissolving views." His name was Childe, one of three brothers, scene-painters. He painted many transparencies for the Polytechnic, and had the pleasure, I believe, of showing and explaining them to her Majesty the Queen. He was also the inventor of chromatropes. He died a few years ago at the advanced age of ninety-six. But though he is dead, his art still survives, and Mr. Harrison has no reason to go so far afield as Italy for a "first-class painter." "Honour to whom honour," &c. Only let some one offer a prize competition, say of ten pounds, for the best lantern transparency hand painting, and Britons will come to the front.—Believe me, yours truly,  
FRANK DIXON.

### ORTHOCHROMATIC PHOTOGRAPHY.

SIR,—The letter from Messrs. B. J. Edwards and Co., in your issue of the 13th inst., is mainly a reiteration of their former assertions, to which I have replied in my previous letters. It is unnecessary to go over the same ground again.

Messrs. Edwards and Co. admit that their assertions are in opposition not only to my results, but also to those of the various authorities whom I have quoted from time to time. This is obviously an admission of the chief point at issue, viz., that the great mass of published evidence is in favour of the bath processes. It is a singular fact that the strongest recommendations of bath processes come from a country in which the Taillor process is not protected by a patent, and in which it could be freely worked if it were found to be the best.

May I take this opportunity of especially directing the attention of readers interested in this subject to Waterhouse's article in the "British Journal Almanac" for 1888?

The first part of Messrs. Edwards and Co.'s letter, relating to the theory of optical sensitizers, is entirely beside the points at issue, since in no part of my articles, I repeat, have I expressed my adherence to any theory as to the way in which the dye acts. The experiments were made without reference to any theory whatever, and any value the results may possess is not affected by the truth or falsity of any particular theory. I may remark here that Messrs. Edwards and Co.'s acquaintance with my articles is evidently, from their letters, of an extremely superficial



and inaccurate character. They speak, for instance, in their last letter, of my "spectrum experiments with stained or dyed films of plain gelatine." As a matter of fact, I did not make a single experiment with a film of plain gelatine, and all the spectrum experiments were made with Paget prize plates! It is useless to discuss a question with an opponent who will not take the trouble to ascertain or state correctly what one has really written.

The fact that the silver compound can be separated from the dyed or stained gelatine without losing its orthochromatic properties, does not "appear in print for the first time" in Messrs. Edwards and Co.'s letter of December 16th. It can be found in Eder's papers to which I have so frequently referred, (*Sitzb. d. kais. Akad. d. Wissenschaft. Wien*, 1884, Pt. 2, pp. 1132-1133), and the fact that the colouring matter forms some kind of combination with the silver salt is stated in my articles (pp. 147-148).

The concluding paragraph of my last letter is, I venture to think, sufficiently intelligible, without any further explanation.

With respect to the considerable amount of personal matter which Messrs. Edwards and Co. have seen fit to introduce into their letter, I simply beg to point out that it is only when in one particular predicament that it becomes necessary to abuse the other side.

Messrs. Edwards and Co. confine themselves to making a number of assertions, but do not describe a single experimental proof of any one of them. They admit that their assertions are at variance with the statements of the best known Continental workers on this subject, but they cannot reasonably expect such assertions to be accepted in face of the laborious and extended experimental work of men like Vogel, Eder, and Schumann.

So far as I am concerned, this discussion is now at an end.—I am, yours truly, C. H. BOTHAMLEY.

#### LECTURES BY CHAPMAN JONES.

SIR,—I have just come across a statement in one of my chapters that I inadvertently passed over, and left as a bare idea instead of translating it into proper language. Will you please insert the enclosed errata?—Yours faithfully, CHAPMAN JONES.

13th January, 1888.

#### Errata.

Page 819, 1st column, 18th and 19th lines:—

*Instead of* "The perspective of a picture as produced by any ordinary lens is absolutely correct," &c.

*Read,* "The perspective of a picture as produced by any ordinary non-distorting photographic objective is correct when proper attention is paid to keeping the sensitive plate perpendicular."

Page 819, 1st column, 35th line:—

*After* "centre of the plate,"

*Add* "So far as the possibility of moving it in a horizontal direction is concerned."

### Proceedings of Societies.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The ordinary weekly meeting was held on the 12th inst., C. H. COOK in the chair.

Agreeably with announcement at the previous meeting, F. W. HART exhibited his apparatus for flashing pyrotechnic powder. It consisted of rectangular metal reservoir to hold methylated spirit, with two wicks fitted, one at each end, on which metal cups were screwed when not in use. A receptacle for holding a measured quantity of flashing powder was attached. This being the subject of a patent applied for, particulars were not disclosed. A pneumatic ball and tube attached to this ejected the charge through two spirit flames arranged in a line, causing a brilliant flash. A sheet of asbestos covered the top of the reservoir to protect the spirit from the heat of the flash.

F. A. BRIDGE passed round some negatives that had been taken that afternoon in his studio with the same apparatus as now exhibited—using a rapid rectilinear lens, open aperture. He then took several photographs of a group of the members assembled, the light being flashed by F. W. Hart. 5 grains of magnesium powder were used for each flash. The results were promised to be shown the following week.

W. H. HARRISON said some years ago he had considerable experience with magnesium light, which might be divided into two classes: the instantaneous, as used that evening, and the sand lamp, from which the light was of longer duration and more diffused. A funnel is fixed at the top of an upright iron rod fitted into a stout wooden baseboard; just below the bottom of the funnel a spirit lamp is fixed, having the wick in a horizontal position at one end, immediately underneath the outlet of the funnel. Magnesium powder mixed with sand is used, which, running through the funnel and coming into contact with the flame of the spirit lamp, is ignited, producing one brilliant line of light, the length of which is regulated by the quantity of sand mixed with the magnesium powder. On one occasion he produced a line of light equal to about four feet with this apparatus.

J. W. WHARTON showed a print from a negative taken by flashing gun-cotton.

J. B. B. WELLINGTON was of opinion that gun-cotton and magnesium gave a more diffused light than magnesium powder alone.

J. J. BRIGNSHAW passed round a photograph of a card party taken with the flashing light by G. G. Rockwood, of New York. The interior of the room and figures were well brought out. The photograph had been sent to A. L. Henderson, who forwarded it to the Hon. Secretary for exhibition.

W. H. PRESTWICH handed round a pressure frame for printing out opal pictures. The back of the frame is closely fitted, and is further kept in position to insure accurate register, after inspection of the plate, by a piece of wire projecting horizontally from each side and fitting into recesses in the frame. On the inside of the back three india-rubber "suckers," arranged in a triangular form, hold the opal plate.

J. BRIGNSHAW remarked that a frame on the same principle had been shown at one of the meetings a year or two ago, he believed, by W. Ashman. The frame then shown had one india-rubber sucker to fasten on to the centre of the back of the plate, instead of three, as in the frame then before the meeting.

W. H. PRESTWICH also exhibited a bromide opal that had been exposed 12 inches from a gas jet during a greater part of the meeting; the image was not sufficiently printed out.

J. B. B. WELLINGTON showed a plate, a portion of which had been intensified by Howard Farmer's method, published in the *News of the 23rd ult.*; the other end of the plate had been treated with the same intensifier slightly modified; both parts of the plate were equally good, but it was claimed that the solution was less muddy in use from the modifications adopted.

Herbert C. Wharton was elected a member of the Association.

On Thursday next (which will be a lantern night), the adjourned discussion on W. H. Harrison's paper, "Historical Notes on the Lantern," will take place.

#### CAMERA CLUB.

ON Thursday, January 12th, H. TRUEMAN WOOD, Secretary of the Society of Arts, read a paper on "Photography and the Printing Press." FRANCIS COBB occupied the chair, and there was a very large gathering of members and visitors interested in the subject; altogether one hundred in number. The subject proved a most attractive one. Not only was the lecture illustrated by a series of lantern-slide pictures upon the screen, but Mr. Wood had secured the assistance of the leading illustrated journals and of firms engaged in process work, &c., so that the walls of the club were covered with excellent examples of processes and illustrations of methods of photogravure, &c. These pictures and objects of interest will be on exhibition for some time.

In the course of his lecture, Mr. WOOD described type-block processes, methods of obtaining grain, &c., and treated of the inventions of Pretsch, Dallas, Bruce, Husband, Woodbury, Waterhouse, and Sawyer.

A most exhaustive discussion followed, in which, amongst others, Messrs. Bolas, Traill Taylor, Charles W. Hastings,



Walker (Messrs. Boutall and Walker), Geddes (of Messrs. Waterlow's), Foxlee, Drewett, Leffman, and C. Geard took part.

The subject for Thursday, January 26th, is "A Tour in Spain," lecture, illustrated by lantern pictures, by Andrew Pringle. Meeting at 8 p.m.

*Exhibition of Pictures and Blocks illustrating Photo mechanical Printing Processes and Photogravure.*

The examples lent to illustrate Trueman Wood's lecture on "Photography and the Printing Press" are now on exhibition at the Camera Club, 21, Bedford Street, W.C. Gentlemen of the Press and others interested in the subject are invited to an inspection. Admission on presentation of card. The pictures and examples of processes include works lent by the following firms and gentlemen:—Aunan and Swan, photogravure, &c.; The Autotype Co., autogravure and blocks, &c.; T. Bolas, impressions from Woodbury's first mould, Pletsch method, Dallatype, &c., &c.; Bousod Valadon and Co. (late Gonpil and Co.), photogravure, &c.; E. Bruce, white line etching blocks and prints; D. Dallas, Dallastints, Dallatypes, &c.; J. Dredge, illustrations of Husnik's method; Mr. Foxlee, photogravure; Mr. Griggs, chromo-collotypes and chromo-photolithographs, &c.; Gus. Grainger, illustrations of processes based on Fox Talbot's; *The Graphic*, original drawings and reproductions of same; Chas. Hastings, illustrations of various processes; J. Handcock, photo-engravings, &c.; *The Illustrated London News*, original drawings and reproductions; Captain Maycock, Sergeant-Major Husband's process; C. Lefman, specimens of block printing; The Meisenbach Co., pictures from type printing blocks, &c.; Sprague and Co., ink photo process; J. Traill Taylor, heliogravures, reproduction from Daguerrotype; The Typographic Etching Co. (Messrs. Dawson), photogravure, &c.; Waterlow and Sons, collotypes, &c.; Walker and Boutall.

#### LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.

THE first meeting for the present year was held in the Mayor's Parlour, Old Town Hall, on the 11th inst., W. T. TUCKER in the chair.

Mr. MATTHEWS proposed that the exchange system be inaugurated between the members, as several had intimated to him their desire to have such an arrangement in force, by means of which they might be enabled to dispose of apparatus, &c., for use in photography to other members who might be desirous of possessing the same. This having been carried, the Hon. Secretary was requested to prepare an exchange register to be exhibited in the room on the nights of meeting, so that members might have an opportunity of inspection.

THE TREASURER and HON. SECRETARY presented their report for the past year, showing a balance in hand, after discharging all liabilities, of nearly £9, which was considered highly satisfactory.

It was then resolved that the officers be re-elected *en bloc* for the ensuing session; viz.:—

*President*—Geo. Bankart. *Vice-President*—W. Underwood.

*Treasurer*—W. Sculthorp.

*Hon. Secretary*—H. Pickering, High Cross Street.

*Committee*—Messrs. Toller, Tucker, Sculthorp, and Broadhead.

The meeting then resolved itself into a *conversazione* to assist at a demonstration, by the Hon. Secretary, in portraiture by the magnesium light, performed by sprinkling magnesium powder on pyroxyline, which, with an expenditure of 20 grains magnesium and 15 grains gun-cotton, resulted in a well-exposed negative of the Chairman, Mr. Tucker, which, although rather decided in light and shade, exemplified in a striking manner the practical usefulness of the process.

The Hon. Secretary will be glad to receive names of members willing to assist with papers and demonstrations for the ensuing session.

#### DERBY PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting was held on January 10th, at the rooms, Victoria Street, when there was an exhibition of lantern slides by the members.

On January 11th the annual *conversazione* and exhibition of photographs was held in the Lecture Hall, when, in spite of the dense fog which prevailed, there was a large gathering of members and friends to view the pictures, &c., with which the walls of the hall were well covered, consisting of views of exquisite scenery in Derbyshire, the Lake district, the South of France

and the Pyrenees, and views of quaint streets in France, &c. During the evening an excellent selection of music was performed by the band.

At intervals demonstrations in the platinotype process were given by Richard Keene, and on contact printing on Eastman bromide and Fry's argentotype papers by Thomas Scotton. There was also an interesting lantern exhibition of slides chiefly by the members, conducted by Berwin Cooper.

THE MAYOR of DERBY, who opened the proceedings with an address, was presented by the Secretary, on behalf of the Society, with a copy of the picture which took the first prize in the competition last year.

During the evening a telegram was received from Captain W. de W. Abney, President of the Society, expressing regret at being unable to be present, and his good wishes for the welfare of the Association.

RICHARD KEENE, in the absence of the President, delivered an able and interesting address.

On Friday, January 13th, the annual dinner was held.

#### BIRKENHEAD PHOTOGRAPHIC ASSOCIATION.

THE ordinary meeting was held on January 12, J. H. DAY in the chair.

The minutes of the previous meeting having been read and passed, Mr. DAY proceeded to read his address, which was listened to with interest and attention. After dealing with matters immediately concerning the Association, Mr. Day proceeded to give a sketch, showing much research, of photography from its infancy up to the present. At its conclusion it was unanimously agreed to have the paper published for the use of the members.

B. J. SAYCE exhibited prints from a negative taken by the magnesium flash light on the night of the annual supper of the Liverpool and Birkenhead Associations. Representing, as it did, the interior of a large room with some forty figures at various distances from the camera, it was exceedingly sharp all over, and well illuminated. Four different flashes, of seven grains of magnesium each, had been fired on gun-cotton as simultaneously as possible at different sides of the room, outside the range of the camera, of course; the result being a very even diffusion of the light, and no harsh shadows. Mr. Sayce stated that in order to ensure a complete consumption of the powder used it was necessary it should be thoroughly incorporated with the gun cotton; if merely scattered on the top a considerable quantity would be blown away by the force of the flash and escape being burnt.

Several members gave their experience of the use of the light, dwelling strongly on the necessity of keeping at a respectful distance from the powder at the time of ignition, burnt hands and hair being often the result of incautiously approaching too close.

F. N. EATON gave a demonstration of "Transparency Printing by the Wet Collodion Process," which excited much attention from the younger workers, being to many of them quite a novelty.

The demonstration was followed by a discussion of the respective merits of the wet and dry process for lantern slides, Mr. Eaton maintaining that it was impossible to get perfectly clear glass with gelatine; the verdict, however, was in favour of dry plates, the facility of using them amply compensating for any slight technical excellence possessed by collodion when the trouble of using is taken into consideration.

#### BOLTON PHOTOGRAPHIC SOCIETY.

THE monthly meeting was held at the Baths, Bridgman Street, on Thursday, Jan 12th, 1883, E. N. ASHWORTH in the chair.

After the minutes of last meeting had been read and confirmed, Tom S. Dawson was unanimously elected a member.

THE SECRETARY then exhibited some of Woolff's patent adhesive mounts, and explained the method of using, and distributed sample mounts and price lists. Their advantage to amateurs was favourably commented on.

Several experiments were then made in the magnesium flash light, J. Boothroyd and B. H. Nobult showing the gun-cotton and magnesium process, and T. Parkinson a flash light by the aid of alcohol. He had the magnesium in a wide necked bottle, with two glass tubes through the cork, one tube going to the bottom of the bottle, the other just through the cork; to the shorter tube he had fixed a pneumatic ball, and by squeezing



which he could eject a quantity of the magnesium powder on to a flannel on which a little alcohol had been poured, and ignited. It was the opinion of the meeting that this was the better method; that it was more under control, and the magnesium was more completely consumed.

A new book, entitled "Practical Guide to Photographic and Photo-Mechanical Printing Processes," by W. K. Burton, and published by Marion and Co., London, was shown and favourably commented on.

WALTER STATON brought a quantity of prints on Fry's bromide paper, which were much admired.

The remainder of the evening was taken up by J. BOOTHROYD, who exhibited a new oil lantern, styled the metamorphoser, kindly lent by William Banks; a number of slides were passed through, made by T. Parkinson and J. Boothroyd, as well as a number of professional ones lent by William Banks.

#### BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE usual fortnightly meeting of the above Society was held in the Technical Board School, Bridge Street, on Thursday, the 12th inst., E. H. JAKES (Vice-president) in the chair; 78 members present.

The minutes of the last meeting were read and confirmed.

Mrs. Harts, and J. Cotterill, J. F. Hall Edwards, E. Marlow, E. Marlow, junr., J. A. Richards, E. Fowler, H. W. Southall, C. H. Barnsley, Jas. Allen Smith, and W. Barrows were elected members, and W. H. Blumfield, F. W. Hamps, A. E. Harts, and R. T. Baxter were nominated for election.

THE HON. SECRETARY read a letter from Marion and Co., presenting Burton's new book on printing processes, and the thanks of the Society were voted to Marion and Co. for the same.

Carbon pictures on opal were shown by W. Curtis.

Question Box contained—"What is the best solution to use in mounting pictures on glass, beyond putting in metal rims?"

A. PUMPHREY: 20 grains of gelatine and 1 ounce of water.

E. H. JAKES: 20 grains of gelatine, 5 minims of glycerine, and one ounce of water.

The remainder of the evening was devoted to a display of lantern slides by the lantern committee—a very large number having been sent in by the members for exhibition, the greater part of which showed a very considerable advance in quality on the last exhibition. Amongst them was a very interesting collection of slides from negatives taken underground by means of magnesium torches at a colliery in the neighbouring districts.

#### SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of the Sheffield Photographic Society took place on Tuesday, January 10th, in the Masouic Hall, Surrey Street; A. S. PLATTS, Vice-President, occupied the chair, and there was a good attendance of members.

After the confirmation of minutes, H. Pawson was elected a member.

T. G. Hibbert having kindly volunteered to lend the Society over a hundred lantern slides taken by Colonel Hooper in Burma, it was resolved that a semi-public exhibition of them should be held at an early date, the details to be left to the Council.

The Hon. Secretary, J. T. CHARLESWORTH, next read a paper on "Lantern Slide Making," and this was followed by practical demonstrations, Mr. Charlesworth developing a Mawson plate with the meta-bisulphite developer; Mr. Hibbert, two Mawson's plates with Berkeley's sulphite developer; Mr. Furniss, two Mawson's plates with ferrous oxalate; and Mr. Platts, two Fry's plates with ferrous oxalate. The demonstrations were on the whole successful, the pyro developers being about as clean as the iron developers.

A vote of thanks to Mr. Charlesworth for his paper concluded the business.

#### SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

THE regular monthly lantern exhibition was held on Wednesday evening, December 28, 1887, at the rooms of the Society, 123, West 36th Street, and comprised one hundred lantern slides contributed to the interchange of societies by the Boston Camera Club, in addition to a few others made by members of the Society.

The Boston slides represented the work of ten or twelve

members, and proved to be much more creditable to the club than last year's work. Several new names were mentioned.

C. Eaton's views opened the exhibition; they showed excellent skill.

W. G. Read had some pretty views taken in the White Mountains, near the Ridge House.

T. Philbrick showed fine surf effects and a beautiful view of Narragansett Pier. One of a wreck near Newport was excellent. The interior of a church and exterior of Harvard Law School, by J. P. Loud, were highly commendable.

A road in Newport, by W. O. Lewis, was also well received.

J. Preston had a series of excellent instantaneous views; one, of the "Nibbles' Lighthouse," was beautifully clear and sharp. His surf views around Newport were greatly admired.

One slide, contributed by C. W. Lattimer, made from his paper negative of a view looking across the Merced River in the Yosemite Valley, was particularly clear and free from grain.

By some others were excellent snow scenes, views of log huts in the snow, showing the delicate shadows of the bushes playing on the same.

Also fine pictures of New England elms along a roadside, and views of old apple trees with their quaint irregular shaped branches in an orchard.

Following the Boston slides, several by H. J. Newton, on collodio-chloride plates, were shown, which had a peculiar red colour, but were at the same time extremely clear.

A novel phantom picture made by Mrs. Thorn, Jr., showed the peculiar effects that may be accidentally obtained by making two exposures on the same plate. There were also a few good experimental slides shown by L. P. Atkinson.

The exhibition closed with an excellent view of the rocks at Mount Dessett, by Edward Gallagher, one of the youngest members of the Society.

The lantern was operated by Messrs. Lawrence, Frisbie, and Eckert, and the titles were read off by Secretary Granger.

#### NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

THE annual meeting was held at the Mosley Street Café, Newcastle-on-Tyne, on the 10th inst., J. P. GIBSON, Vice-President, in the chair.

After the ordinary business the CHAIRMAN called upon the Hon. Secretary to read the seventh annual report, from which the following is extracted:—

"The chief event of the year has been the highly successful exhibition of photographs in connexion with the Royal Jubilee Exhibition. The exhibits in this section were very much appreciated, and formed altogether a very interesting feature of the Newcastle Exhibition. It is to be regretted that more and better space could not be given us. A lantern slide competition, confined to members, was held in March; two medals were offered, and judges appointed to make the award; the exhibition of the slides took place in public at the Literary and Philosophical Institute. Papers and demonstrations were given by Mr. John Jackson on 'Eastman Stripping Films,' and Mr. J. Pike on 'Photo-micrography,' though various other subjects (notably 'Orthochromatic Photography') have been discussed. Eight new members have been elected during 1887; on the other side we have lost several by removal and resignation. The Association loses this year (as an active member) in the person of its late President, Professor Herschel, who has left Newcastle, its most influential and hardworking member. It will be necessary for members generally to come forward with much more energy than hitherto to help on the work of the Association, and in furtherance of this object the Secretary will be glad to receive communications from gentlemen able and willing to contribute papers."

The Hon. Treasurer (P. M. LAWS) then read the financial statement for the year ending 1887, showing a small balance in hand.

The following is the list of officers elected for the current year!—

President—A. S. Stevenson, J.P.

Vice-Presidents—J. P. Gibson and H. R. Proctor.

Council—M. Auty, T. Galloway, H. C. Hemy, J. F. Maling, J. Pike, W. Parry, J. W. Robson, E. Schumann, H. Shand, and L. Williamson.

Hon. Treasurer—P. M. Laws.

Hon. Secretary—Edgar G. Lee, 3, Woodbine Road, Gosforth Newcastle-on-Tyne.



It was determined that the ordinary monthly meeting shall be held on the second Tuesday in each month during the year, excepting May, June, July, August, and September. For the present the monthly meetings will be held in the Mosley Street Café, Newcastle-on-Tyne.

A discussion upon "Halation" then followed, the CHAIRMAN reading an interesting paper upon the subject (see page 38).

A short paper followed, by H. R. PROCTOR, Mr. Lang, of Glasgow, and Mr. Macleod, of Aberdeen, contributing their experience. P. M. Laws, J. Pike, H. C. Hemy, and others, also took part.

Mr. LANG then addressed the meeting about the coming Glasgow Exhibition, and said that photography should be included amongst the fine arts.

"The Development of Gelatine Dry Plates, especially Instantaneous Work," was the subject chosen for the next meeting.

A. S. STEVENSON, the newly-elected President, moved a vote of thanks to Professor Herschell, his predecessor in office, in a very happy and complimentary speech. He then alluded to his connexion with the old Photographic Society, formed in 1854, and of which Mr. Swan and Mr. Newall were also members.

A relic of those days, a calotype portrait of 1853, was shown by the President. Although the result of an exposure of fifteen minutes, it was tolerably sharp, and, artistically speaking, was of far greater merit than the majority of modern photographs.

## Talk in the Studio.

THE DUBLIN EXHIBITION.—W. W. Winter writes:—"In your report of the Dublin Exhibition of the 6th inst., you have made a slight error as to the awards, and in justice to myself, I beg to state that the silver medal was awarded to my picture 'The Rhymster and his Victim,' and the bronze to Mr. Sutcliffe, for 'Water Rats.'"

"GRIGGS' JOURNAL OF INDIAN ART."—We have received for review a complete set of the *Journal of Indian Art*, photographed and printed by Mr. Griggs, of Elm House, Peckham, and issued by Bernard Quaritch, of Piccadilly. There are before us twenty-one numbers, dating from January, 1884, to January, 1888, and the series form a magnificent monument to the energy, skill, and resource of Mr. Griggs. Considering what is given, the price is surprisingly low, 2s. per number. We shall say more about the matter next week.

"THE HAYFIELD." PHOTOGRAPHED BY EMERSON, AND PHOTO-ENGRAVED BY DAWSON.—The plate has been sent us, and we shall review it next week; in the meantime we may say it is a credit to photographer and photo-engraver.

THE LIVERPOOL PHOTOGRAPHIC EXHIBITION.—The Hon. Secretary, Thomas L. Mayne, of Fenwick Court, Liverpool, informs us that the time for sending in applications for space has been extended to the 31st of this month. He also informs us that everything bids fair for a first class exhibition, but the committee desire to make it as completely representative as possible.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The usual Monthly Technical Meeting of this Society will take place next Tuesday, January 24th, at 8 p.m., at the Gallery, 5A, Pall Mall East. Open at 7 p.m. for conversation and journals.

MASTIC AND BISMUTH CEMENT.—Dissolve gum mastic in chloroform, and thicken with nitrate of bismuth. The solution of mastic should be nearly saturated.

PHOTO-ELECTRIC CURRENTS.—By J. MOSER.—The author finds that the electro motive force produced by the action of sunlight on chloride, iodide, or bromide of silver plates can be considerably increased by immersing them in a bath of a dye, say, erythrosin. — *Journal of the Chemical Society*.

DR. VOGEL ON THE FLASH LIGHT.—Dr. Vogel, writing in *Anthony's Bulletin*, says:—"I have observed that many people fall into mistakes in the application of the magnesium flash light, particularly with regard to the position of the screen of tissue paper. They generally have it too large and place it too close to the lamp, shading the reflector near the sitter. In consequence of this the shady part of the person will remain too dark. The tissue paper is only to prevent the rays from falling direct on the face, and for this a piece one foot square is fully sufficient. The background is also generally too dark. I use a white one ;

and, being double the distance from the lights than the sitter, it is four times as dark, and, therefore, the correct density. A white overhead screen, being spread about four feet above the person, has a very good effect, it giving more light to the hair. These are small matters, but a good deal depends upon them. The process has a great future."

PHOTOGRAPHIC CLUB.—The subject for discussion on January 25th will be "Lantern Matters." This is a lantern night, to which visitors are invited.

## To Correspondents.

•• Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C. 1;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C. 1."

JACKSON BROS.—We are much obliged to you for the photographs, which are not only excellent as photographs, but also show good judgment as regards the positions selected. We shall send them to a friend who is interested in the work of public elementary education. Send a set to the Editor of the *Graphic*.

CONSTANT READER.—Oleic acid—a fluid fatty acid—is generally sold under this name.

GEO. W. PHILLIPS.—1. We have never seen it, and we have doubts whether it really exists. 2. Write to Hopkin and Williams, Operative Chemists, Cross Street, Hatton Garden. 3. Only just possible, so much light being required; with a powerful electric light, however, it becomes less difficult, but hardly a convenient method of working.

C. J. ADKINS.—1. Not quite so long or so soft; the best we have seen comes from Cyprus. Write to one of the asbestos companies for samples of their best qualities.

R. KEENE.—Thanks. Paper received, and will appear in our next.

JOHN R. WILSON.—His formula is incorrect. All beyond a distance for the lens equal to one hundred times its equivalent focus will be sufficiently well in focus with an aperture of  $\frac{1}{11}$ .

LOMA.—The first in the YEAR-BOOK list. 2. We prefer the former. 3. One of the salt to six of water. 4. Again we must refer you to the YEAR-BOOK; the first on the list being that which we consider best for all-round work. 5. To each ounce of the solution add one grain of citric acid. 6. We cannot tell you. 7. We have not tried them.

G. and W. MORGAN.—Use benzole—that is to say, the real article from coal tar—and if it operates too rapidly, lower its action by adding turpentine.

Q. G.—It is a brush made up with long and loose badger-hairs, and can be obtained from any dealer in artists' goods.

OXONIAN.—For general work, we should say that No. 1 is by far the best, although, in some cases, a wider angle is required, and No. 2 may be desirable.

A. W. W.—Dissolve gum dammar in benzole, about sixty grains to an ounce being a suitable proportion for general work.

T. W. H.—1. We believe the proportions thus given work well, and that no additional acid is required. 2. Yes; grains. 3. Only partially, and, after filtration, the solution will be in working order.

W. N.—1.—The platinotype paper referred to is, as far as we know, not in the market, and you will have to prepare it yourself. 2. The matter is one referring to the business of the publishers, and we have handed over your letter to them.

## The Photographic News.

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For Advertisement Scale see page v.

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# THE PHOTOGRAPHIC NEWS.



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### HUSBAND'S PROCESS OF PHOTO-LITHOGRAPHY IN HALF-TONE.

This method, published in detail about nine months ago, has recently gained some attention, and at the recent lectures of H. Trueman Wood at the Camera Club, much interest was expressed in subject. Hence no apology is needed for now once more referring to the matter in some detail.

The method in question, which Husband calls papyrotint, may be regarded as such a modification of Abney's papyrotype (see his "Instruction in Photography" Seventh Edition, page 313) as shall lead to the production of a grained image from a negative after nature—a grained transfer, in fact—which shall be sufficiently definite to be transferred to stone, and to print in the lithographic press.

The main factor is the production of the grains in common salt added to the gelatinous mixture with which the paper is coated in the first instance; while the same salt, and also ferricyanide of potassium, are added to the sensitizing bath.

The details of the method as given in the Journal of the Photographic Society are as follows:—

Any good surfaced paper is floated on a bath composed of:—

Gelatine (Nelson's flake) .....	8 ounces
Glycerine .....	1½ ounce
Chloride of sodium (common salt) .....	2 ounces
Water .....	50 "

Great care should be taken that the solution is not overheated, and that the paper is coated without bubbles. It is then dried in a temperature of 60° Fahr. The paper will take about ten hours to dry, and in this state will keep for years. When required for use it should be sensitised by floating, or immersing, in a bath of:—

Bichromate of potash.....	1 ounce
Chloride of sodium .....	½ "
Ferricyanide of potassium .....	100 grains
Water .....	30 ounces

This need not be done in the dark room, as the solution is not sensitive to light.

The paper, after sensitising, is dried in a temperature of 70°, and in a dark room. When dry, it is exposed under any half-tone negative, in the ordinary printing frame. It is preferable to print in sunlight, and, for negatives of medium density, an exposure of three minutes is required; but the exposure will vary according to the density of the negative. The correct time of exposure can best be judged by looking at the print in the frame. When the image appears on the transfer paper of a dark fawn colour on a yellow ground, the transfer is sufficiently printed. It is put into a bath of cold water about ten minutes, until the soluble gelatine has taken up its full quantity of water; then taken out, placed on a flat piece of stone, glass, or zinc-plate, and the surface dried with blotting paper.

The action of the light has been to render the parts to which it has penetrated through the negative partly insoluble, and, at the same time, granulated. A hard transfer ink is now used, composed of—

White virgin wax ... ..	½ ounce
Stearine ... ..	½ "
Common resin ... ..	½ "

These are melted together in a crucible over a small gas jet, and to them are added, four ounces of chalk printing ink, and the mixture reduced to the consistency of cream with spirits of turpentine. A soft sponge is saturated with this mixture, and rubbed gently over the exposed paper (in this stage the nature of the grain can be best seen). An ordinary letter-press roller, charged with a little ink from the inking-slab, is then passed over the transfer, causing the ink to adhere firmly to the parts affected by the light, and removing it from the parts unacted upon. It will be found that with practice, rolling slowly and carefully as a letter-press printer would his forme, the ink will be removed by the roller according to the action that has taken place by light, leaving the shadows fully charged with ink, and the high lights almost clear, the result being a grained transfer in greasy ink. The transfer is next put into a weak bath of tannin and bichromate of potash for a few minutes, and when taken out the surplus solution should be carefully dried off between clean sheets of blotting-paper. The transfer is hung up to dry, and, when thoroughly dry, the whole of the still sensitive surface should be exposed to light for about two minutes. A weak solution of oxalic acid should be used for damping the transfer (about 1 in 100), and this should be applied to the back of the transfer with a soft sponge. After it has been damped about four times, it should be carefully put between clean sheets of blotting-paper, and the surplus moisture removed. A cold polished stone is then set in the press, and, after everything is ready, the transfer is placed on the stone and pulled through twice. The stone or scraper is then reversed, and the transfer is again twice pulled through. A moderate pressure and a hard backing sheet should be used, care being taken not to increase the pressure after the first pull through. The transfer is taken from the stone without damping, when it will be found that the ink has left the paper clean. Gum up the stone in the usual way, but, if possible, let the transfer remain a few hours before rolling up. Do not wash it out with turpentine, and use middle varnish to thin down the ink.

It should have been mentioned that varying degrees of fineness of grain can be given to the transfer by adding a little more ferricyanide of potassium in the sensitizing solution, and drying the transfer paper at a higher temperature, or by heating the paper a little before exposure, or by adding a little hot water to the cold water bath, after the transfer has been fully exposed; the higher the temperature of the water the coarser the grain will be. The finer grain is best suited to negatives from Nature when a considerable amount of detail has to be shown.

The coarse grain is best for subjects in monochrome, or large negatives from Nature, of architecture, &c., where the detail is not so small. Even from the finer grain several hundred copies can be pulled, as many as 1,200 having been pulled from a single transfer.



## THE CONFERENCE OF THE CAMERA CLUB.

THE Conference for 1888 will be held in the Theatre of the Society of Arts, on Tuesday and Wednesday, March 13th and 14th, under the presidency of Captain W. de W. Abney, R.E., F.R.S.

The following is the programme as at present arranged:—

Monday, March 12th, 8 p.m.—Smoking Concert at the Camera Club rooms, 21, Bedford Street, Covent Garden.

Tuesday, March 13th, 2 p.m.—Conference and Exhibition of Apparatus, at the Society of Arts, to be opened by the President. Papers read from 2 p.m. to 5.30 p.m., in the theatre. The Exhibition of Apparatus will be in the large library of the Society of Arts. At 8 p.m.—Exhibition of Selected Lantern Slides in the theatre.

Wednesday, March 14th, 10 a.m.—Apparatus on view at the Society of Arts. Exhibition of Photographs by members at the Club rooms, 21, Bedford Street. 2 p.m.—Renewal of Conference in the theatre, Society of Arts, papers read from 2 to 5.30 p.m. 7.30 p.m.—Annual Club dinner for members and friends at the Holborn Restaurant.

The general committee for carrying out the necessary arrangements is constituted as follows:—

Conference Committee:—Capt. W. de W. Abney, T. Bolas, F. Cobb, Lyonel Clark, P. H. Emerson, J. Gale, W. Asbury Greene, Charles W. Hastings, R. B. Martin, Andrew Pringle, Sir George R. Prescott, Bart., F. Machell Smith, J. Harris Stone, Sir David Salomons, Bart., H. Treuman Wood, J. Traill Taylor, the Hon. Secretaries, J. C. Huxly, M.D. (Birmingham Photo. Soc.), R. M. Meyer (Cambridge University Photo. Soc.), J. B. Sayce (Liverpool Amateur Photo. Association).

A full programme of the papers and final arrangements will be issued later on, and distributed; and tickets for the Conference and Exhibitions will be given to all photographers who apply to the Hon. Secs. at the Club house, 21, Bedford Street, Covent Garden, London.

## WILFULLY DESTROYING BROMIDE PAPER BY EXPOSURE TO LIGHT.

A REMARKABLE case came on for hearing at the Sheriff's Court, Bute, on Tuesday, the 17th inst., an assistant, who was about to leave his employment, having, it was alleged, exposed to light a quantity of bromide paper then in his employer's stock, with the view to "bamboozle the next fellow that came to the place."

The following account is from the *Buteman and Advertiser for the Western Isles*, of Saturday last:—

At the Sheriff Court on Tuesday, before Sheriff Orr, Charles Sweet, photographer, was charged with having, while in the employment of Messrs. Adamson and Sons, photographers, Rothesay, exposed certain sheets of bromide paper to the light, whereby they were rendered useless.

Mr. George Thomson, writer, defended and took several objections to the relevancy of the libel. His first objection was that the Fiscal had taken too great a latitude in stating the offence had been committed between 1st November and 1st March, being five months; the second objection was that the case was too long in being brought into court, being nearly fifteen months from the first date libelled; and the third, that the number of sheets destroyed was not stated in the libel. The Sheriff repelled the first two objections, but sustained the third, and the number was inserted, the Fiscal restricting it to 30 sheets.

Mr. Sweet pleaded not guilty, and a number of witnesses were examined.

Mr. John Adamson, Jun., partner in the firm of Adamson and Sons, photographers, Chapelhill Road, deposed that bromide paper was used in their business for the purpose of enlarging photographs. If exposed either to gaslight or daylight it would be rendered useless. If exposed to a ruby light, it would do no harm. Mr. Sweet was in their employment for about three years, and left in March last. After he left, he had complaints from the new assistant that the bromide paper was "fogged" (spoiled by exposure), and he ordered new paper altogether,

putting the "fogged" paper on one side. He did not know who had destroyed that paper. If the ends of the boxes were cut off, and daylight or gaslight admitted, it would fog the paper. It was kept in boxes on a shelf in the dark room. It was quite possible that bad paper might have been there on Nov. 1st, 1886 (the date libelled), but his instructions were that defective paper should always be returned at once. During the time Mr. Sweet was there he had complained about four or five times as to bad paper. Two copies of photographs being here produced, one done on fogged paper, and one on good paper, Mr. Adamson stated he would say the fogged one had been exposed to the gaslight. If exposed to daylight no picture would come out at all.

Cross-examined by Mr. Thomson—The paper was kept in the dark room alongside the gas. He should say the specimen produced was not older than 18 months or two years. It was possible that when Mr. Sweet left, there was paper in the place that had been there for three years. They got the paper from several different makers. Mr. M'Kim sometimes worked at the paper as well as Mr. Sweet. The boys Dugald Campbell and Robert Whiteford were also about the room. A quantity of useless paper was lying there for a long time. Mr. Sweet was told to return it two or three years ago, as it was useless.

By the Sheriff—Might that not be the paper alleged to have been destroyed?

Witness—Not by the way it has developed. The assistant had found 9½ sheets "fogged." He could not tell how long that paper had been in the place.

Robert Whiteford, 15 years of age, employed by Messrs. Adamson as an assistant printer, said he had been 18 months in the employment. One evening he saw Mr. Sweet in the dark room expose the bromide paper to the gaslight. The date would be between November and January. He took about 8 sheets and held them up to the gas, and then rolled them up again. He also saw Mr. Sweet, on the same night, put his knife in at the end of the bromide boxes and cut the edges. He (witness) was aware that this would destroy the paper, but he said nothing to his master, as he was afraid of Mr. Sweet. It was the middle of last summer before it was discovered that the paper was "fogged." Mr. Lundie, the new assistant, spoke to witness about it, and he then told him what had happened.

Cross-examined by Mr. Thomson—It would be between three and six o'clock in the evening when this occurred. Mr. Kinloch was not present, but Dugald Campbell was. Witness saw Mr. Sweet roll the paper up again, but didn't see where he put it. Mr. Sweet made no remark when he did it. The paper was there when he entered the employment. The gas was not in the ruby globe, but was the ordinary white light. He had not been forbidden to be in the dark room along with Dugald Campbell. It was not the case that he had been crying, and asking why he was to be called as a witness when he knew nothing about the case.

Dugald Campbell, apprentice with Messrs. Adamson, remembered being in the dark room on the occasion spoken of by Robert Whiteford. It would be about the New Year time. He (witness) was standing beside Mr. Sweet when he exposed the paper, roll after roll, to the gas. Mr. Sweet made the remark, "that this would bamboozle the next fellow that came to the place." Witness was not aware that Mr. Sweet was leaving. He knew that the exposure would destroy the paper, but did not inform his employers, as he was afraid it would be "cast up" to him by Mr. Sweet. He never saw him cut the ends of the boxes. There were only the three of them there. He saw him put the sheets back again in the same box. Mr. Lundie charged him with spoiling the paper, and he told him the truth. That would be about three months after Mr. Lundie came.

Cross-examined by Mr. Geo. Thomson—It was not the ruby globe, but the white gas. It would be about four or five in the afternoon. Mr. Kinloch was not in the room at the time. Whiteford was in the room, but behind the curtain in the centre. It was possible Mr. Kinloch was there, but he did not see him. Whiteford was present when the remark was made that this would bamboozle the next fellow that came.

Murray Lundie, assistant with Messrs. Adamson, said he entered the employment in March, 1887. He had no occasion to use the bromide paper till about three months after he came, when he found it was "fogged" and useless. Two of the round boxes had the ends cut off.

Cross-examined by Mr. Thomson—Damp may destroy this paper also, but in a different way. He challenged the boys with it, and they said it was Mr. Sweet. Being busy in



the summer, he did not tell Mr. Adamson till he had time to try some more of the sheets.

James Weir, another assistant with Messrs. Adamson, said that Mr. Lundie drew his attention to the "fogged" paper about the end of June. He went into the dark-room and saw it. It appeared to have been exposed to the light.

Charles Kinloch, for the defence, said he was a photographer. He had been seven years with Messrs. Adamson, and left in April last. There were different makes of bromide paper used, and some got from Morgan and Kidd were put aside, being bad, and Eastman's used instead. He remembered, in the month of December, Mr. Sweet asking him to go into the dark-room. He went there, and Mr. Sweet transferred the bromide paper from one box to another. This was the bad paper, and he (Sweet) made the remark that anyone trying to enlarge with it would find it difficult. It was the ruby light that was burning. Dugald Campbell was there at the time. Some of the boxes in which the paper was kept were broken at the edges by falling off the shelf, and witness tied the ends with brown paper.

Cross-examined by the Fiscal—He thought there was fogged paper in the place three years ago when Mr. Sweet came. It was true he had stated before that it was not fogged, only spotted. Mr. Sweet made two enlargements with Eastman's paper the day he left. He had been using it solely for months, Morgan and Kidd's being thrown aside as useless.

Mr. Thomson, for defendant, said that this case was the outcome of a misapprehension from beginning to end. Mr. Sweet before leaving destroyed a quantity of defective paper that had been there for a long time. The story of the two boys was a most unlikely one, and the particulars were of a very flimsy nature. The action would never have been heard of but for the fact that Mr. Sweet was now a rival in business, and it was the outcome of professional jealousy.

The Sheriff said that unless it was to be supposed that the two boys deliberately perjured themselves, and kept on doing so since June last, he must accept their evidence. The occasion spoken of by Mr. Kinloch must have been a different one. The offence was not of a very serious nature, but it was nasty, trying to harm a neighbour, while doing no good to himself, and therefore could only be called malicious mischief. As there was only evidence of eight or nine sheets having been destroyed, he thought a fine of one guinea or ten days would be sufficient to meet the case. The fine was paid. The case lasted for two hours and a quarter, and seemed to excite a great deal of interest, the court being crowded.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

**DEATH OF MAX PETSCH**—THE HYDROXYLAMINE DEVELOPER—NEW DEVELOPERS FOR GELATINO-BROMIDE PAPER.

*Death of Max Petsch.*—Photography has lost another of its ablest workers in the death of Max Petsch, late of the well-known firm Loescher and Petsch, of Berlin. He died on the 13th of December, at Carlsruhe, at the age of forty-seven. Petsch was born at Berlin, where he was since 1862 associated with his friend Loescher, and where he lived until 1874, when he resolved to give up photography, and to entirely devote himself to the art of painting. He followed his teacher, the distinguished colourist Gnssow, of Weimar, to Carlsruhe, intending to perfect himself in portrait painting. He was, however, by far more successful in another branch of the art, namely, in the painting of flowers, which he practised with perfect superiority. As a photographer Petsch was always exceedingly active and a perfect artist, his excellent treatises on pictorial photography and photographic æsthetics, which he published in the *Mittheilungen*, giving evidence of his restless public activity. He was one of the founders of the Berlin "Verein zur Förderung der Photographie," by which Society he was in 1874 designed honorary member.

*The Hydroxylamine Developer in Germany.*—The development with hydroxylamine has lately occupied much attention in Germany, and some of our most skilful workers have made experiments in order to try the merits and the

practical value of this developer. A *resumé* of the results obtained will, perhaps, be of some interest to your readers. Perutz and Friedr. Müller, of Mnich, in using the formula originally recommended by Egli and Spiller, obtained no satisfactory results. The picture appeared very fine, but by puckering of the film the negative was entirely spoiled. The use of carbonate of soda instead of caustic soda remained without any effect. The experiments were made by H. Koch, of Nenwied, who showed that the hydroxylamine, not the caustic soda, always causes the puckering of the film. The quantity of the hydroxylamine should therefore be reduced as much as possible. The following proportion answers well:—

Hydroxylamine solution (1 : 15 alcohol) ...	3.5 c.c.
Caustic soda solution (1 : 8) ...	6 c.c.
Water ...	40 to 50 c.c.
Bromide of potassium solution (1 : 10) ...	1 to 2 drops, as required.

If the negatives prove to be too weak they may be intensified with bichloride of mercury and ammonia. Further experiments were made by Captain Himly, of Berlin, who found it very useful to add some white sugar and a small portion of syrup to the developer, in order to reduce the action of the caustic soda solution. He recommends the following mixture:—

A.—Caustic soda ...	1 to 8 parts of water
White sugar ...	8 parts, and syrup 4 parts
B.—Hydroxylamine ...	20 "
Distilled water ...	50 "
Alcohol ...	250 "

For use 2 parts of A are mixed with 1 part of B, and water is added in the proportion of 1 to 5. As with this developer only very thin negatives are obtainable, it is a good plan to add 25 to 30 drops of a hydrokinone solution (1 to 10 alcohol) to each development, which forms a most effective remedy to this defect. After a period of about one minute the image will begin to appear, and after five to six minutes the development will be complete. The negative is then at once placed in an alum solution, where it remains until the film no longer pushes off the liquid like oil; then it is well rinsed, fixed, and washed in the usual manner. All these experimentalists, though the results they obtained may be somewhat different, agree for the fact that hydroxylamine forms a splendid developing agent, which produces very fine bluish black tones; but in the case of gelatino-bromide plates certain precautions are to be taken in using this developer, which is different in the case of bromide paper. Here the gelatine film adheres so firmly to the paper that the developer may be used in its simplest form:—

Water ...	60 c.c.
Hydroxylamine ...	0.3 grammes
Caustic soda ...	0.4 "

without any addition of potassium bromide. The hydroxylamine developer should never be used for instantaneous exposures, but only for time exposures of landscapes and reproductions. Its action is very soft, and it gives much detail in the shadows; moreover it has the property that, for instance, the light sky in landscapes is restrained; consequently, the picture acts more harmoniously.

*New Developers for Gelatino-Bromide Paper.*—Dr. E. A. Just, the well-known manufacturer of photographic papers of Vienna, has just recommended the following formulas for gelatino-bromide paper, if reddish-brown tones, like those of albumen prints, are required:—

A.—Water ...	1,000 c.c.
Potassium oxalate ...	90 grammes
B.—Water ...	500 c.c.
Sulphate of iron ...	25 grammes
Citric acid ...	2 "
Potassium bromide ...	0.2 gramme



Mix it just before use, adding B to A. If 2 to 6 drops of a potassium bromide solution (1 to 50) is added, the tone of the paper will be warmer, and the development slower. For bluish-black tones, the following developer :—

A.—Water	...	...	...	600 c.c.
Potassium oxalate	...	...	...	100 grammes
B.—Water	...	...	...	100 c.c.
Sulphate of iron	...	...	...	30 grammes
Citric acid	...	...	...	2 „

Mix just before use. By addition of 2 to 10 drops of potassium bromide solution (1 to 50) the tone is successively altered, at first to pure black, then to brownish black, i.e., without potassium bromide, bluish black; with a small portion of potassium bromide, pure black; with much potassium bromide, brownish black. In mixing the two solutions, solution B must always be added to solution A, as otherwise a precipitate will be formed. For sepia tones the paper is at first developed in the bath for reddish-brown tones, until the half tones are well out, whilst the finer details in the lights are still wanted; then put it in the bath for bluish black tones, where, after being entirely developed, it will be much intensified, and the tone become dark brown. If the development proceeds too rapidly the print is rinsed between the first and the second bath with distilled water. After development the print is at once, without being previously washed, immersed for one minute in a solution of—

Water	...	...	...	500 parts
Acetic acid	...	...	...	1 part

Or,

Water	...	...	...	1,000 parts
Hydrochloric acid	...	...	...	1 part

Then in another similar acid bath, and finally in water. The fixing solution consists of :—

Hypo	...	...	...	1 part
Water	...	...	...	10 parts

#### *Yellow Fog and Yellow Stains in Gelatine Negatives.*

—O. Wilde, whose name has been long associated with dry plate photography, has published some interesting notes about the above named defect and its remedies. There is a difference, he says, between yellow fog and yellow stains in negatives. The yellow fog causes at first the plain parts of the plate, then the clear shadows, to acquire an intensely yellowish colour. It is not, as many suppose, produced during the preparation of the plate, but is always due to careless and inattentive manipulation during development and fixing of the negative. It is produced (1) if the negative after development is put into the fixing bath without being thoroughly washed; (2) if the fixing bath has often been used, and is consequently over saturated with silver bromide; (3) if the negative, after being apparently fixed out in such a fixing solution, is exposed to light without being thoroughly rinsed; (4) in the case of points 1 and 2 going together the yellow fog may already be produced during fixing, before the negative is exposed to light; (5) if too much of potassium bromide solution has been added to the developer; (6) if, in developing with oxalate of iron, hypo has been added just before finishing development, especially if hypo solution has accidentally been brought into contact with the developer. The remedies for yellow fog consequently are the following :—(1) Thoroughly washing after development; (2) to use a fixing solution which has not often been used, and which has always been freed from any precipitate by filtering; (3) to allow the plate to lie for a somewhat longer period in the fixing solution than is required for dissolution of the whitish silver bromide; (4) careful application of potassium bromide solutions during development; (5) to prevent the addition of hypo during development. If it is desirable to use hypo, it should only be applied as a short preliminary bath, and very much diluted

(1 to 5,000); or directly in mixing the ferrous oxalate (5 to 10 drops of a solution of a solution of 1 : 200 to 50 cc. of the developing solution); or, finally, as an addition to the sulphate of iron solution (a small piece of about 0.1 gramme to 100 grammes of iron sulphate). A negative which, after development, has thoroughly been washed, will show no yellow fog in a fixing solution, having not yet or seldom been used, and being freed from any precipitate, even if it is exposed to light during fixing, provided that in developing neither potassium bromide nor hypo have given rise to yellow fog. In developing with pyro sometimes the whole negative shows a yellowish veil, which is prejudicial to the printing qualities of the negative; this disaster is generally called yellow stains. This defect can entirely be prevented by using the following mixture :—

A.—Sulphite of soda	...	...	...	100 grammes
Water	...	...	...	500 c.c.
B.—Sulphite of soda	...	...	...	50 grammes
Water	...	...	...	400 c.c.
Add to this, when thoroughly dissolved :—				
Alcohol, absolute	...	...	...	100 c.c.
Pyro	...	...	...	45 grammes
Citric acid solution (1:10 water)	...	...	...	45 „

#### C.—Carbonate of potash solution (1.5 water)

The carbonate of potash must of course be chemically pure. For use mix—

Solution A	...	...	...	50 cc.
„ B	...	...	...	4 to 6 cc.
„ C	...	...	...	4 to 8 cc.

(according to the contrast or the softness which is to be obtained).

The addition of alcohol to the pyro solution makes it very constant. Moreover, this pyro solution leaves the fingers free from stains.

*New Photographic Publications.*—W. Knapp, of Halle, has just published “Professor Eder’s Year-Book for Photography, for 1888.” This is a very important book, containing many contributions of our renowned experimentalists, and a great number of good illustrations. Of Dr. Liesegang’s well known “Hand-Book of the Practical Photographer” has recently been published the 10th edition. It is no doubt one of the best and most comprehensive hand-books in the German language, and throughout practical. By Julius Klinkhards, of Leipzig, I have been favoured with a really magnificent volume in quarto, containing collotype prints, which are a testimony of the achievements of the house in this branch of art. Issued in an elegant binding, this sample book contains sixteen collotypes taken from nature, from engraving, &c. Those who are interested in this branch will receive a copy of the album post free on application to the firm of Julius Klinkhard, Liebig-Strasse 6, Leipzig.

## Reviews.

### EMERSON’S “HAYMAKERS.”

WE have here a magnificent plate, photo-engraved by Dawson (The Typographic Etching Company), from an original negative of Dr. Emerson, the size of the printed portion being twenty inches by fifteen inches and a half.

To begin with, the production is not one calculated to attract the praise of the average critic at a photographic meeting, as such average critic would probably at once condemn it as “flat,” “washed out,” or “weak;” but we imagine that neither photographer nor photo-engraver would be in any way displeased by such criticisms; for we take it that each has so far fulfilled his aim as an craftsman, as to have produced the kind of thing he wished to produce.



Emerson, we believe, clearly understands that the photograph—especially the outdoor view—which meets with most approval at the meetings of a photographic society now-a-days, is rather an index to the subject, in which the deepest shades and several degrees below them are brought close together; the highest light and the tints next to this being also similarly assimilated: producing what is called “sparkle.” Of course, this means something taken from the just proportional value of the middle tints.

In endeavouring to justly reproduce the relative proportions of all tints, we think that Emerson fully recognises that the limits between which he can work being so much nearer together than the interval between a brightly illuminated white object in Nature and a black (absence of reflected light), there is no alternative but to produce a picture which shall be somewhat “flat;” that is to say, if the just proportion is to be preserved between all the tints.

Let us not be misunderstood in our distinction between the ideal photograph of the average meeting-goer and the ideal photograph of the Emerson school. The former has every gradation represented, but out of true proportion; the differences between the grades near the two ends of the scale being reduced, while the differences between the middle tints are exaggerated, the result being a picture which is “bright” and possesses “sparkle,” as the conventional photographer terms it. Emerson and his followers, however, do not mind if their productions have not the much-admired “sparkle,” as long as the tints are truly proportional between the limits which the process allows.

“Pictures of East Anglian Life,” a series of thirty-two photogravures by Emerson, is announced by Sampson Low and Co., and we shall look forward to its appearance with much interest.

In the very highest terms we must speak of Dawson’s photo-engraving of Emerson’s subject, and it seems to us as perfect a rendering of the original as is possible. Moreover, we find no signs of retouching or afterwork upon it.

THE JOURNAL OF INDIAN ART, Nos. 1 to 21. January 1887, to January 1888. Large folio, 2s. per number. (London: Griggs, Peckham; Quarritch, Piccadilly.)

PERHAPS no illustrated publication of the present time so well represents the rapidly-growing capabilities of photography as a means of illustration, as does Griggs’ *Journal of Indian Art*. Apart from the simple photolithographic illustration in black, as reproduced from the original sketches of the artist, we have excellent stipple photo-lithographs from negatives after Nature, and then, again, we have collotypes of high class, which collotypes, we understand, Mr. Griggs works on the power press. But perhaps the most striking feature of the *Journal of Indian Art* is the magnificent work in several colours. No. 9, for example, contains coloured reproductions of Mooltan pottery—nine plates so fine that each would be well worth framing and hanging up in one’s room as a contribution towards the art education of those using the apartment.

We have in the series both chromo-collotypes and chromo-photo-lithographs, both being of the highest merit. The *Journal of Indian Art* should be in every public library, and we think, if its merit were generally known, the sale would be large.

## THE LITERATURE OF PHOTOGRAPHY.

BY W. JEROME HARRISON, F.G.S.

In the PHOTOGRAPHIC NEWS for the 1st of January, 1886 I commenced a series of articles on the Bibliography of Photography. Of the five classes into which I then divided the subject, the

“Class I., Printed Books, including some pamphlets; and several books of which photography forms an important part, though not the whole”—

occupied a part of six numbers of the NEWS in 1886, and of three numbers in 1887.

We now come to “Class II., Periodicals;” and I must confess they have given me more trouble than the books, though not so many in number. Magazines, journals, &c., have mysterious ways of being born, and of dying and then coming to life again, which is perplexing. Then the fancy seizes the editors to change the titles of their bantlings, and to amalgamate with other journals; or, perhaps, to undergo fission, and continue as two instead of one; or to reprint the weekly or monthly issues under another title, and style it an Annual. Then the dead periodicals—it would be an easier task to trace the genealogy of any given “John Smith” than to ascertain the precise date of demise of a forgotten periodical, whose circulation grew gradually less and less until it died of inanition. And then the details—who were the editors of this, that, and the other paper, and when did their respective reigns begin and end? The sizes, octavo, quarto, or what not, only to be ascertained by personal inspection, and the price. And there is the playful habit of some publishers of re-numbering the volumes of a series—beginning a new series every ten years, say. I scarcely think penal servitude would be too severe a punishment for this. Let any man who has tried to hunt up an old paper in the *Philosophical Magazine*, for example, or in *Notes and Queries*—knowing only the numbers of the volume—say if he does not agree with me.

It is pleasant to witness the steady growth of a desire to collect and study the invaluable records of the work of our predecessors. The Camera Club and the Photographic Club are striving hard to form good libraries, and it is earnestly to be hoped that this is an object which will be kept in view by every scientific society in the country.

In collecting my “periodicals” I have endeavoured to secure the title of every journal ever issued in the British Isles and Colonies, of whose title the word “Photography” formed a part. But I have been compelled to go farther than this, and to include in my list many journals which at some time or other devoted an important part of their space to our art-science, though they did not recognize this officially on their title-pages. The student of the history of photography before 1854 will find the *Athenæum* and the *Art Journal* mines of information on the subject, but he would not gather this in any way from their titles. My other general observations I shall reserve till the end of the list.

The mark ||, following a date, indicates that publication was then discontinued. The mark + means continued.

I shall feel very thankful for any corrections, and for additional information, which many of the readers of the PHOTOGRAPHIC NEWS are, I am sure, well able to afford.

For convenience of reference I have assigned a number to each periodical.

(1) ACADEMY (THE). A record of literature, learning, science, and art. Monthly, 1869-71; fortnightly to 1874; weekly to 1888 +; 4to. London; price 3d.

The *Academy* is a well written weekly, but the portion of it allotted to “science” is very small. It has been edited successively by C. W. Appleton, C. E. Doble, and J. S. Cotton.

(2) ALPINE (THE) JOURNAL. A record of mountain adventure and scientific observations, by members of the Alpine Club. Edited by H. B. George. 1864 to 1888 +. 8vo. Quarterly, February, May, August, November, price 1s. 6d.

Vol. xiii., for 1887, edited by W. A. B. Coolidge. Longman, Green and Co., Paternoster Row.

The *Alpine Journal* has included many notices and references to photography as pursued under the special difficulties which it is the delight of mountaineers to meet and



to overcome. Captain Abney is well known as an active member of the Alpine Club, and it includes in its ranks many other good photographers.

(3) **AMATEUR (THE) PHOTOGRAPHER.** A popular journal devoted to the interests of photography and kindred arts and sciences. Weekly, 4to. Scientific Publishing Co., 22, Buckingham Street, Adelphi. Price 2d. No. 1 was issued Friday, October 10, 1884.

Vol. i., to April 3, 1885; pp. iv. and 432; vol. ii., to end of 1885; pp. xii. and 644; vol. iii., January to June, 1886; pp. viii. and 312, with extra number for April 30th, "Home Portraiture;" 1s. Vol. iv., July—December, 1886; pp. viii. and 324, and extra numbers September 10 and December 10; 1s. each. Vol. v., January—June, 1887; pp. viii. and 316, extra (Jubilee) number, June 21. Vol. vi., July—December, 1887, pp. viii. and 328, and extra number ("Home Portraiture") for October 7, 1887 +.

We believe that Messrs. J. Harris Stone and C. W. Hastings have conducted the *A.P.* from its commencement. The present editor is Mr. Hastings.

(4) **AMATEUR WORK ILLUSTRATED.** A practical magazine of constructive and decorative art and manual labour. 4to. Edited by the author of "Every Man His Own Mechanic." 1881-88+. Monthly, price 6d. Ward, Lock and Co., Salisbury Square. About 48 pp. in each number, with folding plans, &c. Several useful articles on the manufacture of photographic apparatus by C. C. Ververs, J. H. Richardson, and others, have appeared in the later numbers of this magazine.

(5) **ANALYST (THE).** A Monthly Journal of Science, Literature, and the Fine Arts. 8vo. vol. i. and ii. London, and Worcester. 1834-35.

Continued as:—

(5a.) **ANALYST (THE).** A Quarterly Journal of Science, &c., vol. vi., edited by W. Holl and N. Wood; vol. vii., by W. Holl, E. Mammatt, and N. Wood, vols. viii., x., by E. Mammatt, London and Birmingham—1835, 40, 8vo.

(6) **ANNALS (THE) OF CHEMISTRY AND PRACTICAL PHARMACY.** Being a weekly summary of the discoveries of philosophers, chiefly continental and transatlantic, in their applications to the chemistry of medicine, agriculture, manufactures, and to the several branches of physics, electricity, galvanism, photography, &c. One vol. only published, 8vo. London, 1843.

(7) **ART UNION (THE).** A monthly Journal of Fine Arts; 1839-48; 10 vols.; royal 4to. 10s. 6d. to 21s. per vol. Published by Chapman and Hall. No. 1 was published February 15th, 1839, price 8d.

Continued as:—

7a) **ART JOURNAL (THE).** 1849-84. Monthly, price 2s. 6d., or 31s. 6d. per vol.

Continued as:—

7b) **ART JOURNAL (THE).** New series. 1885-88+. Folio. Monthly, price 1s. 6d. J. S. Virtue and Co., 26, Ivy Lane, Paternoster Row. Each number contains 32 pp. of letter-press and one plate.

The beautiful plates and illustrations of the *Art Journal* have always rendered it worthy of study by photographers; but many papers upon photography and photographers have appeared in its columns, most of which were written by Robert Hunt.

(8) **ARTS, JOURNAL OF THE SOCIETY OF.** 8vo., weekly; price 6d. 1852-88+. Bell and Sons, York Street, Covent Garden.

The principal feature of this periodical is that it contains, verbatim, the lectures delivered before the Society in the excellent rooms in John Street, Adelphi. Captain Abney, Messrs. Polas, W. K. Burton, and other well-known photographers have lectured there; and more than one exhibition of photographs and apparatus has been held. In the present Secretary (Mr. H. T. Wood) the Society is fortunate in having a gentleman whose knowledge of photography is not less than that possessed by his eminent predecessor—Mr. Le Neve Foster.

(9) **ASTRONOMICAL (ROYAL) SOCIETY, MONTHLY NOTICES OF THE.** Containing papers, abstracts of papers, and reports of the proceedings of the Society. 8vo. Price (to subscribers) 10s. per annum, post-free, from W. H. Wesley, Burlington House, London, W. Vol. xlvii. (for 1887) includes nearly 600 pp., and contains eight papers by Professor Pritchard, Dr. Dreyer, and Messrs. Grubb and Roberts, on "Stellar Photography."

(10) **ATHENÆUM (THE).** Journal of English and Foreign Literature, Science, and the Fine Arts, Music, and the Drama. 4to. 1828-88+. London: 22, Took's Court, Cursitor Street, Chancery Lane, E.C. Price 3d.

In the early days of photography—1839 to 1850 or thereabouts—the *Athenæum* published many articles and notes on photography; being, in fact, quite a recognised medium of communication for photographers.

(11) **AUTO TYPE NOTES.** This is a little periodical (published quarterly or thereabouts, we believe) issued by the Autotype Co., 74, New Oxford Street, W.C. Gratis for private circulation amongst their customers. It first appeared in the year 1877, and has contained much information on the subject of carbon printing.

## PHOTOGRAPHIC PROGRESS.

BY RICHARD KEENE.\*

IN the absence of our esteemed president, and for the want of a better substitute, it has devolved on me to say a few words on our beloved art or science, or whatever you may please to call photography. Call it what you may, it has become a recognised want of almost every man and woman in the whole civilised world. Perhaps you can imagine what the effect would be, if the power which we have learned to make so useful in every phase of life, and to enhance our pleasure in and appreciation of the beautiful, were suddenly lost. I cannot. Photography is no longer an infant, but has grown into a shapely youth with a great future before him; a youth full of energy and aspirations, soaring to heights we dream not of. Let us look for a few minutes at his past career and present acquirements.

Photography lay in embryo many years, but at its birth in 1839, Niepce and Daguerre stood as godfathers. Daguerreotypes show how beautiful was his infancy. Fox Talbot quickly took him in hand whilst still in swaddling clothes; and this period is remembered by many beautiful landscapes and crumbling ruins through which the infant was taken by the aid of paper first prepared with gelatine, arrowroot, and other substances suitable to the babe. Much later, Scott and Archer discovered the collodion process—this was in the well-remembered year, 1851. Photography was now a fine growing boy, and astonished all his friends and enemies (for he had enemies) by the great progress he made in usefulness and beauty. Various were the processes he had to go through beside the prevailing wet one; for some treated him with eggs, some with tannin, some with tea or coffee and sugar, and some even—I was one of them—with beer. Under each and all of them he thrived and behaved remarkably well, and his friends increased accordingly. But a time came, only a few years ago, when many clamoured that the hobbled boy should be brought up on gelatine, and it was so; and the wonders photography has since been able to accomplish are marvellous.

But let us drop metaphor, and in as few words as possible note some of the later triumphs of photography. In the first place you must be aware that all the apparatus, including lenses, have been vastly improved, and that it is not alone due to our present rapid plates that the great advance in photography has been made. If you look at some very old prints you may find the walls of a tower, or the sides of the houses in a street, tumbling inwards; sometimes even they appear barrel-shaped or bellying out in the centre. Improved swing-backed cameras and rectilinear lenses have obviated such distortions as these.

Sensitive plates are now made by the gelatino-bromide process fifty times as quick as the ordinary wet plate, and these are found useful in securing objects in motion. Hence we have the necessity of making a much more rapid exposure than could possibly be executed by the hand; so drop-shutters and snap-shutters of marvellous mechanism, from numberless patentees,

\* Copy of Address at Derby Conversazione.



immediately rose to our aid, enabling us to make an exposure of less than the hundredth part of a second when required; and so sensitive are the plates that we can secure the most evanescent appearance of nature at any fraction of a moment—such as the breaking billows on the sounding shore, and ships in full sail, a galloping horse, the fast-flying train, or the flight of birds; yea, even the lightning's flash. These and many other astonishing feats have been accomplished by what is called instantaneous photography. For my own part I prefer the green pastures and still waters of our art, and even here quick plates are sometimes advantageous in securing cattle and figures in landscape work more easily, or in getting dim interiors of old halls and churches, once all but impracticable, or at any rate underdone and devoid of much lovely detail.

One of the latest changes, hardly perfected as yet, is film photography, the main idea of which is to do away with glass as a support for the negative, and thus lighten the labours of the landscape photographer. Long slips of prepared sensitive film are supplied in rolls or spools; these fit in a very ingenious holder, and as the views are taken they are wound from one roller to another, a clockwork register keeping count outside the holder till the whole slip is used, when it is easily replaced by another spool.

As many as forty or fifty pictures may be taken on one of these slips, which is afterwards cut up into view-lengths, marked out automatically by the same holder during its use, and developed at leisure. The saving in weight is very great, for a hundred negatives by this method will entail less labour in carrying than half-a-dozen taken on glass. For foreign travel they are inestimable.

In speaking of films and roll-holders, I am reminded of another important branch of photography brought to great perfection by the same firm—Messrs. Eastman and Walker—of printing or enlarging on gelatino-bromide paper. By this process, from an ordinary negative, prints may be got in a few seconds' exposure to gas-light; hence it has found much favour with amateurs and others who have not much time to spare during the day. Enlargements are also easily and rapidly made. Several specimens will be found on the walls by our members, and I have added one of Mr. Walker himself, taken by Nadar, of Paris, to show how much the process is capable of.

You will have opportunities, at intervals during the evening, of seeing how these prints are produced; also of another interesting branch of our art—the development of platinotype prints—the most artistic outcome of photography yet discovered, and which are rapidly gaining favour with the public, not only on account of their permanency, but for softness and beauty, more resembling good mezzo-tint engravings than aught else. Many specimens you see on the walls. Progress is at work here too. Pizzighelli's labours will probably give great impetus to the work, while the Platinotype Company are bestirring themselves, and will shortly introduce great improvements.

I must not close my remarks without a word on the giant strides made by photography in the way of book illustrations. Scarcely can we take up a magazine or other fully illustrated work, but we see photo-blocks of some kind or other gradually but surely creeping in; and though in many cases they are anything but beautiful—in fact, mere dirty smudges—yet in others they are beginning to hold their own against the wood engraver, the lithographer, and even the engraver on steel, as may be seen from the productions of Messrs. Goupil and Co., a few of whose specimeous decorate our walls, and to which I invite your attention.

I shall close by naming one of the latest phases of photography, called orthochromatic, or isochromatic, which, during the past year, has received much attention, and wonderful are the results. It is known to most of you that the haloid salts of silver are but little sensitive to green, yellow, or red rays of light; hence you will have observed that these colours appear darker in a photograph than they do in nature. Other colours, again, appear lighter—blue or violet, for instance—so that a lady dressed in a deep blue dress and a yellow neckerchief would appear in a photograph with her dress the lighter colour of the two. So it is throughout the whole scale of colours: photography does not give a correct value of them; for if you expose properly for one colour, you destroy the other. This is painfully apparent in copying a coloured drawing. Orthochromatic photography does away with this to a very great extent already, and we can now get a comparatively true rendering of pictures and other objects. This improvement is effected by soaking the ordinary gelatine

plate in a weak solution of ammonia for two or three minutes, and then for the same time in another of erythrosin, after which it is dried, and is ready for use, being much increased in sensitiveness, and more especially to yellow and green. The blues and violets are, however, still too active, but are quietened by interposing a disc of yellow glass, or other transparent medium, between the object and the lens, and thus the proper result is brought about. Such is a rough idea of the process; it would take up too much time to further illustrate here.

Several of you who were present at Mr. Bothamley's admirable lecture on the subject will remember the marvellous results he then showed on the lantern screen. Mr. Wellington is another earnest worker in this direction, so is our President, and I have no doubt great changes will be effected. Prepared plates are already in the market, and are getting into more frequent use.

I have kept from technicalities as much as possible, for in a mixed audience such as this they would be flat, stale, and unprofitable. I hope I have not wearied you. My subject would suffice to fill a goodly volume, and the difficulty has been what to leave, and what to cull from so wide a field. But I hear someone say, "You have told us nothing about the taking of photographs in natural colours—when will it be done?" Echo answers—"Be done!"

## Notes.

The chocolate tint, so long regarded by the public as identified with photography, still holds its own, but when the public get familiar with argentic bromide and platinotype, it will be probably ousted from its position. The other day a little discussion took place between the editor and sub-editor of a certain paper as to the hue of some photographic reproductions it was proposed to issue. The acting editor preferred the cold tint, as being more suitable to the subject. "No," said the editor, "it will never do. We must have the chocolate, or people won't believe it's done from a photograph. We ought to have it as like the real thing as possible." It may be as well to add, perhaps, that the editor knew very little of photography, and probably had never seen either a bromide or platinotype print. In connection with this question of tint, it may be said that among amateurs the taste for cold tones is certainly growing.

Photography has been adapted to so many curious uses that it would not be safe to pooh-pooh one of the latest suggestions for its employment. It is now proposed, in fact, that an "instantaneous camera" should be added to the official "properties" which are at present to be seen on Mr. Speaker's table in the House of Commons. That is to say, it is suggested that in addition to the sand glass which is turned when a division is called, and the brass-bound boxes which are thumped by the leaders of the House and the Opposition, there shall be a conveniently placed photographic apparatus so arranged that the Speaker or some authorised deputy may be able to save honourable members this trouble of trotting through the lobbies whenever there is a division, by photographing the Ayes and Noes as they stand up in their places instead. So that if this plan were carried out, Mr. Speaker, or more probably an official parliamentary photographer specially appointed, would begin to focus his lens as soon as the sand glass were turned, and drop in a prepared plate at a signal from the Chair. But it seems to us that such a suggestion as this, which bristles with difficulties, cannot have been made by



anyone who is either a good photographer or a practical man. Much as we should like to see the division in Parliament chronicled by means of what would be virtually a photographic Hansard, we cannot but see the numerous objections to the adopting of the plan proposed. For instance, even if every member loyally did his best to make the negatives a success, and conscientiously refrained from wriggling in his seat, or yawning, or otherwise imperilling the success of the operation, there would still be insurmountable difficulties in the carrying out of the plan. But we cannot even suppose that every member would do his best to make the new method work. Is it not probable that obstruction, which finds so many opportunities for displaying itself, would eagerly seize on this fresh and easy way of causing delay? We have only to think of the mischief one enterprising Irish Member could effect, and in how many ways he could make the efforts of the Official Photographer null and void, to at once see how wholly improbable the professed method of shortening the time spent in taking divisions would be. It will be a long while, we fear, ere the official camera will be included with the mace and the sand-glass in the recognised furniture of Mr. Speaker's table.

We have spoken before of that careless mintage which has made the new Jubilee coins a laughing-stock, and which careless work might well have resulted in a thorough change in the directing staff of the Mint; but one bad point we have not yet touched upon, namely, the very slovenly way in which the Jubilee head and bust has been proportioned to the sizes of the various coins; a defect which might have been obviated if some one in the Mint had been able to use the camera.

In the case of a shilling now before us, head, bust, and crown fit easily into the allotted space, and, indeed, there is about a thirty-second of an inch to spare between the top of the crown and the rising part of the rim, while in a five shilling piece the fit is pretty close, the tip or tuft of the crown coming right up to the edge of the flat of the coin; but a sixpence now before us shows the scale of the figure is larger in proportion, so a little bit of the crown has been cut to get the figure in.

Two coins, which may either be half-crowns or two shilling pieces, show not only a similar mutilation of the emblem of Royalty, but also a very clumsy damage to the dotted circle where the truncated Crown joins in, and this bad work is manifest in each case, though the two coins are from different dies.

Even if the mechanical execution of the coinage were good, instead of being so deplorably bad, the reproach of sending out sixpences which, when gilded, have freely passed as half-sovereigns, five shilling pieces which have been easily passed as five-pound pieces, and two-shilling pieces so like half-crowns as to make it often difficult to know which are which, ought not to be an easy one to wipe off.

Commenting on the enormous strides which photography has taken of late years in regard to the reproduction of paintings, prints, &c., the *Printing Times and Lithographer* tells a story of Edouard Detaille, the celebrated painter of military subjects. He noticed in the window of a shop he passed every day on his way to the studio a water-colour drawing of his own. Sometimes it would disappear for a day or two, and then would reappear. At last, unable to bear the irritating apparition any longer, he burst brusquely into the shop one morning, and said, "Since you can't persuade anybody to buy that drawing, I will buy it myself." "Oh, but, sir," the shopkeeper replied, "it is having a large sale." "What do you mean?" said the painter; "how can a water-colour drawing have a large sale?" It is the fac-simile of your drawing, sir." And when he had examined it closely in his hands he found that it really was the fac-simile. The story is all very well so far as it goes, but we may ask, what had become of the copyright?

It is curious how some artists authoritatively pronounce an opinion upon photography without knowing anything as to what it can do, or even what a photographic negative looks like. An amateur photographer and an artist were chatting a short time ago, when said the amateur, "Would you not find photography useful?" "Not a bit of good," replied the artist, decidedly, "except to get hold of a cow, or a goose, or something of that sort. Always a nuisance, you know, to be obliged to chase one of these creatures when you want to draw it. I daresay photography would come in handy so far as they're concerned, but for a landscape—should never think of attempting it." A few minutes after the amateur showed the artist some photographs—portraits—he had taken. "First-rate—capital!" exclaimed the artist. "But I suppose before they are touched up they look very different. When a photograph is just taken it always makes your face look like a map, doesn't it?" It was with some difficulty that the amateur convinced him that the photographs had never had so much as a pin's point in the way of touching-up applied to them. Should the artist in question ever dabble in photography he would soon find out how he had misjudged. Every artist we know who has taken up the camera is enthusiastic over the assistance he has derived from it in various ways.

#### ORTHOCHROMATIC PHOTOGRAPHY.

BY E. SENIER.

ALTHOUGH it is found that gelatine plates which have been rendered sensitive to the spectral rays of lower refrangibility by being steeped in an aqueous solution of eosine together with ammonia greatly exceed in general as well as "special sensitiveness to yellow" those in which the dye solution has been added to the emulsion, no reason appears to have been given to account for the difference. Some experiments in that direction may, therefore, not be without interest. A solution of ammonia and water in which some gelatine plates had been bathed was found, on evaporation, to have deposited microscopic crystals; and when the dye was added to the solution, the crystals deposited were of a ruby colour. This seemed to indicate that some silver bromide had been dissolved



from the films, and that on the addition of the dye the two together were deposited in a solid state, showing that a combination had taken place between the two. It was argued from this that the same thing would occur when a dry plate was immersed in an aqueous solution of dye and ammonia, and that the sensitive salt would be deposited on the surface of the film as well as in it, and consequently in direct contact with air, when if the reduction of the silver bromide was due to the oxidation of the dye itself, it would be in the most favourable condition to take place, whereas if the emulsion itself was treated, the sensitive substance would be covered with a protecting layer of gelatine, and consequently preserved to a great extent from contact with the atmosphere. A plate was rendered orthochromatic by bathing in the dye solution together with ammonia, and dried. One half was then coated with a solution of gelatine and dried. Another plate, similarly treated, was coated over half its surface with plain collodion, and also dried. These plates were then exposed on a colour scale, "using a yellow glass behind the lens to cut off the requisite amount of blue," and on development the half of the plate covered with the coating of gelatine scarcely showed any image, while the unprotected half developed strongly, and was fully exposed. The other negative did not show a very great difference between the two halves, although the portion covered with collodion was rather less dense. In the case of plates in which half was coated with gelatine the sensitiveness was found to be inversely proportional to the quantity of gelatine. The sensitiveness altogether compared with plates in which the emulsion itself had been treated. At first sight it would seem inexplicable why there should be this difference, but when it is remembered that gelatine is a homogeneous, whereas collodion is a porous, substance, some light may possibly be thrown on it. In the former case the gelatine prevents the air from penetrating so readily, and consequently the oxidation of the dye is retarded, and the consequent reduction of the silver bromide. In the case of collodion it allows free access of the air, "one reason why collodion dry plates required a preservative," and consequently the oxidation of the dye is not retarded. If, as these experiments seemed to indicate—that silver bromide is dissolved and precipitated on the film—a dry plate after treatment with a solution of ammonia and water and drying, should, on steeping in an aqueous solution of dye, give a greatly superior general as well as special sensitiveness to yellow than would be given with a gelatine plate simply bathed in a solution of dye without ammonia.

To test this a plate was soaked in a weak solution of ammonia and water, and when dry in an aqueous solution of dye, and again dried; the resulting negative gave as good an orthochromatic effect as when the ammoniacal solution of dye was used together, but the rapidity was not quite so great. This might be accounted for by the fact that the surface only of the silver bromide would be in contact with the dye, whereas when the whole was in solution together the silver bromide would be coloured throughout, or at all events more closely in contact with the colouring matter, and therefore in a condition to be more easily affected by any minute change in the dye itself. That the oxidation of the colouring matter precedes the reduction of the silver salt seems to be borne out by the fact that if a plate is exposed in a solution of potassium nitrite, very little action takes place even after a prolonged exposure; whereas if it were due to the dye acting the part of an optical sensitizer, the sensitiveness, if anything, should be increased, since the sensitive compound is in direct contact with a powerful halogen absorbent. On the other hand, if it be due to a secondary action dependent on the oxidation of the dye, the potassium nitrite being itself an absorbent of oxygen, would most probably account for the insensitiveness when this substance is present. The principal objection to the oxidation of the dye being the cause of the increase of sensitive-

ness to the less refrangible rays seems to be based on the fact that time is required in order for the dye to bleach by oxidation; but is it not possible that by the time the action has proceeded so far as to render the change visible, that oxidation has taken place to a very considerable extent, and that from the moment the light falls on the body the action commences, and though invisible until a considerable number of particles have been acted upon, is quite sufficient to upset the equilibrium of the silver bromide, and for a nucleus upon which development can take place?

Again; is it not possible that the tendency of the dye to oxidize is strengthened when in molecular combination with silver bromide by the property of silver bromide to yield deoxidizing bromide in the light, and this is further accelerated by the small quantity of ammonia remaining in the film or absorbed by the silver bromide itself?

However, whatever may be the cause of the difference in sensitiveness when ready prepared plates are bathed, or the emulsion itself treated, seems to be intimately connected with the gelatine, and anything that may tend to unravel the mystery surrounding this most valuable process will be a further addition to the science of photography.

## Patent Intelligence.

### Applications for Letters Patent.

582. THEOPHILUS HORNE REDWOOD, 53, Chancery Lane, London, for "An improved lamp or apparatus for use in photographing by artificial light."—Jan. 13, 1888.
614. JOSEPH BROWN, Cluny Lodge, London Road, Norbiton, Kingston-on-Thames, for "Improvements in camera dark slides for photographic purposes."—Jan. 14, 1888.

### Specifications Published.

541. JAMES ASHFORD, 179, Aston Road, Birmingham, Photographic Apparatus Manufacturer, for "Improvements in photographic cameras."—Dated, January 13th, 1887.

The patentee says:—The object of my invention is to so arrange the parts of the camera, that when the camera is closed up, the front of the camera will fold over, and cover the back of the camera in which is the ground glass or focussing screen, and so protect the focussing screen from injury. I propose effecting my purpose as follows. I make an ordinary sliding camera base board; at one end of base board I attach the lower edge of the front part of camera in a suitable manner, by a hinge or hinges, and in such a way that the front of camera may be made to assume with the base board, positions either parallel, perpendicular, or acute or obtuse angles.

2634. FRANK BISHOP, of the firm of Marion and Co., of Soho Square, in the County of Middlesex, Manufacturing Photographic Stationers, &c., for "An improved photographer's lantern."—Dated February 19th, 1887.

The invention consists essentially in the employment of a coiled spring for distending the coloured media or fabric forming the sides of the lantern, in such a way as to permit of its being readily collapsed. The lantern may be of circular, square, or polygonal form in cross-section, and its sides are formed of one or more thicknesses of coloured fabric or flexible medium, which may either be bellows-like or plain, so as when collapsed to fold regularly or irregularly as preferred, and it is connected at top to a cap, and at bottom to a ring, between which is fixed a strong openly coiled spring that runs around the internal circumference of the lantern, and tends to force the ring and cap apart, so as to hold the flexible fabric distended. By this construction, the lantern may be compressed into a compact form for transport, and will be instantly distended in readiness for use when required.

- 15,722. HENRY SUTTON, of Ballarat, in the Colony of Victoria, for "An improved process of converting a photographic image on a gelatine surface into a relief or intaglio printing surface."—Dated 16th November, 1887.

It is well known that relief and intaglio printing surfaces can be produced from photographs, but in practice these have been



principally confined to the production of linear work, on account of the difficulty of faithfully representing the delicate shades of what are known as the "half-tones." When such half-tones have been represented, it has been due to the exercise of very great manual skill, and when produced, it required very great care and ability on the part of the printer to produce a satisfactory representation on paper.

It is well known that the half-tones of photographs may be "broken up" by dot, stipple, line hatch, grain, or other pattern.

I know of no method by which a photographic image on a gelatine surface can be automatically converted into a relief or intaglio printing surface.

Now, this invention is designed for the especial purpose of automatically converting a photographic image on a gelatine surface into a relief or intaglio printing surface which will faithfully represent the delicate lights and shades or "half-tones," said printing surface being of such a kind that an ordinary printer with ordinary appliances can without difficulty utilise for printing purposes.

In carrying out my process, I take an ordinary sensitised gelatine plate bearing a photograph, "broken up" by any pattern or grain as before described, and I immerse it in water, the temperature of which must be below that at which the particular gelatine used will melt or dissolve. Here I allow it to remain until all the gelatine swells by absorption of water, but the extent to which this is allowed must be determined by the character of the picture and the judgment of the operator. After removing the plate from this bath, I remove the free water from its surface, preferably by a slight rinse in alcohol or spirits of wine. I then subject this plate to a gradually increasing temperature until it reaches about that at which the particular gelatine used begins to melt, and I continue this heat until all or nearly all the water or moisture is driven off.

The result of this is that those portions of the gelatine which are unaffected by the action of light, and which are freely absorbent of water, melt and are drawn by capillary attraction under the unmelted portions, forcing the latter up in relief, the dots, stipples, lines, grains, hatch, or other pattern by which the photographic image is broken up, being graduated in size and form in precise proportion to the action of light, and of light and development on such photographic image. This completes my process.

If the photographic image on the plate heated be a "negative," the printing surface produced will be in intaglio; if it be a "positive," the surface will be in relief.

If the gelatine be on a sufficiently thick sheet of glass, or on wood or metal, or other hard material, it may be used direct in a typographic press, or if on metal or other suitable surface it may be used direct in the copper-plate press; but if it be on the ordinary thickness of glass, electrotypes or stereotypes must be used for the copper-plate press. I find that electrotypes and stereotypes may be made from my printing surfaces in the same way and much more easily and quickly than from ordinary engravings, inasmuch as I can electrotypes direct on my printing surfaces, thus saving the usual "wax squeeze," and I can cast stereotype metal direct on my printing surfaces without the intervention of the paper or plaster moulds used in stereotyping.

In actual practice I have taken an ordinary gelatine dry plate, Fry's transparency make, and have impressed an image thereon by the action of light, such image having its surface diversified or broken up by the ordinary wire gauze pattern, and have then developed and fixed the image in the usual way; I have then immersed this for five minutes in water of the temperature of 80° Fahr., and have then removed the free water by dipping the plate in a bath of spirits of wine for ten seconds, and have then removed the plate and fanned the spirits of wine dry from its surface; I have then placed it on a copper-plate supported on feet or legs, and heated it by means of a Bunsen gas burner until it became about the temperature of 212° Fahr. This heat I have continued for two minutes, when I have found my object accomplished.

I do not confine myself to any particular uses to which my printing surfaces may be applied, and I wish it to be distinctly understood that I do not claim the production of photographic pictures on gelatine plates broken up or diversified by dot, stipple, grain, or pattern of any kind, nor to the immersion of such plates in water for the purpose of causing the unaffected gelatine to swell and rise into relief, as I am aware that all this has been done before.

Having now particularly described and ascertained the nature

of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

In the process of converting a photographic image on a gelatine surface into a relief or intaglio printing surface—the application of heat to such gelatine surface after it has been immersed in water in the manner and for the purpose substantially as herein described and explained.

16,003. WILLIAM WILLIS, of Bromley, in the County of Kent, Manufacturer, for "Improvements relating to photo-chemical printing."—Dated 21st November, 1887.

My invention has for its object the production of photographic pictures or images in platinum, by improved methods of carrying into effect the process described in the specification of my former Letters Patent dated February 2nd, A.D. 1887. No. 1681.

By the said process I have been enabled to produce pictures of excellent quality, and to greatly diminish the cost of the platinotype process and obtain other important advantages. I have, however, found that I do not, in using the process as described in the said former specification, in all cases obtain an absolute uniformity of tone or colour or monochromatic effect in the picture, that is to say, although the shadows will be of a pure black tone, there will be sometimes a slight trace of brown in the high-lights of the developed picture. This is a defect which does not impair the value of a photographic print in respect of accuracy and other qualities, but the presence of two colours may be considered offensive to good taste. In the picture of a landscape, for instance, it is generally conceded that the foreground shadows should be warmer in tone or colour than the high-lights and delicate distance, or certainly not colder.

Now although I have not succeeded in producing pictures in which the darker parts or shadows are warmer in tone than the lighter and more delicate portions or high-lights, yet I have as one result of my present invention provided for carrying into effect the said process with the certainty that the tone or colour shall be uniform throughout—that is to say, I can be sure that no part shall be of a warmer tint than another part of the picture.

The process described in the specification of my said patent No. 1681 is distinguished from former processes of mine chiefly by the fact that the platinum is contained entirely in the developing solution, that is to say, I described a surface coated with ferric oxalate (with or without a salt of lead or of mercury and without any platinum) and the use, for developing the image or picture thereon, of a solution containing a salt of platinum, in all cases mixed or combined with a phosphate or other salt in which the ferrous image is insoluble, and sometimes with other salts. I now find, however, that, by ensuring the presence or contact of a salt of mercury or of lead with the image or picture at the time of its development, I obtain a better reducing action, and avoid the necessity for using in the developing solution phosphates or other salts for rendering the ferrous image insoluble, the presence of which salts, as far as I have been able to observe, is the cause of, or is accompanied by, the defect in the tone or colour of the picture.

I therefore now proceed according to the following method, that is to say, I coat paper or other material with ferric oxalate, together with a salt of mercury or of lead, or both. Then I expose the coated surface to light under or behind a negative, or other suitable screen, and then develop the ferrous image produced, by the action of light, with a solution containing a salt of platinum, together with a salt of oxalic, or citric, or tartaric acid, or mixtures of these, or together with other substances which aid in the reduction of the metal from the salt or platinum by the ferrous image produced as aforesaid.

Or I adopt the following method, viz., I use a surface sensitized by ferric oxalate alone, and then, after exposure to light, develop the picture or image with a developing bath or solution containing one or more of the above named salts or substances which aid in the reduction of platinum in the manner aforesaid, together with a salt of platinum and also a salt of lead, or of mercury, or both, but in this case preferably the salt of lead.

It will be observed that the lead or the mercury, one or the other of which is in all cases essential in the practice of my invention, is in the one case present in the sensitive coating of the paper before its exposure to light, and in the other case is wholly in the developer. But for some purposes I use a salt of mercury or of lead, both in the sensitive coating of the paper and in the developer.

In practising my invention according to the first method above described, I coat the paper or other surface with ferric oxalate



(or with a compound or mixture of the same and other oxalate of an alkali metal) together with a salt of lead or of mercury, or of both. The salts of lead which I find best for my purpose are the nitrate and chloride. If I use salts of mercury, I employ only the mercuric salts, and of these I prefer mercuric chloride. The ferric oxalate and the lead or mercury salt can be applied together in one solution, or the said salts may be applied separately in solution to the paper or other surface. I usually apply them in one solution. When they are applied separately, the paper or other surface should be dried between the coatings.

In some instances I employ an aqueous solution of ferric oxalate containing in each fluid ounce about sixty (60) grains of the oxalate  $\text{Fe}_2(\text{C}_2\text{O}_4)_3$  more or less according to the result desired to be obtained. And I add to or dissolve in each ounce of this solution one (1) grain of plumbic chloride and one (1) grain of mercuric chloride.

I sometimes omit the lead salt from this solution and increase the quantity of the mercuric salt, that is to say, instead of one (1) grain of mercuric chloride I use two or more grains of this salt.

The paper thus coated, after being thoroughly dried, is ready for use. After its exposure to light under or behind a negative or suitable screen, I apply to it the developing solution.

I prepare this developing solution with potassic oxalate and potassic chloro-platinite as described in the specification of my former Letters Patent No. 2800 A.D. 1878. I prefer to use an aqueous solution of these salts containing in each fluid ounce about ninety (90) grains of potassic oxalate and nine (9) grains of potassic chloro-platinite.

Or I use, for developing, an aqueous solution containing in each fluid ounce about sixty (60) grains of ammoniac tartrate and eight (8) grains of ammoniac chloro-platinite.

Or I make developing solutions with any of the other salts or substances herein-above mentioned as applicable for this purpose, or with other salts which tend to aid in the reduction of the platinum salt by the ferrous image produced by the action of light. In practising my invention according to the second method hereinbefore specified, I first apply to the paper or other surface a coating of an aqueous solution containing about sixty (60) grains of ferric oxalate in each fluid ounce of solution. I then dry the coated paper, and then, after exposing it to light under or behind a negative, I apply to it the developing solution.

For this developing solution I sometimes employ an aqueous solution containing in each fluid ounce about ninety (90) grains of potassic oxalate and nine (9) grains of potassic chloro-platinite. To this solution I add a solution of a salt of lead, preferably the acetate, until a permanent precipitate begins to form. If I use a salt of mercury instead of a salt of lead I prefer the mercuric chloride, of which I dissolve (or add) about five (5) grains in each fluid ounce of the said solution. The salts of mercury do not in all cases ensure a monochromatic tone in the picture, but in other respects they afford good results.

Or I use a developing solution containing a salt of platinum and a salt of lead, or of mercury, and one or more of the other hereinbefore specified salts of oxalic, citric, and tartaric acids or substances; but when a salt of lead is employed, there must be no salt used in the developer, which would entirely prevent the solution of the lead salt. These developing solutions containing lead or mercury salts, or both, can also be used for developing photographic pictures or images on paper and other surfaces which have been coated with ferric oxalate, together with a salt of lead or of mercury.

I sometimes apply the constituents of the developer separately, or in two solutions, to the sensitive surface after it has been exposed to light. In this modification of my process, I first apply a solution of plumbic acetate or of mercuric chloride to the said surface, and then quickly, without washing or drying the surface, apply to it, in solution, the remaining constituents or ingredients of the developer.

The developing solutions mentioned in this specification I prefer to apply cold, but occasionally I apply in a heated state such of them as are not decomposed by heat.

The salts of platinum which I prefer to make use of in the developers herein described, are the platinum salts, viz., the ammoniac, potassic, and sodic chloro-platinites, the ammoniac, potassic, and sodic bromo-platinites, or mixtures thereof; but in some instances I use a small quantity of a platonic salt, such as the ammoniac, potassic, or sodic chloro-platinate. The coating and developing solutions are applied as described in my former specifications, or by other suitable means.

Having now particularly described and ascertained the nature

of my said invention, and in what manner the same is to be performed, I wish it understood that I do not limit myself to the proportions above stated, nor do I limit myself to the use of aqueous solutions for the purposes of forming the coating, or sensitizing and developing solutions, as I may use any suitable solvent for the salts employed in my process, and I claim:—

First. The method or process of photo-chemical printing, wherein I modify or vary the process described in the specification of my said patent, No. 1681, by ensuring the presence or contact of a salt of lead or of mercury with the image during the development, and by avoiding the use of phosphates or other salt in which the ferrous image is insoluble, as and for the purpose herein set forth.

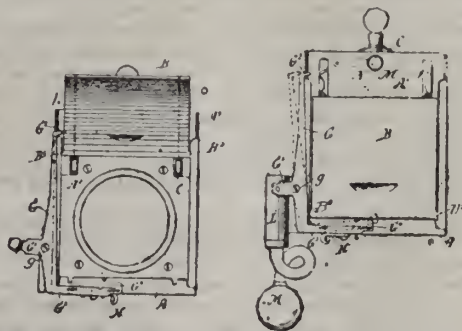
Second. The development of a photographic picture or image by a solution (which contains a salt of platinum, and which does not contain any phosphate) applied to a surface sensitized by the application of a solution containing ferric oxalate and a salt of lead, or of mercury, or both, as above set forth.

Third. The development of a photographic picture or image by a solution (which contains a salt of platinum, together with a salt of lead or of mercury, and which does not contain a phosphate) applied to a surface that has been sensitized by a solution containing ferric oxalate with or without a salt of lead or of mercury, as above set forth.

#### Patents Granted in America.

375 671. CHARLES DURNFORD, Edinburgh, County of Midlothian, Scotland, for "Photographic shutter."—Filed March 16, 1886. Serial No. 195,466. (No model.) Patented in England, Sept. 15, 1885, No. 10,896, and Dec. 22, 1885, No. 15,747.

Claim.—1. A shutter for cameras having a combined sliding and pivotal connection at its upper end with its support, where-



by it is adapted to rise and open as a flap, and descend and close as a slide, substantially as described.

2. The combination, with a photographic lens, of a frame carrying a single reversible shutter, operated by a tension spring, all substantially as herein set forth.

3. The combination, with the frame and reversible shutter with tension-spring, of the lever G, with catch G<sup>2</sup>, as and for the purposes described.

4. The combination, with the frame A and shutter B, of the lever G, with arm G<sup>2</sup> and catch G<sup>1</sup>, and stop H, all as and for the purposes described.

#### Correspondence.

##### THE OPTICAL LANTERN.

SIR,—So far as my inquiries have gone upon the above subject, it seems that leading points to which purchasers of three or more wick lanterns should pay attention are:

—1. That a little meniscus or other suitable lens shall be near the orifice of the lamp, to perhaps double the amount of light thrown into the ordinary condenser. 2. To see that all the cones of light passed through the slide shall enter the projection lenses by means of the back lens of the latter being of sufficient diameter. When the projection lenses are of short focus, they are more especially liable sometimes not to take in all the light they should pass on. Perhaps some of these points may come up at the discussion of the paper next Thursday night.

Special attention is drawn to oil lamps, because it is im-



probable that private families will use bottled oxygen to any great extent, especially when they live a few miles from the source of supply, for iron bottles are not of light weight, and all families are not scientific enough to care to handle oxygen. A good lantern will contain appliances for readily centring and holding the oil lamp in proper relation to the centres of the lenses.

The immediate object of this letter is to say that by some accident no author's proof reached me, and that in the second part of my paper Mr. Wilkie should have been described as a "typical," not as an "optical," representative of the lantern world; also that the name of "Dr. Cameron Reynolds" should have been "Dr. Emerson Reynolds." W. H. HARRISON.

#### DR. VOGEL ON ORTHOCHROMATIC PHOTOGRAPHY.

DEAR SIR,—I find in your valuable journal of January 13th a letter of Mr. Edwards, who mentions my name in connection with Mr. Bothamley's letter of December 23rd. Mr. Edwards opposes to my theory of optical sensitizer in reproducing Captain Abney's words:—"If the theory of optical sensitizers were correct, we should have to believe that a ray of some particular refrangibility which was absorbed by a dye was in its partial absorbed state capable of acting more vigorously on the salts of silver than the same ray totally unabsorbed could do."

Allow me to answer to this so-called objection that it proves by many experiments of Dr. Eder, Dr. Nasselberg, Dr. Lohse, Becquerel, and others, that really a ray absorbed by certain dyes in the presence of silver salts acts more vigorously on this salt than not absorbed rays.

This well-established fact, discovered at first by myself, it proves worth so many dyes, that the principle can not be killed by opposing phrases.

I have called these dyes, making sensitive salts of silver for the absorbed rays, optical sensitizer. I am sorry that this name is disliked by several gentlemen, but the name explicated real facts, and so I have the right to use it. In regard to Abney's theory of combination between the sensitizing dyes and free silver, I mention that only the so-called eosine dyes give such combinations, but none of the other dyes which are recognised as optical sensitizers.

Mr. Edwards asserts further in regard of my patent application for eoside of silver as optical sensitizer in the gelatino-bromide process, that this eoside of silver "has always been used in the Tailfer and Clayton process."

I beg to answer to this, that in the patent specification of Messrs. Tailfer and Clayton not a word is said over the application of a combination of silver with eosine dyes. Therefore, if the mentioned gentlemen have used it, as Mr. Edwards asserts, they have perhaps used it secretly, but they have not published it, and not included it in their claims.

The assertion of Messrs. Tailfer, Edwards, &c. (given in opposition to my patent), that eoside of silver were formed by adding eosine and ammonia to the emulsion "in the moment of formation," is untrue, because in the moment of formation of the bromide of silver in the emulsion an excess of soluble bromide is present, which destroys wholly the eoside of silver.—Very truly yours,

Berlin, Jan. 13.

DR. H. W. VOGEL.

#### TYLAR'S METAL DARK SLIDES.

SIR,—Noticing an illustration of the above in the *English Mechanic*, No. 1,189, I was struck with its resemblance to the one I described in the *PHOTOGRAPHIC NEWS* of January 10th, 1879; and on obtaining the patent specification I find it is practically the same article. The provisional specification says the invention consists of two shallow cases or trays . . . each having a sliding shutter. . . . The said cases or trays are capable of being affixed to each other by a sliding or other device, &c. And the complete specification claims the same with the addition

of a piece of cloth, &c., to exclude light, and two corners left on the shutters to prevent pulling right out. It then goes on to describe the groove all round, and a corresponding piece to drop therein (the same as mine), and also what is practically a hinge the same as mine, but with the hinge pins loose. The claims are:—

1. A means of making a light-tight groove. (But it does not say whether this is the groove for the shutter or not.)
2. A self-locking shutter.
3. A means of keeping the slide in position in the camera.
4. A method of fastening by wires inserted in tubes.

Now, sir, apart from the previous publication, which, of course, invalidates the patent to the extent so published, I believe it is invalid because the third claim is for something not disclosed or described fully in the specification, and it is an admitted principle in patent law that claiming too much invalidates the whole; but I submit that it is rather too bad for anyone to patent and claim as an exclusive possession what your pages have given to the public years ago.

The bit of cloth, &c., to exclude light, and the projections on the shutter for "self-locking," as it is termed, have, if I mistake not, been published or referred to over and over again in your columns and others many years since. I first used the latter plan on the slides I described, but discarded it, as one can do no good in windy weather with a shutter sticking out and flapping about beside the camera, and I think most people prefer those which withdraw entirely with a flap to cover the opening left, for which I use three plans (which, perhaps, I had better describe, or some one may patent and annex them also). One is a narrow strip of metal hinged under the outer case of the end of the slide, which gives way when the shutter is introduced. Another is a thicker strip sliding between two plates, forming a double end to the slide, and having a bevelled edge, so that the shutter can push it aside on entering by slipping down the bevelled edge. And the third is a thin narrow tube turning inside another tube soldered to the end of the slide, which, when in position for the shutter to enter, have slots through them for it to slide in, but when it is withdrawn the inner tube turns and closes. All three plans of course include the necessary springs for closing the slots.

I have no trade interests to look after, but I do not care to have any one patenting my inventions and preventing me and others from freely using them, hence I point it out. At the same time I prefer those I described, because Mr. Tylar's are as wide and as long as the old-fashioned wooden ones, while my latest made is only a trifle wider and longer than the plates used, and about five-sixteenths of an inch thick, using brass plate of B.W. gauge 40. These are, of course, without the tube rings to slip into the camera, as I originally described, being quite flat, and fitting to it with a slip of india-rubber all round to exclude light, and a spring behind to keep it in position.

RICHARD PARR.

#### VIEW FINDERS.

DEAR SIR,—Amongst the various view finders, it is astonishing that one never sees the old Claude Lorraine glass used by photographers, and yet it is one of the best, as you can easily select your view with it, and there fix it by any simple device on your camera.—Your truly,

WILLIAMS R. KENNAN.

7, Kenilworth Square, Rathmines, Dublin, 21st January.

#### DISTINCTION BETWEEN THE CELLERIER SYNDICATE AND THE PHOTOGRAPHIC COMPANY LIMITED.

SIR,—In your issue of last Saturday, you say a winding-up order was presented against the above company, which



is untrue. Please rectify this error without delay. The Photographic Company, Limited, have now completed the purchase of the English patents Cellier-Parkes process, and are prepared to undertake the execution of orders.

As to the proceedings before the Court, the facts are these:—A petition was presented by one of the smallest shareholders against the Cellier-Parkes Syndicate, which Mr. Justice Kay dismissed with costs.—I am, Sir, yours obediently,  
VERNON HEATH.

58, Pall Mall, January 23rd.

### A PLATINOTYPE PATENT.

DEAR SIR,—While looking through vol. xxix. of the NEWS, I caught my eye on what to me looks like the same process as that just patented by Mr. W. Willis as his latest improved platinum process. At page 345 you will find a paper on "Alkaline Development" by Captain W. de W. Abney; at fifth line from bottom you will read the following:—"If the ferric oxalate be sponged on paper, and dried and exposed, and then treated with a solution of warm potassium oxalate mixed with which is a platinum salt, metallic platinum is deposited by the reducing action of the light-produced ferrous oxalate in presence of potassium oxalate." Mr W. Willis, in his specification says, "Hitherto, no means have been known by which the salts of platinum could be employed entirely in developers or developing solution." This seems to me a great mistake, as we see it was published in May, 1885.—Yours truly,  
J. STEAPE.

## Proceedings of Societies.

### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE usual technical meeting of this Society was held on Tuesday, the 24th inst., W. ENGLAND, vice-president, in the chair.

FRIESE GREEN produced, as a matter of interest to the members, a quantity of early photographic literature and productions. Amongst the latter were many examples of Fox-Talbot's *Pencil of Nature*, some of the prints in which were in very good condition, whilst others had almost entirely faded. In an early number of the Society's Journal attention was particularly directed to a print accompanying the issue for Aug. 16, 1859, and described as being by "Pretsch's patent process." This print was considered to be superior to the greater part of the more recent productions in which the aim was similar.

G. L. ADDENBROOKE noticed in the Journal of March 21, 1857, a statement that a number of photographs had been presented to the Society by Prince Albert, and enquired of the Secretary whether those photographs were still in the possession of the Society, a question to which a reply in the negative was given.

A. MACKIE said that in the Journal in the early days he found reports of other Societies' meetings, and considered that it was then more representative than it had since become.

SEBASTIAN DAVIS said that at the last meeting reference had been made to the subject of marking lantern slides in a uniform manner. He understood that the proposal was to place two white spots on the top front corners of the slides, the demonstrator understanding that the spots were placed at the bottom and next the light of the lantern. He found that many makers issued slides the mount of which was white in the front. With these, of which he showed several examples, he had used black spots of paper to mark them.

A. COWAN said that the Photographic Club's recommendation was to use either the two spots as mentioned, or a white line running from where one spot would be situated to where the other would be.

W. BEDFORD, said that the plan which he mentioned at the previous meeting did not originate with him. Some years ago a committee was appointed by the Photographic Club to settle upon a uniform system of marking, for slides shown in their lantern. The committee fixed upon two white spots, one in each top corner, or a white line joining those corners, and on the side of the slide to be next the light. The system had been adopted by many outside the Photographic Club. If the

Society he was now addressing gave the weight of its authority to the system, it would be a good thing.

THE CHAIRMAN thought that a line drawn in white paint would be simpler than sticking on paper.

O. SMITH thought that the standard was already pretty generally adopted. He had recently bought some slides in the North of England, and found them marked with the two white spots in the places directed.

MR. FRESHWATER said that it was very advantageous that the makers of slides should mark them in accordance with some recognised standard. In many slides that he had bought it was difficult to know which was the bottom and which was the side.

W. BEDFORD, in order that some practical result might be attained, moved "That in the opinion of this meeting the Photographic Club system of marking lantern slides should be adopted and recommended by the Photographic Society of Great Britain." The motion was seconded by the Hon. Secretary, W. F. DOUKIN, and carried unanimously.

T. S. DAVIS said that with some slides, particularly natural history subjects, it was often desirable that the disc should not be large, not larger than four feet or four feet six inches. For this size the illumination to be got with oil lanterns was very satisfactory. Then the question arose, What is the best method of using oil? The most popular was the use of a lantern with three or four wicks, and of the sciopticon pattern; that is to say, a lantern with a metal body and glass disc to replace the glass chimney otherwise required. There were, however, generally present, with this form, dark lines which were easily recognised upon the screen when a plain circle of light without a subject was thrown upon it. To remedy this an arrangement of wicks in the form of the letter W had been used, but he had not found it satisfactory. It was desirable that the whole of the flame from one wick should play upon the whole of the flame from the next wick. He had also an inclination of the wicks to the side of the lantern whilst keeping them parallel to each other. This was so far good, but there was a smell created with lanterns of this form which was objectionable, and to avoid it he had used a circular wick with a glass chimney. There was also the optical advantage about a glass chimney in the fact that it could be narrowed at a certain place, and so cause a concentration of light where wanted—opposite the centre of the condenser. He had used with advantage a lamp of Birmingham manufacture, in which the circular wick was formed in two halves. The next point was, What was the relative advantage of paraffine and of almond oil? Here he found that almond oil—which he used in preference to other fat oils because it did not congeal or harden—gave a whiter light and more intensity than kerosine. Owing to this characteristic, it brought out more detail in dense subjects than kerosine would. A few days since, he had used a patent incandescent gas burner in Dr. Crooke's laboratory. He found it useful for microscopic subjects, but the practical intensity of the light was certainly very inferior to that which could be obtained from the best form of lantern with almond oil or kerosine, and for this reason: The incandescent lamp gave a large illuminating surface, but with the lantern it was only the centre of the surface that could be made use of.

O. SMITH said that he entirely disagreed from T. S. Davis' reason for having smell from lanterns of the sciopticon form, and not from those with glass chimneys. He believed that it was merely a question of keeping the outside of the lamp free from spill paraffin, and this was commonly easier to be done with argand burners than others, but it was merely a question of care in use. He also thought that Mr. Davis would find that he could not get more light with four flat wicks than with three.

T. S. DAVIS assented to the last proposition.

J. FOX SHEW enquired whether T. S. DAVIS had tried coconut oil in comparison with almond oil?

T. S. DAVIS had not done so, as it was less fluid, but would make the comparative experiment suggested.

J. R. GOTZ used a three-wick lantern without getting a dark streak. He had a lamp which would bear out his statement. Air was admitted between the flames.

THE CHAIRMAN showed some lantern slides printed on rapid gelatino-chloride plates, having about the same rapidity as wet collodion, and resembling the results from the latter in colour. The developer was the ordinary ferrous oxalate.

THE HON. SECRETARY announced that the next meeting to be held would be the annual one on February 14th, when the discussion on "Stereoscopic Pictures" would be resumed. The following meeting would be the technical one of February 28th,



when Howard Farmer would read a paper on a new process for printing by development upon ordinary albumen paper. On March 13th J. R. Dallmeyer would have a paper on "Depth of Focus in Photographic Lenses."

#### PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

The Committee of this Association met at 181, Aldersgate Street, on the 18th inst.

The minutes of the previous meeting having been confirmed, Miss A. R. Graham and Mr. A. J. Penny were elected members of the Association.

The following were appointed Hon. Local Secretaries:—T. Protheroe, 36, Wine Street, Bristol; H. W. Bibbs, 27, Myrtle Terrace, Slateford Road, Edinburgh; W. M. Ashman, 20, John William Street, Huddersfield.

Correspondence was read showing that some assistants required re-engagements, and employers required assistants. It was decided to insert an advertisement in the *Photographic News* and *British Journal*.

The SECRETARY then submitted the balance sheet for 1887 with his report, which the Committee accepted. It was decided that the same be printed, and issued to the members when convening annual general meeting, which will be held at the above address on Feb. 24th; chair to be taken at 8 p.m.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The ordinary weekly meeting was held on the 19th inst., F. P. CEMBRANO in the chair.

A simple and at the same time an ingenious apparatus for flashing magnesium powder was shown by H. M. Hastings. A glass tube 6 inches long, to one end of which a pneumatic ball and tube is attached, holds the charge of powder, the opposite end being left open. The tube is held horizontally, and the powder inserted through a small glass funnel let into the tube about midway. Attached to the open end or the tube, and in direct line with it, a small length of asbestos, covered with wire gauze and dipped in methylated spirit, provides the flame. The apparatus is now held at arm's length, with the thumb placed over the top of the glass funnel; the ball being pressed by the other hand, the powder is forced through the spirit flame, the method of firing being similar to the firing of a pistol.

F. W. HART exhibited his perfected apparatus referred to last week, and fired several charges with it to show its action.

Negatives and prints were passed round by F. A. BRIDGE, of the groups taken the previous week by him with the flashing light.

The CHAIRMAN said he had successfully used oxygen in conjunction with magnesium powder. He handed round some prints from negatives taken with only two grains of magnesium powder, using a white reflector.

W. H. PRESTWICH read an extract from a periodical on the "Transparency of a Certain Japanese Paper." The paper referred to is said to be manufactured from an aquatic plant indigenous to Japan, its principal feature being its remarkable transparency, in addition to great strength and tenacity, forming an excellent substitute for glass.

F. A. BRIDGE exhibited two printing frames of different design for printing opals. In one a corner of the frame was cut away; after the insertion of the negative and opal, the loose corner was fitted into its place, a small thumbscrew in the same forcing the negative and opal against the opposite sides of the printing frame for register. The principle in the second frame was the same, but was acted upon from the centre of one of the longest sides also by a thumbscrew. These two frames had passed into the possession of the exhibitor, with other pieces of photographic apparatus, some fifteen years since, but he had not tested them for efficiency.

W. H. PRESTWICH showed a printing frame for the same purpose. This, he said, had only been finished that day; he was therefore unable to speak of it practically. This frame in some respects was similar to one of the two just shown by F. A. Bridge, in having a movable corner, a brass spring in this case supplying the pressure to the opal to keep it in register. Two screws regulate the pressure springs at the back of the frame, thereby admitting of any thickness of plate being used.

W. H. PRESTWICH also handed round a bromide print, printed out, and toned with gold. He claimed that the paper was from four to five times quicker than ordinary albumenised paper.

J. B. B. WELLINGTON gave a method he had adopted of in-

tensifying a collodio-bromide enlarged 15 by 12 negative that was found too thin to print from after it had been varnished. It was first flooded with methylated spirit, then washed, and afterwards immersed in a bath of ammonia and water; after rinsing under the tap the plate was ready for intensification, Howard Farmer's formula being employed.

A. P. HIGGINS drew attention to the last volume of Burton's Book on "Photographic and Photo-mechanical Printing," just published; also to a recent volume of Amateur Work; these he laid on the table for inspection.

Referring to the manipulation of the flashing light, J. TRAILL TAYLOR said he had recently seen a cupboard or large box used for the purpose, the bottom of which was covered with a metal plate, and having an aperture at the top; the mixed powder was placed on a piece of touch-paper at the bottom, and ignited by burning the paper. To prevent the sudden flash dazzling the sitter, a sheet of tissue paper was interposed between the sitter and the light.

The CHAIRMAN asked if any of the members had succeeded with Pizzighelli's platinum process; he had not done so, owing to the difficulty experienced in obtaining sodium ferri-oxalate.

W. H. HARRISON said this could be obtained by dissolving crystals of binoxalate of soda in freshly precipitated ferric oxide.

W. Dallyn, A. J. Penny, and W. Taverner were elected members of the Association.

#### NORTH SURREY PHOTOGRAPHIC SOCIETY.

The usual fortnightly meeting of this Society was held at the West Norwood Constitutional Club on Tuesday evening, January 17th, W. H. WALKER in the chair.

Messrs. Momas, Fladder, and Bridgewater were elected members of the Society, and proposals were read in favour of Messrs. Rouch, Dowson, and Greener.

There was a full attendance of members, the evening being devoted to a lecture on "Detective Cameras" by A. R. Dresser, and an exhibition of lantern slides prepared from negatives taken in his detective camera, and also a series of instantaneous studies of animals at the Zoo.

Mr. DRESSER, after describing his camera, pointed out that in his opinion the lens for a detective camera must be of a wide angle, and must work at  $f/16$ . The lens which Mr. Dresser had found most suitable, and which he used, was euryscope, working at  $f/16$ , and which, from the results shown, had a remarkable depth of focus. In one picture, shown on the screen, and taken with this lens, a man within six feet of the camera was fully exposed and in sharp focus; while an object some miles in the background was plainly discernible. The most remarkable thing about these detective camera shots was the fact that most of them were taken during dull weather in November, and on Eastman stripping films, which, in Mr. Dresser's hands, have proved fast enough for all classes of instantaneous work. The series of 100 slides which Mr. Dresser put through the lantern were exceedingly good, the "Zoo" series including many specimens of instantaneous studies of animals, which are quite unique. In fact the whole exhibit was a great success, and much appreciated by a large audience.

Mr. SENIER showed a fixed focus hand apparatus, by Messrs. Shew and Co., and also a series of lantern slides from negatives taken in that apparatus.

#### NORTH LONDON PHOTOGRAPHIC SOCIETY.

An ordinary meeting was held on January 17, J. TRAILL TAYLOR in the chair.

F. W. HART exhibited and explained his new magnesium lamp, a development of that exhibited by Mr. Bishop at the last meeting. Several important improvements had been made, and he believed that the lamp would now be found a most useful article.

The PRESIDENT described an apparatus for burning a magnesium compound which he had seen in use in a West End studio. It consisted of a closed cabinet, provided with a suitable receptacle for the powder, which was ignited by a slip of touch-paper. After the exposure, the cabinet was carried out of doors and the smoke allowed to escape.

J. OAKLEY thought Mr. Hart's lamp would be useful for supplementing daylight in taking interiors.

The discussion of the evening on "Toning and Fixing" was opened by A. MACKIE, who said that though the subject was constantly before all the photographic societies, no important change in the process had taken place since the first introduction



of the alkaline gold toning process, more than a quarter of a century ago. Most photographers had their pet formula for a toning bath, and he must confess that he had at different times had a weakness for each of the recognised methods. On looking over a lot of old prints, however, the tone was found so uniform that he could not now distinguish between those toned in acetate or borax, tungstate or carbonate baths. He was, therefore, led to believe that there was very little variation in colour caused by the salt added to the toning bath, but rather by the state of "ripeness" the bath had attained when it was used. The more alkaline the salt used in conjunction with the gold, the quicker the bath was ready for work; and he maintained that, given a certain stage of ripeness, all baths would tone the same colour. Referring to fixing, he said that whereas hyposulphite of soda was the great bugbear of the photographer, he believed it to be comparatively harmless in a properly fixed print. There was, however, a much more injurious compound formed in the process of fixing which would work the ruin of the print if not removed. This was the hyposulphite of silver, the product first formed on the immersion of the print in the fixing bath. If the bath had become weak or the immersion in the hypo had been too brief, this was not dissolved, and no amount of washing with water could remove it.

Mr. GROUNDWATER asked if there was any means of telling when the hypo was thoroughly removed from the print.

Mr. MACKIE suggested the use of iodide of starch.

L. MEDLAND said that permanganate of potash added to the washing water would show if hyposulphite was present.

The PRESIDENT said that some years ago Mr. F. W. Hart had introduced a hypo eliminator composed, he believed, of hypochlorite of soda: would he give details?

Mr. HART said he would be happy to do so, with experiments, at a later meeting. He also advocated the washing of prints to be done with a definite quantity of water in relation to each sheet of paper treated, and after washing using a definite quantity of toning and fixing bath for each sheet. In his own practice he used one pint of water to every sheet of paper printed for each of the preliminary washings, followed by one pint each of toning bath and hypo. This last he used of the strength of two ounces to the pint.

The meeting was then adjourned till February 7th, when Mr. Medland will deliver a discourse on his recent trip in Northern Europe, illustrated with a number of lantern slides from negatives taken *en route*. Visitors are cordially invited. On this occasion ladies will be admitted.

#### CAMERA CLUB.

On Thursday, January 19th, Captain ABNEY read a paper on "Winter Photography in the Alps." F. MACHELL SMITH occupied the chair. The lecture was illustrated throughout by pictures shown on the screen by the optical lantern, and treated chiefly of photographing snow scenes. Amongst the slides shown was one representing a view taken by moonlight with an exposure of one hour. Some interesting details of Captain Abney's practice in photographing, in development, &c., were given, and the after discussion was taken part in by Messrs. Lucas, Lyonel Clark, Ferrero, Plomer Rodgers, and the Hon. Secretaries.

The subject for Thursday, February 2nd, is "Photographing by Artificial Light," to be introduced by J. F. ROBERTS. Meeting at 8 p.m.

#### EDINBURGH PHOTOGRAPHIC SOCIETY.

The third meeting of current session was held in the Professional Hall, 20, George Street, on Wednesday evening, 11th January, at 8 p.m., the PRESIDENT in the chair.

The minutes of last ordinary meeting being read and passed, five gentlemen were duly elected by ballot to the membership; five names were submitted for election in February.

Mr. J. M. TURNBULL exhibited Stirn's patent vest detective camera, and explained its use. Some prints from negatives made by the camera were handed round.

Mr. FORGAN exhibited a rectilinear lens by Wray, which had been fitted with an iris diaphragm, being the first one of the kind turned out by this maker. Attention was called to the ease and convenience of touch which characterised it, and which made it quite apparent that this is the diaphragm of the future; ways in place and under the most perfect control either to contract or enlarge, without the trouble of changing, and with no cut in the mount through which light may be admitted to the plate. It is not claimed that this is a new application of

this diaphragm, but each maker who adopts it ought to be commended for the step, because it is a real advance and a great reduction in itself of one of the smaller troubles connected with the use of photographic appliances.

Mr. W. CROOKE exhibited a transparency made from a negative of a group taken in an ordinary room by means of artificial light. It was the third of three exposures made, the time being four or five seconds, the others being much overtimed. The illuminating agent employed was gun-cotton sprinkled with magnesium powder, the result being a very fair negative. The transparency was put through the lantern and favourably commented upon.

After which Mr. Forgan introduced Mr. L. Mack, who proceeded to give a lecture, which he entitled "A Trip to the Midnight Sun." For, he remarked, it was principally to behold this strange sight that Mr. Stitt and he visited Norway on this particular occasion. Mr. Mack explained that with the exception of two, the whole of the photographs were the work of Mr. Stitt. The lecturer then described the pictures as thrown upon the screen, and which were representative of towns, harbours, landscapes, and marine views, extending over a large portion of the country, from Bergen to the North Cape.

The views were generally of very fair quality, and, in some instances, all that could be wished. The pictures of black ice glaciers were very striking, and two slides of the midnight sun were viewed by the audience with unusual interest.

A hearty vote of thanks was moved by Mr. Forgan to Mr. Mack and Mr. Stitt, and a desire expressed that the society should be favoured at some future time with another exhibition of their work.

W. CROOKE moved thanks to Mr. G. M. Wilson for the admirable manner in which he had put the work upon the screen. The lighting had been admirable, and the dissolving feature of his lantern pleasingly manipulated.

Mr. WILSON, while expressing thanks, exhibited a convex mirror (the suggestion of the secretary), which he proposed to mount on a swivel stand for the purpose of enabling lecturers on such occasions to be relieved from the necessity of always turning round to see what was upon the screen, and the consequent inconvenience of speaking with the back turned to the audience. The mirror being set at the proper angle in front of the speaker reflected the whole screen, and made him aware of the changes made without interruption or discomfort.

Professor Burton's new work on "Photographic Printing Processes" was laid upon the table from Messrs. Marion and Co., also Wilson's "Photographic Mosaics" from the Editor, New York.

#### MANCHESTER PHOTOGRAPHIC SOCIETY.

The usual monthly meeting was held on December 12th, ALAN GARNETT in the chair.

W. L. Spence, Charles Estcourt, L. E. Clift, James Parkin, and E. L. Bond, were duly elected members.

J. G. JONES exhibited a new reducing valve made by A. Clark-son, for regulating the pressure of compressed oxygen.

THOMAS CHILTON exhibited a number of stereoscopic slides; these were silver prints made on albumenised paper mounted in optical contact with glass. Two of these slides were bound together back to back; on the face of each glass was fixed a dome or cushion-shaped mask. Mr. Chilton described the method he had adopted in attaching the prints to the glass, which was by gelatine, and replied to several questions of detail.

HENRY SMITH said he had successfully mounted albumenised paper prints in optical contact with glass, without any adhesive material except the albumen on the surface of the paper.

The Hon. SECRETARY (W. I. Chadwick) exhibited a defective negative which had been given to him by a dry plate maker in London. It was covered with transparent spots, some measuring quite an eighth of an inch across. They were not all round spots, and varied in size and shape. He had formed his opinion of the cause of these defects, but would like to have the opinion of the meeting. (He, however, afterwards stated they were caused by air-bubbles under the developer.)

W. BLAKELEY recognised the negative as one he had exposed and developed, and one of three he had returned to the plate maker as a sample of bad plates. He said he did not think air-bubbles were the cause of the defects, for he had brushed the plates when under the developer; he was inclined to think the defect was due to the manufacture; for instance, air in the emulsion—perhaps the tail end of a batch.



Mr. WHITEFIELD said he had had sad experience with the same make of plates, and for his part he was sure it was not air-bubbles when developing, for he had allowed the full pressure of the town's water supply to play on the plate before developing, and if seventy pounds per square inch would not remove air-bubbles, what would? So serious was the defect in his case that after a holiday tour almost every plate developed the same way, until at last he examined the plates as he took them from his dark slides, and was understood to say that on one quarter-plate he counted as many as one hundred and three defective places, which when developed and fixed turned out to be one hundred and three transparent spots.

J. S. POLLITT said he had used the same make of plate for a long time; he was troubled with these spots at first, but since he took to brushing them with a soft camel-hair brush when under the developer he had had no further trouble, and could speak very highly of the general quality of these plates.

JOHN SCHOFIELD said the method adopted by Mr. Whitefield of allowing a great pressure of water to dash on the plate would be likely to cause air-bubbles. He had experienced very similar defects when using newly made plates, but it disappeared on keeping the plates some few weeks.

S. D. McKELLEN gave his experience with various makes of plates, advocating the brushing when in the developer.

The CHAIRMAN said it was quite impossible to come to any definite solution of the difficulty; he, however, thought they were air-bubbles.

Mr. BENSON said he had been troubled with very fine transparent spots in Eastman paper.

The CHAIRMAN said he had used Eastman paper for a considerable time, and had never such experience.

The HON. SECRETARY suggested these pinhole spots might be caused by dust getting in the roller-slide.

Mr. BENSON asked what strength hypo solution should be made up for fixing silver prints; one book told him four ounces to a pint of water, and another authority stated about half that strength.

Several members replied four ounces to a pint of water was about right.

Mr. McKELLEN gave some recent experiences of toning and fixing in one solution, and advocated this method as very convenient and suitable for amateurs who had only a few prints to tone occasionally, and would like the experience of others, say, as to their permanence.

Mr. POLLITT said he had used this method thirty years ago, and had prints now that, with the exception of a slight discoloration in the whites, which took place during the first five years after they were made, were by no means bad.

Mr. SCHOFIELD gave his experience of toning paper prints when the first washing was done in hard or soft water. With the hard water it was a slow process, and very difficult; soft water was much the best.

#### SUTTON SCIENTIFIC SOCIETY.

THE Photographic Sub-committee of the above Society held a small but interesting exhibition in connection with the Society's *conversations* and exhibition at the Public Hall, Sutton, on the 17th and 18th inst.

Among the members' work shown was the frame of out-door views by A. W. Bawtree, which carried off the annual prize for the best set of views by a member; these were printed in platinum, and, though small, showed considerable taste and ability.

H. E. Murchison took the prize for the best print shown by a member, with a beautiful platinotype showing an ancient fireplace in an old Welsh mansion. In arrangement, lighting, and photographic skill, his picture was unanimously considered by the judges (Messrs Payne Jennings, Cadett, and Corbould, R.I.) and all who saw it, a perfect gem. The slide from the same subject was also fine. Mr. Cathcart sent three enlargements from snow scenes which were very well rendered; and there were many excellent pictures lent by members and friends.

Sands and Hunter, Hinton, Park, Dewey, Thornton, and the Stereoscopic Co., were among the exhibitors of novelties in apparatus.

On both evenings slides were shown by the optical lantern, which added much to the enjoyment of the visitors, who specially appreciated the series of magnificent views of Windsor Castle by W. Brooks, kindly lent by C. Hussey.

## Talk in the Studio.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—The annual dinner will take place on Feb. 2nd. Members intending to be present are requested to communicate with the Hon. Sec., 128, Southark St., S.E., not later than the 1st prox.

PHOTOGRAPHIC CLUB.—The subject for discussion on Feb. 1 will be on "Keraunography." A short paper will be read by Mr. Davis.

BROWN SPOTS ON GELATINE NEGATIVES.—Experience teaches us that when the alum solution used as a bath for clearing negative prints before fixing is not in sufficient quantity in the dish to cover completely the plate, often brown spots show themselves on the gelatine negatives. It is wrong to suppose that these spots are produced from insufficient fixing, inasmuch as the portions that remain brown are those which have not been in contact with the alum solution, and none of the portions of the plate that had been covered by the solution show similar spots.—*Photo. Rundschau. Translated in the Philadelphia Photographer.*

## To Correspondents.

Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C." while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

WILLIAM R. KENNAN.—We do not think that the Company in question has any legal right whatever to control the process referred to; and as far as we know, there is no patent covering it.

JOHN E. FALKNER.—We will post you a few continental photographic papers, from the advertisement columns of which you will doubtless be able to obtain most of the addresses you require.

AN AMATEUR.—The best method we know of is the Plener method with hydrofluoric acid.

H. BRENCHEL.—The letter has been forwarded.

W. E. W.—Write to Marion and Co., and ask them if they know of anything.

COL BIGGS.—You did not give your address, and we could only answer you in this column. We are much obliged, and will write.

Q. G.—1 and 2. Any well-made paper of moderately good stuff will answer the purpose. A double-crown weighing 31 lbs., and sold by Spalding and Hodge, of Drury Lane, at 10s. 6d., is quite suitable, but for experimental purposes you may very well use the more expensive Rive's or Saxe papers. 3. We consider them quite as permanent. 4. We have not tried the lens in question, so can give no opinion. Ask the maker to let you have it on trial, a thing he will be quite willing to do if he is satisfied it is of good quality.

J. D.—The letter has been sent on to D. C. Dallas.

G. and W. MORGAN.—Send us the matter in the form of a letter, and we will insert it.

COLLOTYPE.—For experimental purposes, as regards the production of the tint you require, you can very well mix the ordinary tube oil colours, and use the result as a printing ink. The only inconveniences are that the tube colours are often inconveniently thin, and they dry so quickly as to give a little trouble in working. Still there is this advantage, that they can be obtained almost anywhere, and by obtaining colours of a well known maker such as Rowney or Winsor and Newton, one can obtain the same article time after time.

NITRATE.—Use less alcohol; half or even one-third will probably be sufficient.

DELIGHTED.—We consider it simply detestable from each one of the three points of view, and if your friend the constructor likes to send a copy for review, we will have great pleasure in giving the reasons for our opinion.

M. T. C.—1. Next week, if practicable. 2. Yes. 3. Try again, using ferricyanide, not ferrocyanide.

P. L. T.—We will insert your letter if you authorise us to attach your name to it.

F. HOLMES.—Several have appeared in the News during the past few years.

A. H. CADE.—1. There is a list in the YEAR-BOOK, and they can be obtained from Trubner, of Ludgate Hill, London. 2. The new school in Vienna will be likely to suit you best. See article on p. 823 of volume xxxi.

SYDNEY PORTER.—The only thing we can suggest is soaking them in weak cyanide of potassium solution, but there is a considerable probability of this spoiling them.



# THE PHOTOGRAPHIC NEWS.



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## STANDARDS.

IN dealing with those qualities that cannot be described in absolute terms it is necessary to have a standard of comparison if any degree of exactness is to be attained. For commercial purposes we must have standards of weight and length, but these are now well understood, and are satisfactorily represented in everyday life.

The total absence of light is a condition which can perhaps be brought about, but the perfection of light cannot be thought of; the human mind cannot grasp the idea of an unsurpassable brightness. It is necessary, therefore, to have a standard of luminosity if light is to be in any sense measured, and the standard practically adopted in this country for commercial illuminants is a sperm candle burning at the rate of 120 grains per hour. This standard is useful for the purpose for which it is employed, though, doubtless, it would be possible now to suggest a far more uniform light. Two or three methods, at least, have been definitely worked out in which a pure chemical compound is burned from a burner of fixed size with a wick regulated to give a flame of uniform height. Working on such principles it is possible to get a standard of luminosity that changes to only a moderate extent, and that can be reproduced with facility.

But the chief use of a standard light to the photographer is for testing the sensitiveness of his materials, and when a very perfect standard of visible light is devised, the question still remains whether it is useful as a standard of photographic activity. It is very well known that actinic effect and luminosity are very far from proportional, and, indeed, that actinic effect itself varies very much with different preparations and varying sources of light. The difference between gas-light and daylight in the use of gelatino-bromide plates is a mere nothing compared with the difference they exhibit in their action upon the ordinary sensitive albumenized paper. A light-standard suitable for universal application by the photographer should emit all those sorts of light (or light of all those degrees of refrangibility) that produce photographic effect, with a sensible equality of intensity.

But if such a perfect standard were discovered, though it would enable an estimation of what we may call the absolute sensitiveness of photographic material with exactness, its use to the photographer would be very limited so far as getting a key to the practical sensitiveness under the varying conditions that exposures have to be made. It is easy to imagine two plates equally sensitive to this ideal standard, but the sensitiveness of one being chiefly to violet and the ultra-violet, and the sensitiveness of the other chiefly to the green and blue. When used in clear daylight the rapidity of two such plates might be practically equal, but on a misty day, when the ultra-violet was absorbed before it reached

the earth, and the violet itself was very much weakened, the second plate would be considerably more sensitive than the first.

It is well known that the rapidity of plates, as indicated by the sensitometer, is not an exact measure of their practical sensitiveness. It is doubtless a good measure of sensitiveness to the particular light emitted by the luminous tablet, and would be an exact key to exposure in contact printing when a similar tablet was employed for the purpose. But we can go even further than this, and throw doubt upon the comparative test "in the camera;" because such a test made, now on a clear day, and then on a misty day, would give a different comparative result if the plates used had their sensitiveness variously proportioned. This difference between plates is quite marked in comparing a bromide film with a brom-iodide film, and more so when an ordinary and an orthochromatic plate are tested.

Thus, so long as the light that has to be used in practical work varies, an absolute test of sensitiveness would appear to be more of scientific interest than of practical utility, and we must continue to employ our imperfect methods of making tests of sensitiveness, bearing in mind that the results are strictly comparative only under identically the same conditions.

## FAULTY PLATES.

BY C. BRANGWIN BARNES.

NOTWITHSTANDING the general good quality and reliability of most brands of commercial dry plates in the market, it would seem from the complaints of Mr. Fred. Palmer and others, that occasionally faults, and in many instances grave ones, are met with. Mr. Palmer states that certain valuable negatives not only bubbled or blistered, but the films came bodily off the glass. The plates in question were of foreign manufacture, though supplied through a London agent, and it may be some satisfaction to Mr. Palmer to know that he has not been the only victim. Some nine months ago I was using a foreign brand of plate, which gave very good results for a time; then came a batch which, on development, showed more spots than picture: the spots in question were transparent, with a small opaque centre. Having noticed the same kind of spots in plates of home manufacture, though in a much less marked degree, I made them the subject of a few experiments, which conclusively proved to me that they were not caused by any oversight or carelessness in dusting the plate or in development. I then submitted one or two to a chemical expert, who pronounced them to be caused by minute portions of organic matter in the emulsion itself. This organic matter, on further investigation, turned out to be bronze powder from the lettering



the paper in which the gelatine had been originally acked. The remainder of the batch were promptly returned to the agent, who disclaimed all responsibility, but exchanged the plates for fresh ones, which had fewer spots, but which, notwithstanding a strong alum bath prior to fixation, would persistently blister to an almost unlimited extent, either in the fixing bath itself, or in the after washing.

The cause of this blistering I was unable to discover, but finally concluded that it was better to discard that brand of plates altogether. It must not, however, be imagined that English-made plates are free from faults, though I am of opinion that if photographers were, through the medium of the NEWS, to state what faults they find in the plates they use, and to suggest remedies for the same, our home manufacturers would read, learn, and inwardly digest what was written, and would do their utmost to remedy the defects. For instance, many plates are spoiled through a band or line of greater or less width which often appears on each side of the picture, in some cases necessitating the same being cut of a smaller size than required. This band or line of insensitiveness is caused by the strip of bibulous paper inserted between the plates to keep the faces from contact, such bibulous paper being far from chemically pure.

Again, I have known instances where the finished negative has shown a transparent line of irregular shape and size in the centre of the plate, either utterly ruining the same, or necessitating a considerable loss of time in re-touching. This defect, I am assured by a maker, is caused by two plates coming into contact before one or both are thoroughly dry. Where the plates have touched, the developer refuses to act, and the transparent mark is the result.

A great many plates are wasted every year and every month from careless cutting, some being a trifle too small and falling through the carrier, others being a trifle too large to fit the carrier at all.

#### A SQUARE OF THE DISTANCE CHEMICAL PHOTOMETER.

BY D. WINSTANLEY.

IN the PHOTOGRAPHIC NEWS of Nov. 11 last (p. 709), I described a certain rotary photometer which I have devised and used successfully for the production of those graduated strips or "ladders of tints" which form the foundation stone, as it were, of quantitative photography. As I stated in my article, I left that particular instrument behind me when I came away from Paris in 1879. Being now, however, in want of photometrical appliances for further experiments, I have constructed another rotary actinometer, differing somewhat from the one alluded to, and described it in this journal on Jan. 20; and I have also devised and constructed certain other forms of strip-producing instruments, which, in the order of their evolution, I will describe, and the performances of which, after their description, I will compare.

Several years ago—in or about 1872, I think—I described in one of the journals of photography the simplest form of strip-producing apparatus which has been devised, and perhaps the simplest form which is "devisable." It consisted merely of a box with a hole in the lid as seen in fig. 1. Supposing this box to be placed under a sky of fairly equal illumination, it will be seen that the amount of light falling upon any portion of the bottom will be greatest immediately beneath the hole, and will diminish as the distance from the hole increases. There are three causes which obviously come into operation to effect this diminution. It diminishes because the angular magnitude of the hole diminishes in consequence of distance; it diminishes because the angular magnitude of the hole diminishes in consequence of its obliquity and in spite of

distance; and it diminishes because the surface receiving the light becomes oblique to the pencil of rays as we travel to the left of the position B, and more and more oblique as we more and more approach the position C. The problem how much light will fall upon a given point  $x$  be-

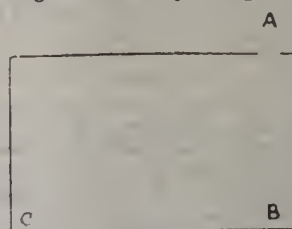


fig 1

tween B and C, is not very easy of solution, and becomes more difficult when white tissue paper is used over the hole A to equalise the source of illumination.

At the time I described the instrument I also gave my solution of this problem, and diagrams showing how I had arrived at it by means of plane geometry. Some years later, however (in 1874 or 1875), I raised this question in the columns of a contemporary journal, the *English Mechanic*, and did so under an anonymous signature, that of "Vulcan," if I remember rightly. The treatment of my questions was somewhat curious. "A Fellow of the Royal Astronomical Society," unconscious that he was dealing with the problem of another of its Fellows, described my question as one which could readily be answered by "the nearest school boy," who would tell me, he said, that the amount of light would vary inversely as the square of the distance of the point  $x$  from the hole A. Mr. R. A. Proctor, however, described the exact solution of the problem as impossible, but said an approximate solution could be obtained by means of spherical trigonometry, and this approximate solution he then gave in conjunction with a complicated diagram and a cloud of symbols. This solution, however, was shown to be erroneous, and a short controversy ensued, which terminated in an agreement that the solution I had originally given, and which had been ridiculed as absurd, was after all correct. That solution is, that the amount of light falling upon any point  $x$  between Band C, is less than the amount falling upon B, as the distance AB is less than the distance Ax, and that if the amount of light falling upon B be unity, that falling upon  $x$  will be  $\text{unity} \times \frac{AB}{Ax}$ . I am not, however, absolutely certain that this is right. Mathematicians are remarkable for their blundering, and I take it that an ounce of experimental knowledge is worth a ton of mathematic formulae, and to the experimental solution of this problem I shall presently devote myself. Meanwhile, assuming the solution I have given to be correct, I may say that the strips produced by the instrument have a certain, and for special purposes a con-

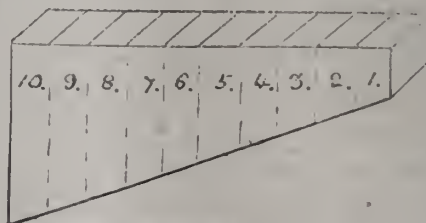


fig 2

siderable importance, but the changes in value of the tints obtained are decidedly too abrupt for ordinary purposes.

My latest instrument consists of a number of rectangular cells, alike in the sizes of the squares which form



their superior sections, and alike in the sizes of the parallelograms which form their inferior ones, but differing in their lengths. These cells, ten in number, are arranged side by side in the order of their lengths, and form a sort of truncated triangle as seen in fig. 2. A piece of white tissue paper is stretched, and fixed over the holes which form the upper surface of the instrument, and along the lower and longer surface, the hypotenuse of the triangle standard sensitive paper is secured. The whole is then exposed to light long enough to produce a tint in No. 10, the deepest of the cells. The theory of the thing is this, that the silvered paper being always presented at the same angle to the light, does not differ in the amount of its exposure on the ground of differing obliquity. The apertures of the tubes used for the admission of the light being always at right angles with the axes of the tubes, their angular magnitudes do not differ at distances which are equal, and finally the tubes being dull blacked inside, the amount of light reaching the bottom of each will be inversely as the square of its distance from the top.

A strip is being now produced in the window of the room in which I write, and on which the sun is shining.

(To be continued.)

## PREPARING PHOTOGRAPHS FOR EXHIBITION.

BY ROBERT S. REDFIELD.

THE special interest taken by American photographers in the approaching annual exhibition has induced me to offer a few suggestions regarding the preparation of exhibits.

A most desirable requisite in exhibition pictures is that they should interest those to whom they are shown. This result may be attained by their artistic and technical excellence, but it will be well if the subject be one to attract and interest. Many excellent photographs are interesting only to those who made them, and would offer no special attraction to the public generally. Such pictures as the ordinary run of country residences, family groups, and most portrait subjects, do not add to the attraction of an exhibition. Architectural subjects should be artistically beautiful in themselves, or historically interesting, and of course must excel in technique. There is no excuse for absence of the latter quality in subjects which cannot move if they try. Portraits as a rule do not attract from their monotony, and want of what artists would call motive. In this branch of the art, however, if a fine model be selected, a beautiful woman or child, or the head of a handsome old man, there is scope for great skill in posing, lighting, and chemical manipulation.

Many landscapes fail to interest from lack of proper introduction of figures which tell some story or convey an idea in keeping with the surroundings. If the subject is some grand scene in nature telling its own story, man had better be excluded from the view as unnecessary and probably belittling. If a figure is introduced in connection with a waterfall, or where it is desirable to convey a proper idea of height in rocks, &c., it is of the greatest importance that it be appropriately picturesque in dress, occupation, and pose.

Much has been written lately in favour of platinotype and bromide paper prints for exhibition purposes, as being more artistic in tone and effect. This is probably true of the best work by these processes, but if not the best of the kind, the exhibitor had better confine himself to silver prints. From my observation, only negatives of just the proper quality will make presentable bromide or platinum prints. True artistic excellence does not depend so much on the process, as on the manner in which it is used and its adaptation to a subject artistic in itself. Much of the beauty of photographic work consists in its mechanical perfection, the result of proper manipulation of lens and camera, and perfect understanding of the chemical action of the developer. I fail to see why this beauty of finish and detail is at all incompatible with the highest artistic excellence. Many so-called artistic effects in photographs are the result of accident, if not carelessness on the part of the operator, whose first aim should be to learn the proper use of his tools. Such effects are only creditable when, in addition to any beauty they may have, they are intentionally produced by means of a thorough understanding of the capabilities of one's apparatus.

Presuming that most of us will exhibit our work in the form of silver prints, and having selected appropriate subjects, the choice of the special prints for the purpose should be made from several copies after mounting. It should be borne in mind that the slight greenish tint of the glass darkens the print somewhat in framing, hence rather light prints should be chosen. This darkening effect of the glass is aggravated by the fact that most photographs being comparatively small, in a large gallery they cannot well be seen without close inspection, and hence seem darker than in reality. Careful examination in good light is necessary to reveal their true beauty. It is hardly necessary to advise exhibiting in large sizes, full plate pictures really being about the smallest which will do themselves justice. The matter of size is a strong argument for enlargements, but if possible make them yourself, and have the credit of showing work entirely your own.

To go back to silver prints, it is a well ascertained fact that a print very thoroughly washed before toning will weaken less in the fixing bath than one hurriedly washed. Certain toning baths also produce less change in depth of colour, and hence it is advisable to choose a bath with this in view, so as to readily produce at will, prints of proper depth for appearing well when framed.

For ordinary purposes, I think no mount is so suitable for photographs as the white card with an "India tint" margin around the photograph. The creamy colour of the tint strengthens by contrast the high lights in the picture, and at the same time has an enriching effect on the general tone. On the walls of an exhibition gallery, however, the excess of white is not agreeable, and a warmer softer tone is desirable, either in the mount itself or the mat surrounding the photograph. Grey is generally recommended for this purpose. It should not, however, be a cold or bluish grey. This tone kills that of the photograph unless it be one of a very red tone. A warm or brownish grey is the proper tint, and will heighten the pleasing effects of a properly toned silver print. A good method is to mount the picture on one of the regular India tint mounts, and frame it with a mat of appropriate tone and with wider margin than the card usually allows. For a  $6\frac{1}{2}$  by  $8\frac{1}{2}$  print about an inch of the India tint should show, the mat being, say, 14 inches by 17 inches.

Bromide or platinum prints being in pure black and white, do not need any complementary tint in the mat to set them off. A grey mount brings out the high lights more effectively, perhaps, but my choice for such prints is a white mat or mount, mats of white drawing paper being particularly suited for the purpose.

Wide margins accomplish two ends. The most important is the separation of the picture from others in the neighbourhood, so that the eye is not attracted away, and the picture's full beauty is more apparent. This, too, is a good reason for framing pictures singly, and not grouped together in one large frame. A wide margin will, in the second place, if not excessive, often make a picture appear of larger size than it really is. This fact may encourage some of us to make of secondary consideration the natural desire to show pictures the full size of the plate used. Most photographs would be improved by trimming off some portion of their edges. Unless very carefully composed in the camera, more is included at side, top, or bottom than should be. The proportion of 5 to 7, I believe, is considered by artists as the most suitable for general purposes. By cutting an opening 5 by 7 in a large card and placing it over a  $6\frac{1}{2}$  by  $8\frac{1}{2}$  print, it will often be found that a more effective composition can be produced by trimming down to the smaller size, and it can also be determined just where and how much trimming should be done. A picture thus trimmed will do the exhibitor more credit than one in which the fact that he owns a large "box" is more apparent than his judgment in composing his picture.

Having trimmed the print to the proportions most in harmony with the subject, and selected the colour and materials for the mat, there is a relative proportion between the print and the frame which should be observed. It is often assumed that the margin should be equal all around the picture, and pictures are commonly so framed by leading dealers who ought to know better. I have recently seen two valuable pictures positively spoiled in effect from this manner of framing.

To maintain a proper proportion in the frame as well as in the picture, the margins should be wider in the direction of the length of the picture. I cannot give a rule for determining this proportion, but for a 5 by 7 print, an 11 by 14 mat and

\* Read before the Photographic Society of Philadelphia.



frame will be found about right. The margin at the bottom of the picture should be slightly in excess of that at top. Engravings will generally be found to be printed on paper cut according to these rules.

As to the use of a gilt edge to the mat it depends upon the subject. A figure picture of bold, striking character is probably rendered more effective by the slight line of gold. A landscape, or subject full of fine detail, would be better with a plain bevelled edge mat, with nothing to attract attention from the beauty of the picture itself.

This point of concentrating attention on the picture should have a most careful consideration. In a large room full of pictures, slightly greater elaboration in framing is allowable than in one's own parlour, but nothing is so destructive to the best effect in a picture, and particularly in a photograph, than anything in the framing which attracts attention to itself. The frame should be neat and appropriate, but nothing more. Narrow mouldings of oak or other natural woods are most suitable. The addition of a narrow bronze beading has an enriching effect, and if not too elaborate is tasteful and appropriate. Whatever there may be in the way of ornament on the frame should not be allowed to project higher than the moulding proper, or it will be liable to injury in transportation and handling. This is an argument for simple framing of exhibition pictures. The annoyance of having frames injured is greatly mitigated if they are inexpensive ones.

Screw eyes and cords, or wires for hanging, need not be sent with pictures for exhibition. They interfere with compact arrangement in boxing, and generally are not placed as they should be for this special purpose. Hanging committees should place a single strong screw-eye at the middle and back of upper side of the frame, and hang each picture by this eye on a hook driven in the wall. This will avoid all liability of injuring frames in hanging.

It has been justly said that the proper mounting and framing of an exhibition picture is "half the battle." This should stimulate us to study the subject so as not to be at the mercy of the frame maker, who is apt to consider the question of profit to himself more than doing full justice to the picture consigned to his care. Of perhaps equal importance with proper framing is the meaning of the picture. A good picture, with a happily chosen title will appear doubly good for this reason alone. The name expresses the idea conveyed by the picture, and the excellence of each is a help to the other. The idea, if not the exact name, should be clear in one's mind at the time of composing the picture, but just here should be remembered the saying in regard to "art concealing art." Nothing so spoils a figure composition as anything which gives evidence of its having been "made up" for the occasion. A painter, in addition to the care given to the pose and expression of his figures, would carefully select the costumes and accessories to be in perfect harmony with the subject. The camera copies all detail so faithfully that it is even more important that every object in the field of view should be perfectly in keeping with the idea of the composition. I have frequently seen this fault in photographs otherwise most excellent, and even in some which have been awarded prizes. A little more care would have made them perfect, so that they would have deserved in every way the distinction conferred upon them for their excellence in most particulars.

## LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTION.

BY CHAPMAN JONES.

### CHAPTER XVIII.—METHODS OF GIVING FORMULÆ—DEVELOPMENT WITH PYRO—MAXIMS FOR BEGINNERS—FIXING—CLEARING—REDUCING.

THERE are some makers' formulæ that it is impossible to follow, because they are not explicit. Carbonate of soda, for instance, is sometimes qualified as "pure," but whether the weight refers to the crystallised salt or to the dry salt is rarely stated. Now both are articles of commerce, and as one ounce of the dry salt is equal in strength to nearly three ounces of the crystals (nearly two-thirds of the crystals is water), the doubt as to which is meant makes the formulæ practically useless. This remark is applicable to all the formulæ given below in which this salt occurs.

The formulæ of many makers and others remind one of household recipes—a pennyworth of this, a half-pennyworth of that, the juice of one orange, and so on—in the careful way in which they take pains to avoid putting the thing in a scientific and certain form. One is often instructed to take so much of the ingredients and dissolve in so much water, the final bulk of solution to be prepared with the given amount of material not being mentioned. It is this final bulk, always, that is wanted; for instance, it should be stated that the quarter-pound (say) is to be dissolved and the solution made up to one pint, or twenty-two fluid ounces, or whatever is desired. Then ten or eleven fluid ounces as the case may be, contain two ounces of the ingredient, and any subdivision of the original quantity is easily calculated; and it is easy to make an ounce or two of such a developer, by measuring out the requisite quantities of convenient solutions of the ingredients. A still better way of expressing all formulæ is to give the amount of each ingredient in grains per ounce, or other unit bulk, except the ammonia, which is given in minims.

In the following few formulæ, grains of the solids and minims of the strongest solution of ammonia are given to two ounces of solution, as nearly as the eccentricities of the original formulæ will allow; and those containing ammonia are put in order according to the proportion of bromide to ammonia.

	Pyro.	Ammonia.	Potassium Bromide.	Remarks.
Wratten's	6	5	1	Begin with one-third the amount of ammonia and bromide.
Instantaneous	6	5	1½	
Do. Drop Shutter	4	5	1	
Paget	4	4	1½	1½ grain AmBr is stated.
Fry	4	9	5	
Britannia (old)	3	12	8½	6 grains of AmBr is stated.
Cadett's	3	6	4½	
England				
	Pyro.	Sodium Carb.	Potassium Carb.	Sodium Sulphate.
Beach's (ordinary)	8	8 to 24	12 to 36	32
„ (drop shutter)	12	30	44	44
Eastman	8	32	—	48
Autotype Anti-stain	8	32	—	64

The name given to the last formula is highly appropriate, seeing that the anti-staining ingredient is increased to such an enormous proportion. The amount of sulphite of soda originally recommended by Mr. Berkeley was four grains to each grain of pyro., and generally from two to four grains is a convenient and efficient quantity. To get the best negatives it is advisable to use the sulphite, whatever formula for development is adopted. Its chief effects, besides preventing the darkening of the developer and consequent staining of the film, are to give the developed image a better colour, so making it easier to judge of its printing density, and to retard the process of development. This retardation is a decided advantage, except, perhaps, sometimes in portraiture, as it gives the operator plenty of time to use his skill in making what sort of negative he desires.

It will be observed that the first three formulæ are very similar, and altogether different from the fifth, sixth, and seventh, which are also similar to each other. Probably the plates of the three makes last mentioned would be suited by the last formula, and the differences are due to the strongest developer that is safe for the usual time being given in one case, while in England's an average of usefulness is represented.

It is not very clear in what way the last four developers are advantageous to the skilled photographer. The large amount of chemicals represents an expense that ought to yield some return.

As stated before, no fixed formula can be used except in a series of similar plates exposed for equal times on similar subjects, and though there is nothing but careful experience that will enable one to develop properly, the following guides may be acceptable to beginners. The aim of



developing is to get a perfect negative, or a negative that can subsequently be made perfect without more after-treatment than is necessary. Any method that will secure this end is better than the most theoretically perfect method that produces an inferior negative.

Always soak the plate in water first, then replace the water with the pyro and its sulphite of soda, using a sufficient bulk to well cover the plate. The bulk required will depend chiefly on the dish used, and not on the skill of the operator.

For a plate such as Cadett's or England's, take, say, three grains of bromide and two minims of ammonia, mix the pyro solution with them, and re-apply. Wait patiently two, three, or even five minutes, keeping the dish covered except for an occasional inspection. If no image appears, add more ammonia with or without bromide according to the subject.

First develop the high lights, then strengthen the developer for the half tones, and strengthen it as often as necessary to get the detail in the shadows up to printing value. If this cannot be done without fogging the plate, let it fog. It is better to have a good negative that prints slowly, or even will not print at all, than an inferior negative that offers special facilities for rapidly multiplying its evil offspring.

If by this method of development the high lights get too dense, give more exposure, reduce the pyro, reduce the bromide, increase the ammonia, and make these changes in the order given until the desired effect is secured.

Do not use any plates that allow the image to show clearly and vigorously through at the back before fixing. As soon as any detail is developed right through the film its development stops, and the detail that was a little less luminous gets up to an equal density; gradation in the high lights is thus lost. In any case stop developing as soon as any detail is right through on any part of the film. If all the detail is out, intensification may make a good negative of it; if all the detail is not out, it is useless to spend any more time on it.

Do not consider the development of a plate a tedious job until the time occupied exceeds half-an-hour.

Have nothing to do with so-called instantaneous exposures until you can develop a fully exposed plate with certainty.

In the development of plates that have received a minimum exposure, it is generally considered advisable, and it is certainly safe, to proceed on somewhat similar lines to those just indicated, but giving especial care that the parts that are first developed do not get too dense before the dark detail is out.

Plates that are known to be very over-exposed may have the full proportion of bromide added to the pyro and sulphite solution, and the soaking in this may be extended to four or five minutes, and the ammonia may then be added very gradually. This method of treatment provides for extreme cases.

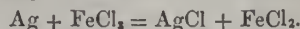
The fixing of gelatine plates is always done with hyposulphite of soda, and the usual strength is four ounces to the pint. It is preferable to dissolve the hypo at least a day before it is required, as this gives time for a slight turbidity that shows on first dissolving to settle down. Nothing should be mixed with the hypo; alum and acids decompose it. The chief matter to attend to is that the fixing salt shall be in large excess, and that it shall have plenty of time to act after the fixing appears to be complete, because the compound formed when the hypo is not in excess ( $\text{AgNa}_2\text{S}_2\text{O}_3$ ) is practically insoluble, and would be detrimental if it remained in the film. With an excess of hypo, a very soluble, sweet tasting double salt is formed, of the composition  $\text{Ag}_2\text{S}_2\text{O}_3, 2\text{Na}_2\text{S}_2\text{O}_3$ . The amateur who works only occasionally should always take a fresh quantity of hypo solution for each batch of negatives developed, and the professional would do well to have two fixing baths always in operation, and to give each negative fixed in the first a minute or two of soaking in the

second. When the first bath shows signs of exhaustion by working slowly, it is rejected; the second bath now becomes the first, and a new second bath is taken into use.

If the negative has been developed as above recommended, it will only need washing, soaking in alum, washing again, and putting to dry. The two washings, and the soaking in a saturated solution of alum, may conveniently each last for half-an-hour, taking care in washing to change the water every five minutes. But if sulphite of soda has not been used in the developer, the film will probably be stained and need clearing.

For removing stains, alum alone is useful, but not very efficacious. Acids are better, but they soften the gelatine and cause frilling. Alum stops frilling, therefore a mixture of alum and acid is generally used. Two or three drops of strong hydrochloric acid may be added to each ounce of a saturated alum solution, or up to half an ounce of acid to 20 ounces of alum solution. Or, alum two ounces, citric acid one ounce, to water ten ounces, gives a useful clearing solution. These clearing agents should be applied after the soaking in plain alum, and before the final washing, and should be allowed to act on the film only just long enough to effect the purpose.

Most clearing solutions have a slight effect upon the image itself, reducing its density. Some photographers make a practice of putting every negative into an acid solution considerably stronger than those mentioned above, to reduce the image slightly and so give quicker printing qualities to the negative; but this needs special care lest the reduction should go too far, or the film should frill off the plate. If reduction is necessary, it is a better plan to dissolve away the image as far as is necessary. This is done by changing the silver of the image partially into chloride or bromide, and dissolving away this salt. There are many ways of changing the silver into its haloid salt, and there is little to choose between them. Ferric chloride, cupric chloride, chloride of lime, hypochlorite of sodium, or the corresponding potassium salt called eau de Javelle, either will, by the simple application of its dilute solution, effect the change. With ferric chloride, for example, we have



The chloride of silver is then to be dissolved away by re-fixing the plate, and the reduction is complete. The drawback to this method is that the extent of the reduction is determined by the first action, but is not visible until the hypo has dissolved off the compound formed. What is wanted is that the acting and the dissolving ingredients shall be mixed, and thus that the reduction shall go on only as it proceeds visibly. But as hypo speedily re-acts upon such oxidising re-agents as those mentioned, this end cannot be accomplished in so simple a way as might suggest itself to the non-chemist. J. Spiller has recommended a solution of cupric chloride with a large excess of common salt, as common salt will dissolve chloride of silver, and does not react upon the copper salt. But the neatest, and otherwise the preferable, method is due to E. H. Farmer, and consists in using red prussiate of potash (ferricyanide of potassium) for the oxidizing agent, as this may be mixed with hypo for a considerable time before an injurious amount of reaction takes place between the two compounds. The use of this reducing reagent will be described in the next chapter.

(To be continued.)

## COMPOSITION AS APPLIED TO PHOTOGRAPHY.

BY DAVID R. CLARK, M.A.\*

SOME photographers think that if they set their cameras down before a subject, carefully focus it, and after giving the plate the proper exposure, they are then in possession of a correct and beautiful picture, which, with careful development, will produce

\* A Communication to the Glasgow and West of Scotland Amateur Photographic Association.



a perfect and artistic reproduction of nature. To a certain extent this is true, but the making of a picture depends upon the position of the camera, and what is taken into the field of the camera and what is left out. In other words, it is at the beginning of the operation that the work of an artist is principally found; the rest of the labour is gained by experience and a careful watching of the details of a technical process. However good the position chosen, without careful exposure and development you cannot produce a good photograph; but conversely, however careful the exposure and development, without a careful selection of position you will not produce an artistic picture. At all events, if you do, it is more due to chance than anything else; or, in other words, to "luck than good guiding."

If two photographers choose the same subject, as very often happens, even although they may be both technically proficient in photography, and the photographs produced may be equally like nature, yet generally one will be superior to the other, because the one man had more the eye of an artist and chose the best position, with the result that his was a picture, whereas the other's was a mere transcript of nature. We frequently see photographs forming the most charming pictures; more frequently, however, we find them forming no picture whatever, although we know the places taken to be most beautiful in themselves.

Composition may be defined as not only the arrangement of the subject, but its production from a preconceived idea. It is choosing such a point of view as will give the best effect, and the arrangement of the objects in the picture relatively to one another, and collectively with regard to the whole, that they will form a general design.

Mere technical knowledge of the rules of composition will not avail. It is the artist's eye that see the difference between dry matter-of-fact imitation, and ideal selection of nature, and show thereby the wide difference between merely mechanical and intellectual art. The object to be achieved is not how closely the individual things in a photograph have been exactly copied from nature, but how powerfully the artist has embodied the impression that nature makes on the mind.

To illustrate this, however, more clearly, let me mention a few rules that may be found useful. These rules are not without exceptions—in fact, they may be said to be suggestions more than rules—but the exceptions, if fairly examined, may only go to more firmly establish the rules themselves. Circumstances, however, so alter cases that no arbitrary rules can be laid down; indeed, it is far easier to say what should not be done than what should be done. The four straight lines that form at right angles the usual boundaries of a picture present an obstacle to the photographer, as they produce artificial limits to his view, for of course every one knows as well as the photographer himself that natural views have no such boundaries. This may seem at first sight an unimportant fact, but it lies at the root of the difficulties with which the photographer has to contend in the composition of his picture. If possible it should be his endeavour to make the spectator forget these artificial boundaries, looking into the picture as at nature, and forgetting the artificial in the beautiful.

The first rule I would suggest for your consideration is: Never place the principal object of size or interest exactly in the middle of the picture, either vertically or horizontally. A central position divides the surface into equal parts, and produces uniformity rather than variety. To illustrate this, I now show you a picture of a village church in the centre of this paper. The spire is in the centre. Trees on each side. Pathway leads straight. Shape is square, uniform—in fact, the most uniform that could be chosen. This (illustrating) is one of the worst examples. Let us take a position to the side of the former view and place the subject to greater advantage, thus reducing the foreground. We now see in the illustration which I have sketched how the whole becomes a picture.

The second rule which I offer for your consideration is this: The photographer must make every effort to convey the idea of atmosphere in his picture, and endeavour to realize the idea of the separation of the various objects in a picture. To convey this idea "none of the principal objects or leading features of his picture should be perpendicularly over or horizontally level with each other, because if they be so placed they either repeat actually or by suggestion the horizontal and perpendicular lines which artificially limit his picture, and which require to be concealed as much as possible from observation."

In Harding's illustrations of this law you will find how true this is, and every one must know by experience how the altera-

tion of the position of the camera nearer to a tree or other object raises its height, and thus lifts it from the horizontal line that it would otherwise form with other trees or objects. Frequently it happens that long straight lines are so connected with the subject that they cannot be suppressed. In this case the best way to get over the difficulty is, if possible, to introduce contrasting lines to break the monotony. A piece or two of timber placed against a wall, or a tree branch, may be used; or the foreground may have sufficient interest in it to lead the eye away from the monotony of the straight wall. Figures, of course, are what is wanted, and if you can get someone to stand in the proper position, you can in that way overcome the difficulty. The great point, however, is to make the figures natural in pose, not to appear as if being "took." In landscape it should be always remembered that figures should not be the centre of attraction in themselves apart from their connection with the picture, and the moment they overstep this they become very objectionable.

When we have selected our position for a picture, there may be an uninteresting foreground, and we should, if possible, avoid that, unless it is for the purpose of introducing a contrast of repose to motion or life in other parts of the picture. Thus, a strip of smooth sand with a quiet pool reflecting the sky comes in as a splendid contrast to a rough, tumbling sea dashing on to a shore; or a long stretch of moorland, which is too quiet and tame in the middle distance, may be finely relieved by clumps of bracken or heather, or by a few rocks in the foreground.

Again, suppose you have a mountain scene with a loch, but there is no decided foreground at the spot you are standing on, look around, and, perhaps, a few yards off you may see a few rocks from which your photograph may be taken, and which in themselves present the desired contrast. Common sense will suggest at once that the scene should be taken from the rocks, and the rocks themselves should be introduced at that point where they will appear to the best advantage; but they should not be made to repeat again the form of the mountain or the circle of the lake, but contrast with them.

The third rule, and it is probably the most important of all, is this: There should be in all compositions one chief point of interest. If it be large there is no limit to the lesser points of interest in the picture, provided you keep them subsidiary, and do not let them detract from the one chief point of interest you have in view. "To choose a subject well, you should always think how it will compose in your picture," either with or without the accessories of figures or other effects. Fix upon the subject you wish to photograph, and let all the accessories contribute to form the picture; do not let them detract from its interest by leading the eye to centre on them instead of the picture itself as a whole. Where figures or accessories are introduced they should be placed not where the landscape interest is in itself strong, but where it is comparatively weak. For example, an open expanse of field is always a trying space to represent agreeably. There a group of sheep or cattle at a distance may come in naturally, and form a pleasant contrast. The straight line of a river's bank, such as in Mr. Snell Anderson's picture exhibited at last exhibition, was relieved by the cattle along the bank, and helped to give interest to a picture that might have been otherwise monotonous in detail.

A bridge presenting a long, straight line on the top is relieved by a figure or two looking over the parapet, and they tend to keep the eye occupied with an interesting detail in a portion of a picture which would be uninteresting, and the straight line in which by itself, when so prolonged, would be an inartistic feature. I now show you an enlargement of a photograph I took of Inchinnan Bridge, and you will see how I have endeavoured to select a suitable point of view, and how the figures on the parapet of the bridge relieve the straight lines.

A fourth rule of composition is: That the two sides of a picture should balance each other nearly always in either interest or mass, or both combined. But the best form is the last named, where the smallest mass has the greatest interest; but the reverse equally holds good. Where you have on the right, say, a cart returning from a hayfield, with figures in the foreground, a nicely arranged lighter and distant background on the left, although in itself too distant to form a complete picture, may have sufficient interest to heighten the effect of the prominent mass in the foreground.

Further, to form a good picture, not only the masses combined with the interest must balance, but the light should be concentrated on one point and the shadow on another. It is a necessity to have some leading mass of light towards which the eye



is directed; also, on the other hand, the same principle applies where there is a leading mass of dark on which the eye may rest without being disturbed by any other equally effective portion of the picture; and upon the size and position of these relatively will depend the general effect of the picture.

Let us consider where the high light should be placed to be most effective. I draw an oval within a parallelogram representing an ordinary picture. It is bisected by a line horizontally, and by a line vertically. The high light should not be found in the centre, as it is too formal there; or in the corners, because if in the latter the eye would be drawn away to it from the general interest of the scene. It may occupy any place within the oval, in fact, other than centering on the lines. It should be placed somewhat removed from the centre, but not concentrated in any of the corners. I will now show you a number of engravings of well-known pictures to illustrate this.

The French consider a landscape is no picture unless it has three planes or parts. The first plane is the foreground, the second plane the middle distance, and the third plane is the extreme distance. Endless variety may be given to the composition by varying the size and importance of these. If the extreme distance is absent a shut-in feeling is produced, and a little peep of distance should be got in if possible. If the middle distance is not seen the effect is theatrical, and although a fine landscape may be without a visible mid-distance, we know and feel it is, and must be there. Both these can, however, to a certain extent, if one or other is absent, be indicated by a floating cloud, or a printed-in sky. In fact, by carefully selecting and printing in a sky, we can give quite a different character to a picture; but it is important that a suitable sky be chosen in accordance with the feeling of the scene, and the impression on the eye that we wish to produce. If the foreground is omitted, all strength goes out of the picture.

Lastly, if the mid-distance and extreme distance are absent, the photograph is no longer a landscape, it is merely a study; and even in the latter it is better to have some gap in a hedge or open gate or window to catch a glimpse of distance.

I might speak of the effects produced on figures by light against dark, and *vice versa*, but time and your patience will not permit this, as I have already trespassed too long; but let me say in conclusion, what applies to landscape in general applies to groups and figures also. In making a study or landscape try to catch the expression of your model or the character of the scene.

Above all things, never copy. In the words of a well-known author, "Copying the work of others utterly stunts imagination and self-dependence." It is important not to do this, for we must in the long run depend on ourselves. It is better to get into the habit of depending on yourself at first and for ever. Let us be self-reliant; do not let us be so self-conscious, but humble, knowing that in making pictures our best attempts are far behind the great masters who have made their names famous in the great world of art.

If we study nature we shall have the reward of the pleasure she gives only to students; but let us watch her varied expressions and take her with her "best face on," so to speak, and she will reward us with many a lovely picture to remind us of summer days and brilliant sunshine, while sitting by the winter's fire.

## THE ORIGIN OF BLISTERS ON ALBUMEN PRINTS.

BY W. H. SHERMAN.

THE blistering of albumen prints has been for the last quarter of a century and more one of the unexplained mysteries of photography. It now having been ascertained that they are caused by carbonic acid gas, a question no less perplexing confronts us, and this is, Whence comes this gas?

In an article written for the "Photographic Times Annual" this year, I have given my views regarding its origin, presenting what appear to me some valid reasons for believing it to be generated by the action of the hypo on some compound in the prints themselves, and further, that the gas is uniformly generated in the fixing of albumen prints, whether blisters are developed or not.

This explanation will be denied by those who hold that blisters are due to some accidental condition either of the water, silver-bath, or paper. Doubtless it will be admitted by those who are most familiar with the subject that neither a faultless

silver-bath nor the most perfect paper, if highly albumenized nor both together, will afford protection against the evil.

It is not so easy to decide that the source of the trouble is not in the water. On this point I have a few suggestions to make in addition to what was before offered. First, I have washed prints alternately in hot and cold water just before fixing. As I anticipated, no harm was done to the prints by this. It hardly need to be said that to do this immediately after fixing would insure the ruin of the prints by blistering. The strong inference is that the gas which is not in the prints before fixing, is there immediately after fixing, and, therefore, must have been generated while fixing.

But most of the water in use contains carbonic acid. How do we know that what causes the blisters does not come from the water used to dissolve the hypo? I answer, from having often made this bath several days before using. If the gas were present in the water at the time of mixing the bath, it would escape by standing in an open pan in much less time than it has been allowed to stand, although the trouble occurs in the same regular order as when the bath is used directly after making it. Evidently blisters are not caused by gas held by the water in which the hypo is dissolved.

There is, however, another source from which the gas may be generated. Some water contains the bi-carbonates of lime and magnesia. The reduction of these by the hypo might possibly liberate sufficient gas to account for the blisters. The question then arises, does the water in fact hold in solution salts from which the gas is generated? Without knowing the exact constituents of the water used, this does not appear to be a difficult question to answer. To test the water of Lake Michigan, for example, I take two test tubes, one of which is filled with lake water, and the other with a strong solution of hypo. A part of the latter is then carefully poured into the former, and the result closely observed. If any gas were liberated it could be easily seen. But in this experiment the heavier liquid mingles smoothly with the other without the least sign of gas, proving that no salts are present from which it can be liberated in this way. My conclusion then is, that neither the water nor anything which it holds in solution is the source of the gas which causes the blisters. If this conclusion is wrong, I hope to be convinced of the fact.

Now I beg leave to indulge in a few words of hypothetical speculation. Consider the formidable formula of the albumenate of silver. We are informed on such high authority as Lieberkuhn, that this substance contains, among other things, no less than seventy-two atoms of carbon to one atom of silver. It is generally held that the silver forming the printed image is oxidised, and that the image is an organic compound. Why may not this other organic compound, the albumenate of silver, also undergo oxidation in the process of printing, and if so, why may not its reduction or decomposition by the hypo liberate the gas in question, which is nothing more or less than oxidized carbon? Supposing the silver of the oxidized albumenate to be converted into hyposulphite of silver, the united escape of oxygen and carbon (otherwise carbonate acid gas) may be imagined. Such suppositions and conjectures are very unscientific, I confess, but when given as conjectures only, need do no harm.

This is not the only question in photography in regard to which we are obliged to wait for the day when conjecture will give way to exact knowledge. Possibly, even conjecture may directly or indirectly hasten its coming.—*Photographic Times*.

## Reviews.

JAHRBUCH FÜR PHOTOGRAPHIE UND REPRODUCTIONS-TECHNIK FÜR DAS JAHR 1888. Von Dr. Josef Maria Eder. Halle a. S. Verlag, von Wilhelm Knapp. Price 5.75 marks (about 6s.)

WE unhesitatingly say that the magnificent work now before us is so far ahead of any photographic year-book yet produced, as to make a direct comparison between it and the best of those yet produced, altogether a one-sided affair.

It consists of no less than 556 pages of reading matter, with which are bound up rather less than fifty pages of advertisements, and it forms in itself a very carefully wrought and systematic representation of the actual con-



dition of the art of photography at the present time, with some notable emphasis on the special work of the past year.

An excellent feature is the freedom with which it is illustrated, there being not only over a hundred wood-cuts, but also twenty-one inset plates illustrating the various methods of photo-engraving and photo-reproduction. The frontispiece is a portrait of Obernetter, and is engraved by his etching method; and the following plates deserve special mention: a reproduction of a charcoal sketch, photo-engraved in intaglio by H. Riffarth, of Berlin; some block prints by the same photo-engraver; collotypes by Adolph, of Zittau; half-tone zinc etching by Blechinger, of Vienna; collotype with high gloss surface by Prager, of Berlin; gelatinotypes by Husnik; zincotypes by Angerer and Göschl; and very bright stipple zincotypes by Gaillard, of Berlin.

Every photographer—whether he reads German or not—should obtain Eder's year-book, if only as an album illustrative of photo-mechanical methods.

ANNUAIRE PHOTOGRAPHIQUE POUR L'AN 1888. Publié par le Bureau des Longitudes. Prix 1 fr. 50 c. (Paris: Gauthier-Villars et Fils, Quai des Grands-Augustins 55. This is virtually an equivalent of our Nautical Almanac, and contains much matter of interest to photographers, especially in the section devoted to tables of constants. The comprehensive tables of refraction indices may especially be mentioned.

### Notes.

"The collection of specimens of photo-mechanical printing processes on view at the Camera Club is extremely interesting, but, like most exhibitions of this kind, it only shows what can be done under the most favourable conditions. If the examples are exhibited for this purpose, nothing can be more satisfactory. If, however, anyone runs away with the notion that by sending a photograph to any of the exhibitors it will be returned to him in a short time in the form of a block which will give in any ordinary printing press and with ordinary paper and ink a print equal to the specimens shown, a very great mistake will be made. The most exasperating thing about these photographic printing processes is that the specimens look so lovely, and the average commercial product so miserable. That, at least, is my experience as one connected with newspapers. Of course, if time and money be no object, good things can be done, but what is still a desideratum is a reproduction from a photograph which will stand rapid printing on fairly good, but not super-excellent paper." Thus writes a correspondent.

A story has been going the rounds of the Parisian papers of which a well-known artist is made the hero. The real actor, however, was a photographer, and it is not easy to understand why the painter was substituted. The photographer in question had his studio on the roof of the house, as most photographers who have businesses in crowded cities are obliged to have. To get to the studio in this case meant climbing up seven distinct staircases, and knowing the stumbling block this was in the way of obtaining sitters, he resorted to an ingenious plan for getting over the difficulty. At the entrance lobby he had a placard.

"Photographs only ten francs the dozen. Studio on third floor." Up went the sitter to the third floor to be encountered by a notice: "M. —, Photographer. Studio has been removed to the 5th floor." Again he toiled upwards, and came face to face with the following: "The studio has, owing to the rebuilding of the premises, been temporarily removed to the 7th floor." Of course, having mounted so high, the sitter did not think it worth while to descend, and so at last he got to the roof by ingenious if not by easy stages.

A later example of ingenuity in another direction has just come under our notice. A city photographer has had four cards prepared, each numbered from one to four, and each containing one of the following questions. "1. Will you have a drink?" "2. Yes." "3. Who will pay for it?" "4. I will." The person who is in the secret deals out the cards to his unsuspecting friends, and then says, "Who has No. 1?" No. 1 answers, and reads out the question. No. 2 follows, and so on, to No. 4, who finds himself saddled with payment. The dealer of course takes care not to deal No. 4 to himself. It may be asked, what has this to with photographers? Nothing whatever, save as an advertisement to the particular photographer who has his name, address, and prices printed prominently on the cards.

This is from a brisk little paper published in Glasgow, and called *Quiz*. Highland simplicity—scene Stornoway. *Amateur Photographer*: "Donald, run down and bring up my camera." *Donald, on his return*: "She's sorry, sir, but Mr. Cameron's jist awa' oot on the pownie, but they say he'll be back shortly."

Photographers in Western America have occasionally a very pleasant time. Talking recently with the managing director of a mining company who has just returned from Colorado, where the mines are situated, we asked him how he managed to secure the really very excellent series of photographs he had brought with him. "Oh," said he, "we had to engage a photographer who lived seventy miles away. We're fifty miles away from the nearest railway station, and the road for half the distance means ascending a mountain. It was hard work for the photographer, you may guess. When we got him we kept him for three weeks, boarded and lodged him, and when he wasn't photographing he amused himself by searching out for relics of old Indian encampments, bones, and suchlike. But he knew his work, in spite of his fancy for hunting for curiosities." The criticism was just. The fifty or sixty 9 by 7 photographs illustrating the district and the mining operations are as good work as one would wish to see.

The photograph is being used just now, for the first time we believe, in a systematic way, in promoting emigration. It would seem that the active propaganda which is taking place amongst the Crofters with a view to inducing them to transfer themselves and their families to lands over which the Southern Cross shines at night, is being aided by the lavish distribution of photographs taken for the



purpose. A Crofter is presented, in fact, with an actual view of the kind of homestead and its surroundings which would be his if he listened to the voice of the Sirens—for ladies now take an active part in this canvass for emigrants. He is invited to "look on this picture and on this," or in other words to compare the photographic possibility with the existing reality; and it is not strange that the pictorial appeal is proving much more successfully persuasive than the lectures, or the pamphlets, or the blue-books, or the advertisements which have been hitherto employed as aids to emigration.

Nor is this strange. Donald is a 'cute and canny fellow, and however much he may mistrust figures and gainsay the fair words of emigration agents, he considers it quite another affair when he is shown a neat little model dwelling nestling in greenery, and standing in grounds far more extensive than any croft he has ever dared to dream of in his most sanguine moods, and told that it may become his home virtually for the asking. And seeing how eloquently these photographic views of Tasmanian fishermen's dwellings are pleading the cause of emigration, we should advise any country in urgent need of relays of emigrants to set the camera to work at once. A book of carefully-selected photographs will have more effect on the average working man than a stock of Parliamentary returns or a regiment of glib agents. But of course there must be the necessary guarantee that the photographs are what they profess to be, and not taken from imaginative negatives prepared "with a view to deceive." It would never do, for example, to palm off on ingenious artisans a series of photographs, say of New York, as faithful pictures of the present state of Eden City or New Damascus, or the lately founded township of Pokers Flat. Before emigration photographs become generally used, in fact, it may be well to arrange that all views circulated with the object of inducing emigration shall have an official *visé* of some kind.

A New York photographer had a singular experience the other day. Receiving instructions from the police head-quarters to obtain a photograph of the sacred shrine in the Joss House in the Chinese quarter of New York, he proceeded to Mott Street, where the temple is situated, for the purpose. Here he met with determined opposition from the custodian of the temple, but after arguing for about an hour succeeded in getting his camera planted in front of the Joss. In the meantime the news of the indignity which was about to be offered to the god had spread, and a crowd of excited Chinamen rushed in just as the photographer was about to make the exposure. Things looked very ugly for the photographer, who was about to seize his legs—we mean his camera legs—to defend himself, when the timely arrival of the deputy Chinese sheriff averted immediate danger. Thanks to the good offices of this official, who guaranteed that the artist would not take away the soul of their god for the benefit of the Christians, and explained that he simply wanted his beautiful face for the gallery at the police head-quarters, the worshippers allowed the photographer to

proceed. But directly he had gone and taken away his suspicious looking instrument, the frightened Chinamen fell down on their faces before the Joss and asked his forgiveness, promising to give him an extra roast pig or two if he would overlook the sudden intrusion.

A correspondent writes: "Mr. Mercer, whose letter appeared in your issue of the 13th ult., on the 'Insurance of a Studio,' has, I fear, no remedy. The insurance offices simply say, 'These are our terms, accept them or leave them.' I drew attention to this very subject some two years ago, because the risk of fire being minimised, owing to the abolition of collodion, it seemed to me some reduction should be made. The office to which I applied, however, did not or would not understand the difference between collodion and gelatine, and the high rate remained in force. The rates in London appear to be lower than those in Dublin, as I paid 3s. 6d. per £100 for extra risk, the ordinary rate being 1s. 6d. My studio is not now used for photographic purposes professionally, and on my representing this to the office the payment for extra risk was taken off, and the charge is now 9s. for the whole of the premises instead of £1 10s. The only way of bringing pressure to bear upon the offices would be by photographers combining and sending a deputation to discuss the question with the directors. As insurance is voluntary, and not compulsory, it is clear that the matter must be arranged like any ordinary bargain."

#### PHOTOGRAPHY AND THE PRINTING PRESS.

BY H. TREMAN WOOD.\*

ALL true printing processes may be classed under one or other of the three following heads: (1) Copper-plate printing from an intaglio plate, which delivers the ink to the paper from lines incised into it, its cleau and polished surface not transferring any mark to the paper; (2) Letter-press printing, in which the block delivers the ink to the paper from its surface, the hollows or recesses in that surface being lowered to such a depth below it that the paper does not touch their bottoms, and so receives no ink from them; (3) Lithographic printing, in which the whole printing surface is smooth and level, but part is of a nature to receive ink, which it transfers to the paper, and part is of a nature to repel the ink, so that it remains clean, and does not mark the paper which touches it.

To all these varieties of printing, photography can be, and is applied. Intaglio plates can be produced by its means, so can surface blocks. Not only is it a most important adjunct to lithography, but the whole type of collotype processes may, without much inaccuracy, be placed in this class. Woodbury-type, that most ingenious and beautiful process, I am inclined not to regard as a true printing process, since it is really a mechanical method of producing castings of half-tone carbon prints; but if it is to find a place among printing processes in the narrowest sense, I would like to be allowed to class it with intaglio plates, since a Woodbury mould may be considered as an exaggerated plate, giving up its ink from its hollows, not from its surface. I would suggest that for some future meeting you should secure a paper on Woodburytype from some one of the skilled operators who practise it, and perhaps you may even induce him to demonstrate the process before you.

The subject is so wide a one that I propose to confine myself mainly to a portion of it, the production of metal blocks and plates for printing in copper-plate or type presses, though I cannot altogether omit some references to the other kindred processes.

The problem of producing a printing-block or plate from an

\* Read at the Camera Club.

+ Slides illustrating the differences between the various classes of printing were shown on the screen.



ordinary half-tone negative is divided into two parts. First, it is necessary to turn the gradations of the negative into lines or dots which will hold the ink; and secondly, when this has been accomplished, it is required to produce a surface of some sort from which printing can be effected. With your permission I will take the last half of the question first. I do not know, nor do I very greatly care, whether this method of proceeding may be the more logical; but I do know this, that I do stand a better chance of making myself intelligible by adopting it.

Given, then, a line negative—a negative, that is to say, from a drawing, engraving, or sketch, in line or stipple—anything, in fact, that will by any process give a print in ink, and let it be required to produce from it a surface block. There are many methods which might be employed. One of the most natural to present itself would be a modification of the old etcher's process.

You are probably all of you pretty familiar with the manner in which an etched plate is produced. A polished plate of copper is covered with a thin coating of material, the principal ingredient in which is wax, known as an etching ground. On this ground, which for convenience of working is generally blackened, the artist sketches his design with a fine point, laying bare the metal in the lines which he draws. When his sketch is completed, the plate is put into an acid bath. The acid attacks the metal in the lines, leaving untouched the smooth surface of metal which is covered by the wax. As soon as the biting-in is completed (and there are many details necessary to ensure success, on which I will not now dwell—such as covering up certain portions of the picture when the etching has proceeded far enough, and allowing the acid to act for a longer time on other parts), the etching ground is cleaned off; and the design then appears in incised lines on the smooth metal. To print from such a plate, ink is rubbed over the whole of it, and the surface is wiped clean, the ink remaining in the lines. When the paper is forced down upon the plate in the press it takes up the ink out of the lines, remaining clean where it has touched only the clean surface of the metal.

Apart entirely from photography, the process of etching has been adapted to the needs of the wood-engraver. Some few years ago, Mr. Bruce took out a patent for what he termed "White-line Etching," a process in which the acid is caused to eat away the metal from the parts which become the whites of the finished picture, so as to give a surface block. The artist draws on a zinc block prepared with an etching ground; but he draws in white, removing the ground from the portions intended to print white. As you may judge from the specimens exhibited, the process is capable of giving excellent results. I do not know whether it has come at all into use; but, if it has not, it must be only because the rivalry of photographic processes has been too much for it.

To apply the etching method by means of photography, the first essential is a protecting surface corresponding to the etching ground, and capable of being produced photographically. Here the well-known sensitiveness to light of bichromated gelatine, or other mixture of an alkaline chromate with a colloid substance, may be pressed into service. If we prepare on a metal plate a film of bichromated gelatine, expose it under a negative, and develop it in hot water—if, to put it shortly, we develop a carbon print on a plate of zinc (remember we are dealing only with a line negative) we shall have pretty much what is required, a coating which will protect the metal under the lines of the finished picture, leaving the rest of the metal surface bare. But these lines of gelatine are but a poor protection from the acid, and it is necessary to reinforce them. How is this to be done? Simply enough, by the aid of the lithographic principle. You know that the lithographic process is based on the mutual repulsion of grease and water. A greasy stone cannot be wetted. A wet stone will refuse to take ink. If, then, a design be drawn in greasy ink on a lithographic stone, or on a plate of zinc, and the stone be then carefully damped all over, it will only take up the water where there is no ink. If next the wetted stone be rolled over with an inking roller, the lines will take up the ink, and be reinforced, while the wet parts will repel the ink, and will remain clean. Such, at least, is the principle, baldly stated; like a good many other things, it sounds simpler than it is in practice. The stone has to be carefully washed over with an acid solution of gum, and many precautions taken before the perfect result can be attained. Now, if we apply the same process to the gelatinous print on our zinc plate, the lines can be made much stronger, and capable of resisting the action of the acid bath. It would, therefore, appear that nothing more is

required but to put the plate in the acid, and to leave it there until the acid has eaten away a sufficient amount to give the depth required—printing depth, in fact. So one might think—and so, indeed, thought the earlier experimenters with the process; but let us see precisely what will happen. When the plate is first placed in the acid, the bare metal will be attacked, and the acid will commence to dig out little pits or furrows between the protecting lines and patches of ink. But each of these pits has sides as well as a bottom, and there is no reason why the acid should confine its action to the metal at the bottom of the pit, where it is wanted, while it leaves untouched the equally-exposed metal at the sides. If, then, the action is permitted to continue uninterrupted, the result is that the acid eats away underneath the lines of ink, thus undermining the protecting covering. The lines are therefore weakened, and become what is technically known as "rotten"; if they are fine lines, being thus attacked from both sides, they will probably disappear altogether.

For a long time this undercutting of the lines was the great difficulty in all these processes, but eventually it was surmounted, and the way in which it was surmounted is very ingenious. It was, I believe, the invention of M. Gillot, a Frenchman; and his process, originally known as Gillotage, is at the basis of the production of all etched blocks. It is, like most important inventions, extremely simple when you know it. After the first etching, the plate is inked over; then finely powdered resin or asphalt is dusted over the plate, which must be perfectly dry, when it adheres to the inked lines, but is easily shaken or dusted off the remaining parts. The plate is then gently warmed, the resin melts, and the mixed ink and resin run down the side of the furrow till they reach the bottom. As soon as they have gone thus far, the plate is allowed to cool, or is cooled as rapidly as may be. It is then subjected to a second etching, the depth to which the acid is allowed to penetrate being not more than the thickness of a sheet of notepaper. Then the process is repeated, and so it goes on, with alternate etchings and inkings-up, until the requisite depth has been obtained, when the side of the furrow formed by the acid presents a series of little steps.\* Very often, instead of developing the film on the plate, the coating may be first prepared on paper, and the picture transferred in the manner usually employed for lithographic transfers to metal for etching. This method is quite as important as the direct method, but I have not time to say more about it this evening.

But bichromated gelatine or albumen is not the only substance acted on by light in such manner as to render it available for our purposes. Another medium most convenient, and one very largely used, is bitumen. In this process, the sensitiveness of resins to the light, a fact discovered by Niepce, is employed. A zinc plate, properly cleaned and polished, is coated with a thin and even film of bituminous varnish. Ordinary varnishes are rather slow in their action, though they give perfectly satisfactory results when there is no objection to a lengthened exposure. The asphalt varnish, known as "liquid jet," answers admirably for experimental purposes, if it is diluted to about half its strength with benzole. When greater rapidity is required, the bitumen is first treated with ether, until all the portions of it which are soluble in ether are dissolved out. The insoluble residue is then dissolved in benzole, and a varnish obtained which is extremely sensitive to light. In practice, to secure a thin and even coating, a rapid spinning motion is given to the plate by some convenient device, so that centrifugal force drives the varnish out towards the edges and off the plate, leaving only a thin covering. A special whirling table may be used for this, or a convenient hand-device, consisting merely of a clamp and a handle like that of a carpenter's brace, by which the holder with the plate in it can be rapidly rotated, is most frequently used. In practice, quite satisfactory results can be obtained by the use of a lathe, the plate, after being flooded with varnish, being rapidly secured on the face plate. This method for securing thin and even films is essential, whatever be the sensitive surface employed, if that surface is prepared by coating a metal plate.

After exposure under a negative, the plate is treated with a solvent—generally turpentine with a proportion of benzole. The turpentine is a slow solvent, the benzole a rapid one; and by a judicious application of these, great latitude of exposure

\* The process was illustrated by diagrams on the screen (some copied from the PHOTOGRAPHIC NEWS), and by an admirable series of examples of the different stages, kindly prepared for the lecturer by Messrs. Walker and Boutall.



can be secured. The parts unacted upon by light are rapidly dissolved, the remaining portions being left unaffected. I have never heard any reason given for this alteration in the nature of the varnish. The change would appear to be a molecular one; but, so far as I know, the reason of the action remains open to investigation. The after-treatment of the plate is the same as described above; the bitumen, however, is in itself sufficient to protect the plate for this first etching without the addition of ink.

(To be continued.)

## THE LITERATURE OF PHOTOGRAPHY.

BY W. JEROME HARRISON, F.G.S.\*

(12) *BAZAAR (THE), EXCHANGE, AND MART*, and *Journal of the Household*. 4to., Tri-Weekly (Monday, Wednesday, Friday). Price 2d. Office, 170, Strand, W.C. 1868-1888. +

*The Bazaar* has contained several serial articles on photography, of which we may name specially those by O. E. Wheeler, which have been re-published in book form. It usually also contains numerous advertisements of photographic apparatus for sale and wanted. Vol. xxxvii. is now in course of publication.

(13) *BENGAL JOURNAL OF THE PHOTOGRAPHIC SOCIETY* OF. 8vo. 1857 to (1870?). Calcutta.

Nos. 2 and 3 are in the British Museum Library; and there is a reference to it in the *PHOTOGRAPHIC NEWS* for 1865, p. 470.

(14) *BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, REPORT OF THE*. Yearly, from 1831 (York) to 1887+ (Manchester). Fifty-seven volumes. 8vo. Published by John Murray, Albemarle Street, London.

The published price has varied from 12s. to 26s. per volume; but is now 24s. per volume. The back volumes can, however, usually be obtained at from 2s. 6d. to 10s. per vol.

In the early days of photography—say from 1839 to 1860, or thereabouts—frequent papers were read before the British Association on photographic subjects, but of late years this has not been the case. As a resumé of British science, the annual volume is, notwithstanding, invaluable.

(15) *BRITISH JOURNAL (THE) PHOTOGRAPHIC ALMANAC, and Photographers' Daily Companion*. A complete compendium of Photographic Art-Science. 1861-88. +

The volume for 1861 was "presented to readers of *The British Journal of Photography*," and contains pp. xlii. and 56. It was of a small size, to "allow of the almanac being placed in any pocket-book." No charge was made for the first five or six volumes of the *Almanac*; the volume for 1868 was sold for sixpence, and the price of all subsequent volumes has been one shilling. The volume for 1888 contains 712 pages; it is an octavo volume, published at 1s. (paper covers), by H. Greenwood and Co., 2, York Street, Covent Garden, who have published the "Almanac" from its commencement.

The first two volumes (1860-61) were edited by Samuel Highley; that for 1863 by Jas. Martin; 1864 by Emerson J. Reynolds; from 1865 to 1879, and 1887 and 1888, J. Traill Taylor; the volumes for the seven intermediate years 1880-86 being edited by W. B. Bolton.

*BRITISH (THE) JOURNAL OF PHOTOGRAPHY*. See *Liverpool Photographic Journal*.

(16) *CAMERA (THE)*. A monthly magazine for those who practise photography. No. 1 for June 1st, 1886. Each number contains 26 or 28 pp. of letterpress, a whole page illustration, and wood cuts. Edited by T. H. Hepworth, and published by Wyman and Sons, 74, Great Queen Street, London, W.C. Price 6d.

Vol. i., June 1886, to May 1887, contains 314 pp. and index (iv. pp.)

(17) *CAMERA CLUB, PROCEEDINGS OF THE*. Monthly.

No. 1 for December, 1886; 4to. Printed by Wyman and Sons, and published (for members only) at the Camera Club, 21, Bedford Street, Strand, London, W.C.

The first three Nos. consist of 10 pp. each (besides advt. pp.); No. 4 has 20 pp., and subsequent Nos. 16 pp. each. Vol. i. contains 13 Nos. (December 1886, to December 1887), but subsequent vols. will run with the year.

(18) *CANADIAN JOURNAL OF PHOTOGRAPHY*. 1864 monthly. Toronto, Canada.

(19) *CHARTERHOUSE (THE) PHOTOGRAPHIC ART JOURNAL*. Designed to give information on modern progress in photography to professional and amateur photographers. Quarterly, price 3d.; 4to.; 16 pp. in each number (including advertisements); illustrated. Published by W. B. Whittingham and Co., Charterhouse Square and Gracchurch Street.

This is the organ of the Photographic Artists' Stores, of 43, Charterhouse Square, E.C.

(20) *CHEMICAL (THE) GAZETTE*; or journal of practical chemistry in all its applications to pharmacy, arts, and manufactures. Conducted by William Francis and Henry Croft. 8vo.; 17 vols. published. 1842-59.

Continued as—

(20a) *CHEMICAL (THE) NEWS AND JOURNAL OF PHYSICAL SCIENCE*. A journal of practical chemistry in all its applications to pharmacy, arts, and manufactures. Edited by William Crookes. 1860-88+. Weekly. Small 4to. Price 4d. London: 3, Boy Court, Ludgate Hill, E.C.

Thirty years ago Mr. Crookes was one of the first scientific photographers of the day. He has won higher fame as a chemist than could perhaps have been possible to him as a photographer, but he has never forgotten his first love. In the pages of the *Chemical News* many papers and facts bearing upon photography will be found.

(21) *CHEMICAL SOCIETY, JOURNAL OF THE*. Containing the papers read before the Society, and abstracts of chemical papers published in other journals. 1841-88+. 8vo.; monthly. Sent to subscribers for 30s. per annum by the publishers, Gurney and Jackson, 1, Paternoster Row, E.C.

Each number contains about 270 pp., and the abstracts include foreign as well as English publications, giving a complete *resumé* of chemical science. The editor is C. E. Groves, F.R.S.

(22) *CHEMIST (THE)*; or, Reporter of Chemical Discoveries and Improvements, and Protector of the Rights of the Chemist and Chemical Manufacturer. Edited by Charles Watt and John Watt. Six vols.; 8vo. London. 1840-45.

Continued as—

(22a) *CHEMIST (THE)*; or, Reporter of Discoveries and Improvements in Analytical, Manufacturing, and Agricultural Chemistry. Edited by John Higgs Newton. One vol. (vii.); 8vo. London. 1846-48.

Continued as—

(22b) *CHEMIST (THE)*. A monthly journal of chemical philosophy and of chemistry, applied to the arts, manufactures, agriculture, and medicine, and record of pharmacy. Edited by John and Charles Watt. New series. Four vols.; 8vo. 1849-53.

Continued as—

(22c) *CHEMIST (THE)*. A monthly journal of chemical and physical science. Edited by John and Charles Watt. New series. Five vols.; 8vo. 1854-58. London.

It was in *The Chemist* for 1850 and 1851 that Scott-Archer's classical papers on pyrogallie acid and on the collodion process appeared.

(23) *CYCLIST (THE)*, and *Bicycling and Tricycling Trades Review*. Weekly; 4to. 1880-88+. Edited by Henry Sturmev, and published by Iliffe and Son, 12, Smithford Street, Coventry. Price 1d.

The connection between cycling and photography has grown rapidly but steadily, and the ease of conveyance which a machine offers for the carriage of one's kit is un-



deniable. Besides many articles and letters on photography in the ordinary issues, the extra Christmas Nos. of the *Cyclist* (price 1s.) have of late years drawn largely on photography—especially the humorous side of the subject. Mr. Sturney is a devoted "A.P.," and the editor of the very useful "Photographers' Indispensable Handbook." The ordinary No. of the *Cyclist* sometimes runs to 100 large pages, which must be about record for a penny weekly.

## Patent Intelligence.

### Applications for Letters Patent.

907. FREDERICK BARR, 28, Clarendon Road, Walthamstow, for "Improvements in camera stands."—Jan. 20, 1888.  
 949. JOHN EDWARD THORNTON, 3, New Lorne Street, Moss Side, Manchester, for "Flash lights and apparatus connected therewith for photographic and other purposes."—Jan. 21, 1888.  
 1,026. WILLIAM PHILLIPS THOMPSON, 6, Lord Street, Liverpool, for "Improvements in or relating to the production of pictures or images on materials or fabrics having a dark ground by a photo-mechanical process."—(*John William Charles Coven Schirm*, Germany.)—Jan. 23, 1888.  
 1,201. ALFRED JULIUS BOULT, 323, High Holborn, Middlesex, for "Improved photographic plate to be developed in water."—*Leo Backelandt*, Belgium.—Complete Specification.—Jan. 26, 1888.

### Specifications Published.

- 3,998. FELIX JULES CHARY, of 9, Rue de Londres, Paris, in the Republic of France, Photographer, for "An improved apparatus for the application of electric light for photographic purposes."—March 16th, 1887.

The patentee says:—I use apparatus by which a large quantity of light is made available and is diffused with sufficient uniformity, after describing an angle of 45 degrees from a reflector. I use one or more foci of light as may be most advisable in different circumstances.

These foci of light consist of electric "arc" lamps of any effective form of construction. To these lamps I adapt a silver plated concave reflector the depth of which is about one-third of its diameter, for instance, 24 centimetres diameter to 8 centimetres deep, and I arrange this reflector so that the light is at its centre or focus. The reflector is preferably mounted upon adjustable supports, so that it can be inclined backward or forward, and to the right or left.

The claim is:—The method of diffusing the light by double reflectors, that is to say by directing it upon a reflector from which it describes an angle of 45 degrees before falling upon the person or object to be photographed.

## Correspondence.

### DR. VOGEL ON ORTHOCHROMATIC PHOTOGRAPHY.

DEAR SIR,—I notice in your last issue Dr. Vogel's remarks anent my objections to his theory of optical sensitizers. I give his own theory as propounded from his own letter: "Really a ray absorbed by certain dyes in the presence of silver salts acts more vigorously on this salt (*sic*) than not absorbed rays." This says, in other words, that to deprive a ray of part of its energy enables that ray to do more "work"—an assumption which physicists will be slow to accept.

My own explanation—which is not so unorthodox—of the action of dyes on a sensitive film is now some years old, often having been given in lectures and published. It is not confined, as Dr. Vogel's letter almost implies, to the combination of a dye with free silver, but may be summed up as follows:—

1st. If the dye can combine with a salt of silver, the compound may be chemically acted upon by rays to which the original salt of silver is sensitive, and also insensitive.

2nd. A fugitive dye, even if it does not combine with

a silver salt, may be acted upon by rays to which the silver salt is sensitive, and also insensitive. The altered dye may then become a nucleus on which silver reduced from the neighbouring particles of silver salt can be deposited.

I know of no results with dyes which cannot be explained in a manner which is not contrary to accepted physical theories.

As I am preparing to continue my series of articles on this subject which my ill health interrupted last year, I will not enter more fully into the matter.—Yours faithfully,  
 W. DE W. ABNEY.

### TYLAR'S METAL DARK SLIDES.

SIR,—In reply to Mr. Richard Parr's letter in yours of 27th inst., I beg to state the simple circumstances leading up to his extraordinary epistle. My first knowledge of Mr. Parr was on receiving a letter from him dated 9th inst., complaining in a similar strain as the one sent to you, winding up with the following remark: "But it occurs to me that you really re-invented it, and if so I should be sorry to injure your sale; still, it is not pleasant to have one's ideas appropriated, and I suggest that you acknowledge it in some trifling way, say by sending me a half dozen of your quarter-plate dark slides."

Now, sir, I replied to that letter, but did not send the gift of the slides, hence the gentleman who did not wish to injure me has written you.

Mr. Parr is not the first gentleman who has tried to lay claim to this invention; perhaps he will not be the last. Ten years ago I was a youth, and knew nothing of your paper or his inventive genius, which he allowed to remain dormant so long.

I have worked hard, and have improved my own idea, patented and placed the article in a practical way before the public for nearly two years, and if other men have thought out a similar thing without my knowledge, and only theorise, it surely must be jealousy that actuates them to try and extort some gift after I have borne the risk and expense of placing my invention before an exacting public.

In conclusion, I can safely assert that Mr. Parr's description in the *English Mechanic*, which I have referred to in our library, is descriptive of a mere toy, and would be impracticable in large size slides, say 10 by 8 or 12 by 10. I make and stock half-plate slides in nine different widths, from the narrowest wood slides up to 6½ inches wide, to suit the varied makes of cameras, and save delay in fitting; also size up to 12 by 10 inch, and supply them with shutter which can be drawn entirely out if needed, and that without any of the suggested methods of Mr. Parr; further, I use no springs to close the groove, or anything that is likely to get out of order.

I have advertised extensively during the last eighteen months, in several instances with wood cuts, and the entire specifications were duly published in the interested journals, and open to Mr. Parr or any other reader to oppose the granting of same before sealing patent.

I think I have said sufficient to now leave the matter for your readers to discriminate between theory and practice.—Yours truly,  
 WM. TYLAR.

### THE PHOTOGRAPHIC SOCIETY.

DEAR SIR,—In a letter published in your issue of the 13th Jan., Mr. Mackie comes forward as the advocate of a balloting paper in which the names of the nominators are to be excluded. Provisionally the insertion of the nominators' names was passed in the draft of the new laws of the Society, and I hope when the laws are finally passed this provision will remain in, and it will if we have a fair attendance at the next annual meeting. Mr. Mackie seems to think that because a few members of Council nominate the same person, that therefore that individual is certain to be elected. I won't say that is the case, but if so, what then? The members of Council are, as a rule, gentlemen who are well known to the Society, and the



country members, without doubt, are guided in filling up their papers by seeing well-known names as nominators, since they cannot be supposed to know the merits of every individual who is nominated. Take away the nominators' names, and the country members will probably not vote, unless a private list is circulated amongst them by some of these well-known individuals. Unless this course be taken, the election would virtually be left in the hands of the small body of members who live in London, which is not desirable.

A member who nominates another as member of Council does so with a fuller sense of responsibility if he knows his name is to be attached to it, than he does if he is certain his name will remain unknown. Mr. Mackie tells us that the publication of the names of the nominators tends "towards the introduction of the worst electioneering practices." Others who have a very wide experience think their omission would do so. Unless private action were taken to recommend certain candidates to the electors, it is quite within the bounds of possibility that the solid vote of a very few would carry a list which contained by no means the men best fitted for the Council. The probable distribution of the votes of the majority amongst many nominees would ensure the success of these tactics, a result which would be deplorable, and probably ruinous to the Society.—Yours faithfully,  
W. DE W. ARNEY.

#### ARTISTIC PORTRAITS.

SIR,—To-day, looking, as I often do, at Debenham's matchless portrait of Mr. Fred Barnard, I am led to wonder whether painters generally estimate at its value the power they have of getting costume portraits of themselves or their friends from such an artistic photographer as is Mr. Debenham. I say painters, but the word is intended to apply to all those who not only pursue art as a profession, but also those who by training or instinct are artists.

Fancy the handsome head and figure of Sir F. Leighton in the gay costume of Charles I. period, or Sir Everard Millias in that of the Eighth Harry or earlier. As photographs, what pictures they would be—how easily obtained; and, as they would represent the actual men, of not merely domestic, but of national value.

The persons I have indicated, knowing themselves, would design their own dress characteristics. Costume, even to those who would not purchase, is easily obtained in London, and the whole thing is of the simplest attainment. The result would repay a thousand times any slight trouble attendant upon it.

Melton Mowbray.

WILLIAM ADCOCK.

#### THE OPTICAL LANTERN.

SIR,—Having read Mr. W. H. Harrison's historical notes on the optical lantern, and also Mr. Dixon's reply to the same, I should like to write a few words.

In the main I agree with both Mr. Harrison and Mr. Dixon, and in support of the former I would think the hand painters, pure and simple, can be counted on the fingers, thus practically supporting Mr. H.'s statement. When it is considered, on the other hand, what a number of artists there are that colour lantern photos.

Hand painters have painted slides and sold them as original designs, when they have been copies of well-known engravings. On the other hand, if the engraving is photographed and coloured, no deception can be practised; but if the hand painter does not use photography, he still has mechanical means to effect the required ends.

With regard to the contemptuous remark by Mr. Dixon as "to the tinting the photo," I would remind him that the photos are coloured for a stated price, and of course the quality has to be considered with the remuneration; I

suppose no hand painter would put as much work in a slide for 1s. as he would for £1.

Personally, I have painted photos for firms named by Mr. Dixon for upwards of sixteen years, which fact speaks for itself; and I have good reasons for knowing or believing that hand painters cannot get a living by hand painting only, but do largely colour photos.

P. L. TURNER.

35, Princes Square, Kennington, S.E. Jan. 30.

### Proceedings of Societies.

#### THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE usual weekly meeting was held on the 26th ult., A. COWAN in the chair.

The adjourned discussion on W. H. Harrison's paper, "Historical Notes on the Lantern," read before the Society on the 15th December, was resumed.

W. H. HARRISON was of opinion that increased illumination of the lantern picture might be obtained by using a lens between the ordinary condensers and the illuminant.

F. A. BRIDGE replied that a similar plan was employed at the Polytechnic at the time when lantern exhibitions were among the principal attractions of that place. It was, however, ultimately abandoned. He did not think any advantage was gained by using large condensers beyond a 4½ inch.

J. FRESHWATER agreed with this, except in cases where pictures above the ordinary 3½ square were required. The addition of an extra lens would shorten the focus of the condensers, and the light would have to be brought closer.

F. H. BERRY remarked upon the risk in having the light in too close proximity to the condensers. He remembered an instance of a 12 in. condenser being split in two from this cause during a theatrical performance.

W. H. HARRISON thought an iris diaphragm used in front of the projecting lens would be a gain, as tending to give a sharper image. He gave preference to longer focus projecting lenses than those generally used. He was not sure that the present optical lantern was yet a scientific instrument.

J. FRESHWATER suggested the diaphragm being placed between the lenses.

L. MEDLANN asked if the kaleidoscope could be used in conjunction with the lantern.

The HON. SECRETARY replied that one of their members, Charles Darker, had on more than one occasion exhibited his lantern kaleidoscope before the Society.

NORMAN MACBETH, referring to coloured slides, remarked that at the last lantern meeting, when some old hand-painted transparencies were shown, he noted many points of interest in connection with these slides—the pleasure of the application of the colour, and the many beautiful effects that could be brought out by a little skill with proper pigments.

W. BEDFORD said it was a matter of some surprise to him that so little had been done in this direction by amateurs at the present day—a drawback possibly was the colour of the photographic basis.

NORMAN MACBETH had tried, but could not wholly get rid of the colour. The more neutral the colour of the film worked upon, the better. A great deal, however, depended upon the subject. Landscapes were improved by a sepia basis in the foreground, but it was necessary that the distance should be neutral.

F. A. BRIDGE remarked upon the difficulty to the painter caused by the small size of the usual lantern transparency. At the old Polytechnic they used 7 by 5 transparencies splendidly hand-painted. He did not believe that really good work could be done upon a smaller size.

After some further discussion on this subject, it was decided that at the next lantern night, the 23rd inst., an exhibition of hand-painted slides should be given.

The capabilities of an ordinary metal beetle powder diffused for flashing magnesium powder, was demonstrated by G. D. PLOMER, using a 5 gr. charge, and forcing it through a small spirit lamp flame.

F. A. BRIDGE also exhibited a simple apparatus for the same purpose. It consists of a bent glass thistle tube, costing twopence, to which was attached a pneumatic ball and india-rubber tube.



H. M. HASTINGS had still further simplified the apparatus shown by him the previous week for flashing pyrotechnic powder—by converting it from a breach to a muzzle loader. This was effected by simply twisting the glass tube or barrel into a small circle in the centre of its length, in which the charge rested.

W. H. HARRISON referred to the danger to the eyes of the operator from the sudden flashing of such an intense light.

It was generally thought that a pair of neutral tint glasses would sufficiently protect the eyes.

This being the ordinary lantern night, the remainder of the evening was taken up with the optical lantern. Transparencies were exhibited by J. Joel, P. Everitt, L. Medlaud, H. D. Atkinson, and W. England.

On the 9th inst. a paper will be read by D. Louis, F.C.S., on Silver and its Salts."

#### YORKSHIRE COLLEGE PHOTOGRAPHIC CLUB.

THE third annual exhibition of lantern slides took place on Friday evening last, the 27th inst., in the Chemistry Lecture Theatre, before a large audience of members and friends.

One hundred and fifty slides were shown, the contributors being Miss B. Boyle, Messrs. C. H. Bothamley (President), J. B. Crossley, H. B. Hall (Hon. Secretary), and H. Ingle, Dr. E. H. Jacob, and Messrs. A. E. Nichols, H. Pocklington, and W. Thomas. The subjects included landscapes from various parts of England, Wales, Scotland, and Ireland; figure subjects, including several instantaneous studies; portraits by the magnesium flash light; and examples of orthochromatic photography as applied to flowers and landscapes.

The next meeting, on February 23rd, is devoted to a discussion on "Instantaneous Photography."

The exhibition announced for February 14th is postponed until after Easter.

#### PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

At the Committee meeting on January 26th, the minutes of the previous meeting having been read and confirmed, the Committee were occupied with an application for assistance. The particulars of the case being somewhat complicated, a temporary grant was made, and the matter deferred for further consideration. A resolution was passed that all local secretaries should be *ex-officio* members of the Committee.

#### CAMERA CLUB.

ON Thursday, January 26, A. PRINGLE delivered a lecture entitled "A Tour through Southern Spain, and a Day in Tangiers." W. A. GREENE occupied the chair.

This was a lantern evening, and Mr. Pringle's lecture was illustrated by pictures on the screen from slides, mostly of his own preparation, some being lent by Mr. York. Interesting views of Gibraltar were shown, and the narrative of the touring party's experiences through Andalusia bristled with lively sallies of wit. The transparencies, showing interiors in the Alhambra, were especially admired. The lecture was numerously attended, and a very hearty vote of thanks was passed to Mr. Pringle for his excellent entertainment.

The tour taken by Mr. Pringle and his party commenced at Gibraltar, where they appear to have found a good guide (Michael Benunes), but not much photography. Some distance off, near Algeiras, an interesting picture of a Moorish bridge—the Bridge of Thunder—was secured. This was shown upon the screen. At Cadiz, the chief photographic experience was the discovery of a smashed changing-box. However, the "Miradores," or towers, afforded fine views. Some interesting particulars concerning Seville came next in the lecture, the Giralda—a lofty tower close to the Cathedral—the Cathedral itself, and the Alcazar being the chief points noted for observation. Here Mr. Pringle was led by his experiences to be very sceptical of the powers of the famous bull-fighters, his opinion being that he would rather be a bull-fighter than a jockey, as far as the danger of the life was concerned. The principal part of the lecture was devoted to a narrative of the party's experiences in Granada amongst the beauties of the Alhambra. The lantern slides illustrating this portion of the lecture were particularly fine.

The subject on Thursday, February 9, will be "Photographing by Artificial Light," discussion to be opened by J. F. Roberts. Meeting at 8 p.m.

#### BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE ordinary meeting was held in the Technical Schools, Bridge Street, on Jan. 26th, E. H. JAKES (Vice-President) in the chair.

W. H. Blunfield, A. E. Hart, G. Wilkes, and H. J. Stamps were elected members, and J. Biggs, H. J. Avery, Thos. North, and Geo. Whealc were nominated for election.

The Hon. Sec. then read a letter from the Stereoscopic Co. offering a medal for competition prize, which was referred to the Council for consideration.

Carbon prints on opal were exhibited by G. Baxter, and Vergara film negatives and stereoscopic lantern slides by W. Osborn.

The question box contained:—"Can carbon prints on opal be made insoluble to prevent damp spoiling them or getting dirty?"

A. A. NOCK: Use copal varnish, but it detracts from the beauty of the pictures by making them glossy instead of dead.

A. CONSTANTINE recommended cristoline.

GEO. A. THOMASON: Cristoline can also be used on negatives.

The CHAIRMAN remarked that the carbon process was now being employed for the decoration of furniture, &c.

The Hon. Sec. handed in a fine water-colour painting received from W. P. H. Foster, who had promised it as a prize at the recent competition, but had been unable to finish it before, owing to continued ill-health. The painting was much admired, and the Chairman handed the same to W. D. Welford, the winner of the prize.

The CHAIRMAN then said that, on behalf of the Society, he had a very pleasant duty to perform—viz., to present Mr. Karleese, their late Hon. Secretary, with an album filled with specimens of the members' work during the past three years, as a small acknowledgment of his services. At the time of his appointment, the Society was, comparatively speaking, young, lacking unity and method. During his period of office it had, under his supervision and care, been steadily developed, until it had become the prosperous body it is now. Members could scarcely form a correct estimate of the work falling to their Hon. Secretaries without being in frequent intercourse with them, and from his personal knowledge of the way Mr. Karleese had always acquitted himself, he was sure none better appreciated his services, or more regretted his resignation, than he (the Chairman) did himself.

In accepting the presentation album, Mr. Karleese said:—"You will, I am sure, excuse me if my words are few in tendering you my sincere thanks for the honour you have so generously conferred upon me this evening in the presentation of this handsome album, for I feel far more than I can express. When the matter was first mentioned to me, I was surprised, and expressed a desire that you would abandon your intentions; but your committee assured me this could not be entertained. I felt then, and do now, that whatever services I have been able to render, were rendered from a feeling of duty to you, enhanced by a genuine love of our art. The cause of my resignation was a source of great anxiety to me; but however much regret I felt, there was no alternative but to consider my health paramount to all else. It is with no slight feelings of pride I find to-night the efforts of others and myself in the early days of the Society have borne fruit in making its membership roll nearly three times that it was at the period referred to by our Chairman. I shall always cherish this album, not for its intrinsic value, but for the kindly thoughts and feelings it conveys, and as a work of art, the contents of which I shall endeavour to emulate, and, if possible, surpass. Again I thank you very sincerely for this mark of your favour, and hope the day will be far distant when the Birmingham Photographic Society will cease to exist, or that my name will disappear from its membership roll."

A. A. NOCK then gave his paper on "Wet Collodion" process for lantern and other transparencies, with a practical demonstration of the same, showing the causes of failure, and the way to succeed in obtaining good pictures; also bath wet collodion was the best method for lime subject, and the case with which they can be made. In answer to enquiries he said: "One should never tone lantern slides with mercury, as they are apt to fade, &c." "If the collodion gets dry it can be wetted again." "He did not tone his slides, but intensified till sufficient depth had been obtained." "It was necessary to varnish the plate before mounting, because of the deposit of silver." "Can be dried by heat."

The CHAIRMAN remarked to the members that they must do wet collodion pictures in a room where ammonia fumes are unknown.

WILLIAM TYLAR next proceeded with "Double Contact Printing for Lantern Slides," and unfolded the secrets of print-



g-in the clouds, &c., by double contact, rendering much practical information, going through every detail, and producing some excellent slides and transparencies. Mr. Tylar uses his developing dishes and plates holders which are now so well known, and for compactness and handiness cannot be excelled. The CHAIRMAN said the lateness of the hour would prevent any discussion, and thanking Messrs Nock and Tylar for their valuable information, &c., which the members he was sure much appreciated, declared the meeting at an end.

#### PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

THE twenty-sixth annual meeting of the Society was held on Jan. 4th, with the President, FREDERIC GRAFF, in the chair.

The Secretary called attention to a circular received from the Dundee and East of Scotland Photographic Association, announcing an Exhibition to be opened on February 16th. A circular was also read announcing that the second annual exhibition of the combined work of the Photographic Society of Philadelphia, the Society of Amateur Photographers of New York, and the Boston Camera Club, would be held in Boston, in March next, under the auspices of the latter Society. Members were urged to prepare exhibits which would worthily represent the Society, and to have them ready for forwarding by the date which would duly be announced in a future circular containing rules, &c.

The annual report of the Treasurer was presented, and showed satisfactory financial condition of the Society.

The Executive Committee presented their annual report, from which the following extracts are made:—

"The Photographic Society of Philadelphia may well look back upon the year just closed as one of marked success. The membership has increased to 152, and in consequence of the constant growth, the present accommodation of the Society has become insufficient for the attendance at meetings. The agreement entered into with the Boston Camera Club and the Society of Amateur Photographers of New York, relative to holding joint exhibitions, was successfully inaugurated by the exhibition held in New York during the spring, to be followed this year by one at Boston, for which your Committee hope the members will make early preparations to insure our proper representation. The Society, also, having joined the Lantern Interchange, the display of slides collected by the various societies associated in it, promises to give interest to our conversational meetings during the winter and spring months. During the year the attention of the Society has been given to the use of magnesium powder, for instantaneous photography at night, to hydroquinone as a developer for negatives and positives, to the transfer of films developed upon paper to glass, muslin, wood, porcelain, &c., to the production of negatives and positives by heat rays alone through the medium of luminous paint, to the more extensive employment of stripping films and isochromatic plates, to the fallacy of so-called "composite photographs," and to the use of the electric light in the optical lantern.

At the election for officers and committee for 1888, Frederick Graff was re-elected President, 1st Vice-President—John G. Alcock. 2nd Vice-President—Jos. H. Burroughs. Secretary—Albert S. Redfield. Treasurer—S. Fisher Corlies, and in acknowledgment of his re-election to office, made an address from which the following is extracted:—

"It is gratifying to feel assured of our continued prosperity, of our increased number of members, of the excellent work produced by our ardent, interested, intelligent workers; in the beautiful, and yearly becoming more and more wonderful pursuit, which engrosses all, and gives name to our society. Before a membership so generally well informed on all that pertains to photography, and with the advantages furnished by our excellent special library, it would be a work of supererogation should attempt to recapitulate the important new processes or improvements brought forth during the past year. Constant improvement is being effected in the quality, facility of making, and consequent cheapness of reproductions of photographs for book illustration. And as an adjunct, isochromatic methods have claimed much attention, their application being of such obvious advantage in producing properly balanced copies of highly coloured paintings; for the reproduction in permanent inks of the art work. I cannot pass on without reference to the fact of the society having so pleasantly celebrated the twenty-fifth anniversary of its organization. Much may be said of the want of stability in silver prints and other such work in which we excel, but the claim of want of stability certainly cannot be urged against a society that occupied for its abode and meet-

ings the same room for a period of twenty-two consecutive years; and is fortunate enough to retain and re-elect this evening for the twenty-sixth time its worthy Treasurer, who has faithfully watched over its finances for so many years. On the festive occasion referred to, I had the pleasure to welcome a number of those who with myself were present at the first meeting for organization. It is good testimony of the attractiveness of our work, to be able to say that I found them still, after twenty-five years, as ardent and enthusiastic in pursuit of the enjoyments and wonders of our art as in by-gone days." The plan inaugurated during the year of having an exhibition of the pictures of our members in our own room, from which to select the "presentation prints," is a good one, and I hope will be continued with additional contributors.

A paper was read by ROBERT S. REDFIELD, on "Preparing Photographs for Exhibition." (See page 67).

JOHN C. BROWNE called attention to the new Welsbach incandescent gaslight as likely to have valuable uses in photography. He briefly described the light as being produced by a tubular piece of woven fabric about two inches long, which was treated with certain chemical substances, and afterwards baked so as to practically destroy the fabric itself. The tubular "mantle," as it is then called, is suspended within a glass chimney by means of platinum wire over a Bunsen burner. At a low gas pressure sufficient heat is generated to produce an intense white incandescence in the mantle similar to electric light. Where such a white light is objectionable the colour may be modified by the use of suitable chemicals in preparing the mantle. A powerful company is now preparing the burners for the market, and they will probably soon be offered for sale.

WILLIAM BELL proposed a method of treatment for lantern slides on gelatine plates as follows:—For contact slides on Carbutt's A or B plates, commence developing with an old filtered ferrous-oxalate developer, prepared as for Eastman's bromide paper, adding a little freshly mixed developer from time to time. The formula consists of:—

a.—Potassium oxalate...	...	...	1 pound
Hot water ...	...	...	3 pints
b.—Iron proto-sulphate ...	...	...	1 pound
Hot water ...	...	...	1 quart
Citric acid ...	...	...	$\frac{1}{4}$ ounce
c.—Potassium bromide ...	...	...	1 ounce
Water ...	...	...	1 quart

Mix one day before use—4 ounces a, 1 ounce b, and 30 drops c. The best results are obtained with developer one month old adding a little freshly made, as above stated. After use bottle, and filter before again using. Develop until the highest light begins to colour, wash, fix well, and wash, until all hypo is out of the film. If this latter washing is not thorough, the slide will be ruined in the next operation. The slide is then immersed in the following solution:—

Mercury bi-chloride...	...	...	1 ounce
Ammonium chloride ...	...	...	1 "
Water ...	...	...	10 ounces

Dissolve and add 15 grains chloride of gold. For very weak positives, the full strength can be used. For very weak positives the full strength can be used. For stronger ones dilute to one-half. When whitened by this solution wash well and flow with:—

Water ...	...	...	10 ounces
Liq. Ammonia ...	...	...	1 to 2 ounces

which will blacken it again, producing proper intensity and a desirable tone. If the positive has had too short exposure to the light, the above will make it too black and white. Correct exposure only will give harmonious results.

Mr. CARBUTT referred to a statement made in a recent number of *Anthony's Bulletin*, by Henry J. Newton, to the effect that the slow gelatine plates usually recommended for lantern slides were not the best for the purpose. To obtain softness and atmospheric effect, he thought quicker plates were required. Mr. Carbutt thought that with the ordinary run of negatives, quick plates would cause a great percentage of loss. Acting on the requirements of the majority of slide makers, he was now making his plates for this purpose even slower than heretofore. To make a good slide on a quick plate, a good strong negative was necessary. With a weak negative the slide would lack brilliancy.

Mr. BELL corroborated Mr. Carbutt in this opinion, as did also Mr. BROWNE, who stated that in his experience the best



slides were made by the albumen process, which was a very slow one. Next to albumen he would rank washed emulsion, then the wet process, and last gelatine.

Dr. WALLACE thought that with the wet process, a strong negative would produce the best results, while a thinner one would be more suitable for albumen.

As to which was best for gelatine, Mr. CARBUTT recommended one of medium strength, stating also, in reply to S. M. Fox, that with a thin and a dense negative, providing detail and gradation of light and shade were equal in both, equally good results could be obtained in gelatine.

Mr. BARTLETT showed a number of excellent pictures made by the light of "Blitz-Pulver," prepared for T. H. McCollin and Co. The powder as now made produces even less smoke than heretofore, and the proportion of the ingredients had been so carefully determined as to give a maximum of actinic light with the least possible quantity of material. 10 grains was sufficient for a portrait exposure, when the source of light was less distant than 5 feet, but if ground glass was used in front of the light double quantity should be used.

Several members related their experience in making flash-light pictures, the general opinion being that the quantity of material used should not be stinted.

Mr. FASSETT showed a picture of a party at dinner, which was completely successful, and in which five or six times the usual quantity of power had been used.

## Talk in the Studio.

**THE JENNINGS FUND.**—The following has been received from the Treasurers:—On closing the Jennings fund, Messrs. Maddox and Pringle beg to submit the following statement, and express their thanks, on behalf of the widow, to the Editors and contributors for their kind assistance:—

Dr. Maddox and Pringle in a/c with the Jennings Fund. Cr.			1887-8.			1887-8.		
To cash anonymous	£50	0	0	By cash advances...	£12	12	0	
" " "	1	13	6	Rent to Xmas '87...	3	5	0	
" Contributions ...	29	13	9	Debts ...	...	15	0	0
" Microscope, &c.,	}	21	0	1 year's rent and	}	21	0	0
sold				taxes in advance				
				Removal of furni-	}	3	9	0
				ture & probate, &c.				
				Cash advance Jan.	2	1	6	
				Investment for child	20	0	0	
						77	7	6
				Balance with Dr. M.	24	19	9	
£102 7 3				£102 7 3				

Jan. 28, 1888. Balance for monthly advances held by Dr. M., £24 19s. 9d.

"PRACTICAL AMATEUR PHOTOGRAPHY."—This is the title of a useful little hand-book which is written and published by C. C. Vevers, of Horsforth, Leeds, and is sold at sixpence. The second edition is before us, and is brought well up to the present time.

**PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.**—The next Technical Meeting will be held at the Gallery, 5A, Pall Mall East, on Tuesday, February 14th, and there will be a demonstration by E. Howard Farmer and W. K. Tompkins of their process for obtaining prints by development similar to those on albumenized paper.

**A DERBYSHIRE PLATINOTYPE BY C. BOURDIN (PHOTOGRAPHER) AND R. KEENE (PRINTER).**—It is a view of the Lovers' Walks, Matlock Baths, and forms the presentation print of the Derby Photographic Society. It is a picture which the most fastidious might hang in the room which he most frequents; and which a photographer might proudly show to an artist as an example of what can be constructed by the aid of the camera.

**MARION AND CO.'S ARRANGEMENT FOR THE FLASH-LIGHT.**—This firm is now supplying a convenient flash-light arrangement over which Professor Redwood makes a patent claim. It consists of a sort of double spirit lamp with large wicks inclined towards each other, and near the root of each spirit burner is a tube through which the magnesium powder is ejected by means of a pneumatic ball similar to that used for shutters, but somewhat larger. An adjustable tin reflector lined with white blotting board is used behind the light. We have not tried the apparatus,

but the maker informs us that the light is so actinic that with 15 grains of powder, a cabinet lens, medium stop, gives, if anything, an over-exposed plate.

**PHOTOGRAPHIC CLUB.**—The subject for discussion on February 8th will be "The Completion of Photographic Pictures." This will be an exhibition meeting, at which the work of members during the past year will be shown. Photographs should be delivered by 4 o'clock on that day, or during the previous week. A short paper will be read on finishing photographs, by Mr. Dunmore.

## To Correspondents.

\* \* \* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C. 1;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C. 1."

G. HUDSON.—It has been used, but with a less satisfactory result than the various pyrotechnical lights. Try the magnesium flash light.

W. G. FOTHERGILL.—We are personally acquainted with your correspondent, and feel much surprised at his action in the matter; and it appears to us quite indefensible if he has anything of the value of which he can dispose. In the face of his letter you would probably obtain from the County Court an order for immediate payment, unless he could prove himself to have nothing equal in value to the amount claimed.

WALTER E. SAWYER.—It is remarkably successful, and of considerable interest. The best of these we have previously seen is one showing some houses in New York, and which appeared in the News a few years ago.

W. A. WATTS.—We are much obliged for your note and enclosure.

W. H. LAWSON.—1. The best roller is a lithographer's leather roller in good condition; that is to say, very thoroughly impregnated with ink, but carrying very little in amount. The lithographer "prepares" his roller by repeated saturations with ink, the "preparation" often extending over several months. 2. Litho chalk ink is the best thing to use. Do not thin it for the first trial, but well distribute a very small quantity by long and patient rolling. 3. Slow rolling with heavy pressure tends to load the plate with much ink, while quick rolling with light pressure will put less on—and, indeed, will often take some off. 4. Nothing special is required, but the negatives should be reversed. The flatness of your print may be from one or several of the following causes:—a. Thin or flat negative. b. Over-exposure of the plate. c. Exposure of the plate to fumes of gas or other insubstantialising agency. d. Very slow drying, or storing plate in damp place or condition. e. Plate too dry when inked up. f. Bichromate not thoroughly washed out. g. Ink too thin. Write again in case of further difficulty.

Q. E.—1. It is very good indeed. 2. As two rinsings in water are sufficient at this stage, we do not think it would be worth while to make use of any sort of automatic washer for these preliminary washings. The first given in the YEAR-BOOK is that which we have found best for general work. 3. Not so good, in our opinion. 4. Single.

F. H. DYMONN.—1. By chance you may get a good one, but in the case of the makers you mention you pay extra for the certainty of having a good instrument. 2. Quite right in selecting these. 3. To speak candidly, we cannot recommend one which does all this, and at the same time is cheap. Go and see those offered by the London dealers, and try and effect a compromise between the conditions you desire and the price. 4. The large inkers are about equal in merit. Try several, and use those which suit you personally.

TEIGNBRIDGE.—Fraudulent photographers sometimes sell photographs taken on white glass as pictures on porcelain, or as "porcelains." Perhaps these are what you have seen.

AMATEUR.—c.c. means cubic centimetres, or "centimeters," as we think it is spelled in the Act of Parliament, which makes it a legal standard of measure in England. See the tables in "Whittaker's Almanac" or in the YEAR-BOOK.

RUIS.—We expect you can obtain them from Marion, of Soho Square.

B. J. EDWARDS and Co.—The first paragraph in your letter in no sense bears on the discussion of the subject, but is a personal imputation outside legitimate discussion, and would be ruled out of order by any efficient chairman at a public meeting. We will insert your letter if you authorize us to leave out this paragraph.

MICRO.—1. We cannot undertake to search through the patent records for the exact date, but the patent has long since expired. 2. No; the ordinary instruments answer well, but sometimes a correction for actinic focus is needed. See Jennings on "Photo-Micrography," price one shilling, published by Piper and Carter.

\* \* \* Several answers stand over.



# THE PHOTOGRAPHIC NEWS.



Vol. XXXII. No. 1536.—February 10, 1888.

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### A PHOTO-LITHOGRAPHIC REPRODUCTION OF BURNET'S ESSAYS ON ART.\*

PERHAPS one of the most interesting and valuable works we have received for a long time is the latest contribution from the photographic publishing house of Edward L. Wilson, 853, Broadway, New York—nothing less than an exact photo-lithographic reproduction of Burnet's famous art essays; a series of essays which has been a standard for about half a century. The original set of essays, from which the reproduction has been made, was published by Carpenter, of Old Bond Street, at a price of £2 18s., and Mr. Wilson's copy—used as an original—was bought in London for £9 in 1873.

Every photographer who wishes to educate himself in art principles should avail himself of the present opportunity of obtaining this fine book for so small a sum as the published price, and we take it that the most convenient way for our readers to get the work will be to order it through a foreign bookseller, as, for example, Trubner, of Ludgate Hill.

The value and importance of the book will be partly illustrated by giving a list of the illustrations.

Plate I.—*Angular Composition*.—Fig. 1 shows rectangle, crossed by diagonal lines, used by Cuypp; 2, doubling of the lines on clouds, by Cuypp; 3 and 4, sky backgrounds, with cows in foreground, by Potter; 5, domestic group, by Ostade; 6, country scene, by Claude.

Plate II.—*Angular Composition*.—Fig. 1, angel in foreground, group of cattle beyond, with trees, by Claude; 2, river-bank view, by Rubens; 3, huntsman going out in the morning, by DeLaer; 4, embarkation of Prince of Orange, by Cuypp.

Plate III.—*Angular Composition*.—Fig. 1, group of heads in form of diamond, by J. Burnet; 2, home comforts, by Ostade; 3, English pastimes, by J. Burnet; 4, gambler's quarrel, by Terburg; 5, hunter's return, by DeLaer; 6, lady writing, by Metzcu; 7, the drunken father, by Rembrandt.

Plate IV.—*Angular Composition*.—Fig. 1, awaiting orders, by Terburg; 2, "School is out," by Ostade; 3, Italian shepherdess, by DeLaer; 4, seducing the God Bacchus, by Rubens; 5, the "Firstborn," by Corregio.

Plate V.—*Circular Composition*.—Fig. 1, death of Ananias, by Raphael; 2, Magdalen and St. Jerome, with child Jesus, by Corregio; 3, doctors consulting the law, by Guido.

Plate VI.—*Circular Composition*.—Fig. 1, a country dance, by Rubens; 2, Death of Gen. Wolfe, by B. West; 3, Christ preaching, by Rembrandt; 4, death of St. Jerome, by Domenichino; 5, transfiguration, by Raphael.

Plate VII.—*Model Compositions*.—Fig. 1, Christ and his disciples, by Raphael; 2, the sick bed, by Rembrandt.

Plate VIII.—*Model Compositions*.—Fig. 1, "Landing of

Charles II.," by West; 2, cattle returning home in a shower, by Burnet; 3, cattle at rest, by Burnet.

Plate IX.—*Model Compositions*.—Fig. 1, blind fiddler, by Wilkie; 2, salutation of the virgin, by Rembrandt; 3, a dance, by Ostade.

Our readers will be interested in the following letter of a well-known English photographer, which is quoted in a pamphlet issued by Mr. Wilson:—

To Edward L. Wilson, Editor *Philadelphia Photographer*.  
I am glad to see you are publishing reproductions of Burnet's "Essays on Art." If photographers really cared for art—which I sometimes doubt—and knew the value of these books, you would sell a large edition. I remember well as a boy, long before I had thought of photography, saving up my pocket money to buy one of these, at that time, expensive books. I chose the one on composition, that admirable essay which, with its illustrations, is so clear and convincing, I have always looked upon as the very solid foundation of all I may know of art. The other essays I have read and admired, but never possessed, for by the time I could afford to buy them they were out of print and difficult to obtain. I strongly recommend these books to all who want to know what is really sound in art.—H. P. ROBINSON.

We cordially hope that the enterprise of the publisher of the reproduced edition of Burnet will be rewarded by a large sale, and an increase of the reputation he has already gained as a publisher of literature useful to the photographic fraternity.

### PICTURES IN THE BRAIN.

#### A PHOTO-PHYSIOLOGICAL THEORY.

GEO. G. ROCKWOOD sends the following to the New York *Tribune* in a spirit of that cautious doubt which the wonders of modern investigation have taught men to exercise. Who will first grasp the "germ" of truth in this matter—if, indeed, such germ exists?

Several years ago the scientific world was startled by the result of a series of experiments made to test the theory that for a brief interval the eye retains upon its retina the last object on which it rested in life—in other words, that a species of photograph is made upon that organ, which, if quickly examined with a magnifying lens, may be plainly identified. It was alleged that an assassin had been convicted in France on the strength of the evidence thus obtained, the image of the murderer having been found impressed upon the eye of his victim while the latter was in the act of being struck down by the murderer's weapon.

Owing to the many impediments in the way of killing people for the mere purpose of adding to the store of human knowledge, but little advance has been made in the development of this curious thought, and until someone unselfishly volunteers to be experimented upon for the benefit of science, it is not likely that much progress will be made in such a difficult field of research.

Some fifteen years ago, while occupying my old establishment

\* "Practical Essays on Art," by John Burnet. 1. Composition. 2. Light and Shade. 3. The Education of the Eye. Reproduced entirely by photo-lithography by the Photogravure Co., of New York. Arranged and edited by Edward L. Wilson. Price 4 dollars (about 16s. 6d.) New York, 1883, published by the editor at No. 853, Broadway.



on Broadway, I frequently observed a gentleman, apparently fifty-five or sixty years of age, with a tall, erect figure, and a distinguished air. His features were regular and strikingly handsome, and he wore a flowing beard that once had been black, but now was beginning to show the frost of time. Evidently he was a foreigner, and I judged him to be a man of noble birth and high culture. His movements were full of dignity, while his face showed the resigned expression of one who had suffered either from a blighted ambition or a hopeless love.

As he always walked alone, seemingly buried in reflection, I could contrive no plan of "getting at him," so to speak, until one day he stopped for a moment in front of an excavation that was being made in front of the old Roosevelt property on the corner of Fourteenth Street and Broadway, now the site of the Domestic Building. I happened to be passing at the time, and also paused in order to more closely observe the mysterious stranger. At this juncture an acquaintance tapped me on the shoulder and said, "Why, Rockwood, you seem to be very much interested in the old Count yonder—do you know him?" "No, I do not," I replied, "and was just wondering who and what he is." "Well, join me at lunch and I will tell you; it's rather an interesting story." It being an idle hour with me, I accepted my friend's invitation, and he then related these curious particulars.

The Count Borenski was formerly a professor of languages in the College of Arts and Sciences in Munich. At an early age he developed a marvellous gift in the acquisition of languages, and before he was thirty-five had successfully supplemented the discoveries and labours of Champolion in the interpretation of many of the ancient hieroglyphics and symbols that had previously baffled the skill of the great students of philology. But, as is sometimes the fate even of the most practical and scientific men, the Count met and fell in love with a young German girl. He proposed marriage, but was refused by the parents on the ground that as the father and brothers of the maiden were soldiers, and had been so for generations, her road to Hymen must likewise be "the path of glory." In short, she must wed only a soldier. In hot blood the Count wrote a letter to the father which so incensed the family that one of the sons replied with a challenge. A duel resulted, and the eldest brother of the girl was left dead on the field, or severely wounded. The Count resigned his professorship, abandoned the scene of his literary work, and came to the United States, where he lives upon a moderate income from an estate left him in his native land, and he is now devoting himself to the study of Egyptology. Such was my friend's story.

Of course I became more interested than ever in my "Broadway character." After a while I noticed that the Count began to show the ravages of time. He was losing his erect and elastic step, and as recently as three years ago it was painful to observe how old age had fairly overtaken him and he had become decrepit, and with bent form and locks grown white and long he tottered by on his daily walk, bearing his weight upon a staff. After this I saw him rarely, and finally not at all. In the thronging events of New York life one has little time to linger on the past, and too often we disregard the future. However, that's an aside.

My hero and his history passed from mind until a short time ago, when I was sent for by Professor Black, of the Bellevue Hospital for aged men, on Manhattan Boulevard. "Come in person," he wrote, "as I have a case in which you will probably be interested." On reaching the dormitory of which the Professor had charge, I was surprised to learn that my missing friend, the Count, had just passed away. The doctor knew but little of his history, and desired to send a photograph to his surviving relatives as collateral evidence of his death. After the negatives were made the doctor remarked that such singular complications had manifested themselves during the illness of the Count, especially in the cerebral region, that he proposed to hold an autopsy, and at his invitation I remained.

The brain has always been to me the most interesting organ of the human body, and this I thought would be a good opportunity to observe whether a life devoted to study would in any way affect its material or structure. I felt sure there must be such a thing as growth, and I knew of many instances in which the brain or portions of it had been increased in size by culture. Besides, an examination in the present case might determine something for or against the theories of the phrenologists.

In order that the face should not appear disfigured at the funeral, an incision was begun at a point immediately posterior to the superior angle of the auricle, and carried directly over

the vertex to a similar point on the opposite side. The scalp was then deflected to the supra-orbital arches anteriorly, and to the occipital protuberance posteriorly. The skull-cap was removed by sawing through the external table, beginning the section in front, about an inch above margin of the orbit, and extending it behind to a level with the occipital protuberance. The internal table was then broken with a chisel and hammer, and the skull-cap pried off. The cranial nerves and spinal cord were then severed, and the brain removed with its three investing membranes, viz., the dura mater, arachnoid, and pia mater. There was something peculiar in the appearance of the dura mater. The sac of the arachnoid contained a little bloody serum. The pia mater was normal. On removing these the surface of the brain proper was exposed. The general appearance of the cerebrum was likewise normal, the convolutions not being remarkable except at one point. The inferior portion of the ascending frontal convolution of the left side was very prominent, bulging in such a manner as to form a decided protuberance. Advanced physiologists allege that the controlling centre of speech is located in part, if not wholly, at this point; and it has been demonstrated by Dax, Broca, Ferrier, and others, that it is this portion of the brain, if any, which governs the faculty of speech. This part, when pressed upon by a tumor or subjected to violence, causes aphasia, or the prevention or perversion of the articulate language. On opening the brain it was found that the projection was caused entirely by an increase in the gray or vesicular matter, which was much thickened at this point. The rest of the cerebrum was normal in every particular.

The cerebrum is composed of two materials, a white substance or conducting material, and a gray substance which is supposed to be the seat of reason and thought. The gray material is on the outside like a shell; hence it is the cortical portion. Its thickness would indicate unusual activity of language. It is composed of cells. Some are spherical, other with one process are called unipolar; those with two processes are called bipolar, and those with three tripolar, while other, with an indefinite number, processes are called multipolar.

In the rest of the brain, these cells seen under the microscopy were perfectly normal, but in this one locality they were curiously distorted. At my request, the doctor gave me a portion of the substance, which I immediately froze. Subsequently, with a fine razor, I successfully planed off a number of thin laminae for microscopic examination. The instrument used was the one I had recently secured from Dr. J. W. S. Arnold, the distinguished microscopist, and with which he had made a large number of excellent photo-micrographs. Several scientific experts joined me in the examination of the portions of the brain which had been prepared. With a low power we discovered that there was a peculiar laminated structure to the tissue, whereupon I planed off a little more of it in the direction of the laminations or strata, the first having been transverse or across these layers.

And now was presented a mystery. Curious markings which my friends declared did not belong to the ordinary structure, were plainly seen. Some were geometrical, some sinuous, others wavy, and all to a greater or less degree crossed each other. We now applied a higher power and secured a magnification of about 600 diameters. This still further increased the mystery. The markings assumed a more definite form, and seemed continuous, as if a part of a picture or design; a series of pothook shaped figures commingled with what appeared to our surprised vision to be Chinese characters or Egyptian hieroglyphics, all involved in a sinuous, vermiform-like mass.

My first step was to secure a photo-micrograph upon a sensitive and delicately prepared plate. Then I determined to subject this plate to further magnification or enlargement. But now came the difficulty of enlarging the picture already made, because the deposit of bromide of silver when magnified complicated the images found in the brain tissues. Finally this was overcome by preparing upon an (optical) plane surface of glass a sensitive coating of albumen which was absolutely structureless, and gave an image free from all stria and imperfection. By the use of an objective of a very high power we now had an amplification of 3000 diameters of the original. This gave on our plate a few complete characters that were the wonder of every person present.

Fully convinced that the figures were not of a generally recognized physiological character, I timidly suggested to some of my scientific friends that they might be symbols. One of them, a learned man, who had been for years in the East a teacher and missionary, and who is withal a philologist of experi-



ence, said, "Yes, they are strangely familiar." When informed of the nature of the specimen under examination, and told that it was a portion of the brain of a human being who in life was distinguished for his linguistic attainments, his astonishment knew no bounds. Looking at them still more closely, he then assured us that the images, so unintelligible to ordinary eyes, were in truth characters in the Ethiopic, ancient Syriac, and Phœnician languages. He pointed out the differences between them, and, as far as he could do so, gave their names and meaning, and in brief so fully identified them as to remove all suspicion of a merely accidental coincidence. Naturally the minuteness of the microscopic field prevented intelligent combinations, for the tracery was so complex, irregular, and involved as to forbid the hope of unravelling by any means now known the tangled records of thought, if such they were, so manifestly inscribed upon that bit of brain.

If anything practical shall result from this discovery; if, for instance, future literary executors shall be able to extract from the distinguished dead posthumous poems, suppressed opinions, the contents of "burned letters," family secrets, or the mysteries of life that are buried, it will be a truly remarkable achievement of science; but whole lives of patient experiment and profound study must be expended upon a perplexing field of investigation before such a marvellous result can be attained. My own business claims too much of my time to permit me to give the mysterious subject the attention it requires, but now that I have suggested its possibilities, there are, without doubt, others who will eagerly explore this hitherto unknown realm.

GEO. R. ROCKWOOD.

17, Union Square, N.Y., Dec. 28th, 1887.

## INSTANTANEOUS STUDIES.

### No. 13.—THE "FLASH" PHOTOGRAPH.

(Scene: A Police Station.)

*Police Inspector.* What's the charge P 244?

*P 244.* I was on dooty at eight o'clock to-night in Trafalgar Square when I see prisoner come along with this 'ere box in his right hand. Directly he got within three or four yards of me, something blazed up in his other hand, and suspecting as the box he'd got was a infernal masheen, and that he was one of them diameters, I took him into custody. I found this powder and this piece of crumpled paper in his possession.

*Inspector (to prisoner).* Have you anything to say?

*Prisoner.* Certainly, I have a good deal to say. In the first place, this box is a camera, and not an infernal machine, excepting when it makes people very ugly. This powder and paper, of which I have some more in my waistcoat pocket, from the new illuminating combination magnesium powder and gun paper.

*Inspector.* Most dangerous. Highly explosive. 21 Reserve, bring a pail of water at once.

*Prisoner.* Excuse me, but there is not the slightest danger. I was going to say it occurred to me that I would like to take the portrait of P 244 here, and I accordingly lighted a small quantity, as I am doing now (strikes a match and lights the compound. Before the police recover from the shock the flash is over. They rush forward and seize him).

*Inspector (pale, but determined).* This is the most dangerous assassin I have ever seen. But for the fact that the stuff evidently missed fire, we should have been all blown up. These men care nothing for their own lives so long as they accomplish their ends.

*Prisoner.* If P 244 will kindly remove his knuckles from my throat, and his knee from the small of my back, I shall be able to demonstrate that you are quite in error. Perhaps you'll pass the camera.

*Inspector (grimly sarcastic).* Oh, yes; it looks like a camera, doesn't it? Cameras are just like black leather cases, aren't they? Look sharp with that water, 21. Let no man touch it for fear it goes off.

*Prisoner (losing his temper).* Well, of all the stupid —

*P 244.* Come, no bad language here.

*Prisoner (exasperated).* Do you mean to say you don't believe me.

*Inspector (still ironically).* Oh, we believe you. We've been looking out for you for a long time. We've had no end of complaints from people who have been frightened by sudden flashes of light exactly the same as yours. No doubt your machines are fearfully badly made, and that's why the stuff doesn't explode.

*Prisoner.* But, officer, I tell you there's not the least danger. These are all photographic flashes, and the photographic flash is the latest thing out.

*Inspector.* That'll do. Remove him to the cell, 244.

*Prisoner.* Anyway, you'll permit me to send for bail.

*Inspector.* It's like your impudence to ask. Certainly not. Oh, here's the pail. Plunge everything in, box and all, and take them at once to Col. Majendie.

(21 gingerly takes up the detective camera and the powder and the paper, and gently deposits them in the pail. Prisoner is removed to the cell, protesting that he shall sue the authorities for the damage done to his property.)

### THE FOLLOWING EVENING.

*Inspector.* Ahem. Well, we've had an answer from Col. Majendie, and it appears he can find nothing dangerous in the box, which, apparently, is an ordinary camera.

*Prisoner.* I beg your pardon, it is not an ordinary camera at all. Ordinary cameras are never soaked in water for a night.

*Inspector.* I cannot discuss the question now. You are discharged.

*Prisoner.* Thank you for nothing. Perhaps you'll compensate me for injuring my property and locking me up.

*Inspector.* I've nothing to do with that. Go away.

### MORAL.

Amateur photographers must be careful how they use the magnesium flash in the street until the police get used to it.

## STEREOSCOPES AND BINOCULAR VISION.

BY W. F. DONKIN, M.A., F.C.S., F.I.C.\*

TWENTY-FIVE or thirty years ago the stereoscope was to be found in every drawing-room; it was as necessary a piece of furniture as the piano. Now-a-days, it has disappeared. Why is this? Why has this beautiful instrument been almost universally discarded, although by its means alone can we obtain "counterfeit presentments" of nature, with the attribute of apparent depth and solidity? There must be some reason why it has gone out of fashion; and I am inclined to think a reason is to be found in one of the common failings of human nature—laziness. It is both simpler and easier to look at a single photograph, than to put a double photograph in a box and look at it through two peep-holes. Again, two or more people can look at one photograph simultaneously, while only one at a time can use the stereoscope. Another reason is doubtless to be found in the fact that many people fail to combine the two pictures satisfactorily, and so get no stereoscopic effect at all. This may be due either to inequality in the observer's two eyes, or to defects in the stereoscope itself. The cheaper kinds of instruments were often so badly made that it was hardly possible for anybody to use them, at any rate, without straining the eyes. And, lastly, to look at stereoscopic pictures, you must have a stereoscope; and most people will agree that the cost of a good stereoscope is a serious objection to its popularity. This objection does not apply in the case of a novelty that hits the public taste; but the stereoscope is long past the stage of novelty. I am, therefore, somewhat doubtful as to the probability of its revival as a popular instrument; but as an optical instrument it gives results of so much beauty, and opens up so many interesting questions in regard to the phenomena of vision, that I think we may profitably devote a short time to its consideration.

It is only within the last sixty years that scientific men have arrived at a full perception of the use of having two eyes instead of only one. Previously to the year 1830, doubtless many a man who had lost one eye had found that he lost with it some of his power of recognizing the relative position or distance of objects, without anybody being able to tell him why; but about this time Wheatstone was investigating the facts of binocular vision,

\* Communication to the Photographic Society of Great Britain.



and in the year 1832 he proved clearly that the primary reason why we have so distinct a perception of the solidity of objects we look at is, that each eye receives a different impression of the same object. Other investigators seem to have had some idea of this kind, but Wheatstone was the first to prove it by drawing two slightly different pictures of the same object, as seen by the two eyes separately, and to construct an instrument by means of which each eye should look at its corresponding picture alone. He thus produced artificially a perfect impression of solidity by means of pictures on plane surfaces, and gave the name "stereoscope" (from the Greek stereos, meaning solid) to the instrument.

The apparatus was simple enough; it consisted of two plane mirrors inclined at an angle to one another, and two flat boards, on which the pictures were mounted, right and left of the mirrors. I have here a reflecting stereoscope of this kind. Some five years later, Sir David Brewster wrote some valuable papers on binocular vision, and constructed a new form of stereoscope, in which, by means of two prisms, a similar combination of two pictures could be effected. This was greatly improved in the year 1849, by Duboscq, of Paris, who substituted convex lenses for the prisms, thus obtaining clear definition. Wheatstone's stereoscope admits of the use of pictures of any size, but is somewhat cumbersome, and the necessity of having two pictures separately mounted is a disadvantage. Brewster's instrument is much more compact, and the two pictures are mounted on one card. The size of the pictures is more limited, but this is compensated for by the use of the convex lenses. For these reasons the reflecting stereoscope never came into popular use, and Brewster's alone survived.

In order to understand clearly the principle of the stereoscope and the phenomena of binocular vision, it is necessary first to consider very briefly the structure of the eye as an optical instrument. To anyone with the most elementary knowledge of its structure, its close resemblance to a photographic camera is obvious. And yet the most universally adjustable camera, with the most achromatic of lenses, its eluminescence itself, compared with the human eye. Here is a miniature camera, blackened inside with a perfectly non-reflecting pigment, furnished with a marvellously sensitive plate—the retina—endowed with the property of re-sensitising itself instantaneously after use, with a lens of perfect transparency, free from spherical aberration because its surfaces are not spherical but spheroidal, and achromatised by a uniform increase of density from the outside to the centre, protected in front by a transparent covering—the cornea—and furnished with an iris diaphragm, which adjusts itself from about  $\frac{1}{6}$  to  $\frac{1}{4}$  in perfect sympathy with the requirements of the retina. For a long time it was supposed that the eye focusses itself on the same principle as the camera, viz., by altering the distance between the lens and retina. Here, however, there is a striking difference; the focus is lengthened for distant objects by flattening the lens, while it becomes more convex for near vision. All these adjustments take place unconsciously and involuntarily, or nearly so. In one respect, however, the eye differs absolutely from the camera, and it is a most important point in regard to binocular vision. Whereas, the photographic plate is equally sensitive all over, the retina is not so, but from the central point the sensitiveness diminishes regularly all round. This point, a little yellow spot about a millimeter in diameter, is centrally placed in the axis passing through the centres of the lens, and iris, and cornea. This line is called the line of sight, and when we look at a small object, the eye is turned so that the line of sight passes through it. We are conscious of seeing other objects around, but far less distinctly. If the object looked at is very distant, the lens is automatically flattened by the action of a circular curtain of muscles all round it; when the object approaches, these muscles relax, and the lens becomes more convex, so that the focus remains on the retina. There is, of course, a limit in this direction, and the normal eye cannot focus itself for a distance of less than five or six inches. Thus the whole use of the eye is to form a perfect image of external objects on the retina. The brain perceives this image, through the optic nerve, and the attention is mainly concentrated on the impression received from the central spot. It is indeed in the brain, rather than in the retina, that the sensitiveness is graduated; very faint impressions are received by the retina over the greater part of its area, but the power of fixing the conscious attention on them is very limited outside the small area of the central spot. It may be remarked, in passing, that this fact is closely connected with the development of our intellectual powers. The lower animals have no central spot, and

probably their conscious impressions of external objects are much wider and more equally distributed than ours. We can concentrate our attention on the impressions received on the central spot, to the exclusion of all others. It is, so to speak, a case of extreme local intensification; like a tiny spot of hypo on the half-developed bromide print.

So far we have been considering the single eye only; but we have two eyes, and thereby we gain a great deal more than a mere re-duplication of the powers of one eye. Since the two eyes are separated by an average distance of  $2\frac{1}{2}$  inches, the images on the two retinas of a solid object near at hand must be different. These two different images are both separately perceived by the brain, but by long practice we have learned to combine the two impressions into one, and thence to derive the idea of solidity. There are two important factors which contribute to this result. One is, that in looking fixedly at any near point on a solid object with both eyes, the lines of sight must converge at a certain angle and pass through that point; the other is, that the focus of each lens must be adjusted for that particular distance. If we now look at a more distant point, the lines of sight become more parallel, and, simultaneously, the lenses become flatter. These movements are effected by separate sets of muscles; the eye-balls are rotated by external muscles, and the shape of the lens is altered by the internal ciliary muscle; but although, anatomically, these are quite independent, yet, by long education, we have unconsciously learned to work them in absolute sympathy with each other, and always in the same direction. Thus convergence of the optic axes or lines of sight is accompanied by relaxation of the ciliary muscle, and *vice versa*. Information of the action or condition of these muscles is conveyed to the brain through what is called the muscular sense, and it is chiefly through this information that we unconsciously arrive at an estimate of the distance from us of the point gazed at. Of these two sources of information, that derived from the convergence of the optic axes is the most delicate, and, obviously, both will fail to differentiate between points so far off that all the rays of light entering the eyes are sensibly parallel.

In ordinary circumstances, we are greatly assisted in our estimate of the relative size, position, and distance of objects by their colour, the light and shade on them, by aerial perspective, and by geometrical perspective. Thus one-eyed persons are not so badly off in this respect as if we depended solely on the sense of convergence of the optic axes for these estimates. Indeed, that we can judge of distance to some extent by focal adjustment alone, all other means of estimation being eliminated, may be shown by the following experiment:—Make a print from a small negative direct, and another enlarged, say, to double the size. Set up the enlargement opposite you at about two feet away, and hold the small print at one foot from you and above the other one, and look at each alternately with one eye through a roll of paper, so that nothing but the central part of each picture is seen. Obviously, they will subtend the same angle at the eye, and the images on the retina will be exactly similar in every respect, except that of focal adjustment. This single criterion of relative distance is amply sufficient, and you can say with certainty which is the nearer picture. It is curious to note that, although the other eye is closed, the converging muscles act simultaneously with the focussing muscles, and you can feel the eye-balls turning, though uselessly, in this case.

By a simple experiment with a Wheatstone's reflecting stereoscope, we can similarly eliminate all adjustments except that of convergence, provided the mirrors are hinged together. If the angle between the mirrors is slowly varied while the attention is concentrated on the combination of the two pictures, the impression is that the view recedes and grows bigger while the angle is increasing, and approaches and grows smaller while the angle is decreasing. This is a very curious illusion; the focal adjustment tries to follow the motion of the eye-balls, but lags behind, and is all the more puzzling because perfectly useless, since the distance of the picture remains really unaltered.

We are now in a position to see how far the stereoscope can really give the impression of solidity as compared with what we learn by direct binocular vision.

Obviously, we lose all information due to focal adjustment, since the pictures are on a plane surface; and further than this, the equality of focal adjustment all over the apparently solid object is in opposition to the constantly varying axial convergence, and to a slight extent spoils the illusion. The effect of this is perhaps to increase the impression that one is



looking at a small model of the object or scene. But as compared with an inspection of a single picture with both eyes, the stereoscope has a great advantage in two respects. In the single picture, binocular perspective (the combination of two dissimilar impressions) is of course wanting, but, more than this, the flatness of the surface of the picture asserts itself, both through axial and focal adjustment, in direct opposition to the perspective of the scene represented. By closing one eye, we get rid to a great extent of this obtrusive flatness, and allow the binocular perspective, and light and shade of the pictures to produce their full effect almost unhindered. And so, at the Royal Academy, we see ladies looking at a picture through a rolled-up catalogue, and saying: "Dear me, how it stands out!" without, however, having much idea why. It follows from this that when we look at a small picture closely with both eyes, we intensify the impression of flatness; hence the greater artistic value of large and long-focus pictures.

There are still some points to be explained in the theory of binocular perspective, which have given rise to much discussion. Wheatstone's theory was that in viewing a solid object or scene, two slightly dissimilar images are formed in the two eyes, as already explained, but the mind completely unites or fuses them into one. Whenever there occurs such complete mental fusion of images really dissimilar in this particular way, and therefore incapable of mathematical coincidence, the result is a perception of depth of space, or solidity, or relief.

This theory is, however, the result of imperfect analysis of visual impressions; for in stereoscopic diagrams it is always possible to detect the doubling on which the perception of depth of space is based. It is a little more difficult in ordinary stereoscopic pictures, and in natural scenes; but practice and close observation will always detect it in these also. Wheatstone's theory, therefore, seems true only to the unpractised and unservant.

Brücke, Brewster, and Prévost, by more careful observation, have perceived that there is no real mental fusion of the two dissimilar images. Their view is expressed as follows by Brücke: In regarding a solid object, or a natural scene, or two stereoscopic pictures in a stereoscope, the eyes are in incessant unconscious motion, and the observer, by alternately greater or less convergence of the axes, combines successively the different parts of the two pictures as seen by the two eyes, and thus by running the point of sight back and forth reaches by trial a distinct perception of binocular perspective or binocular relief, or depth of space between foreground and background.

This theory is a great advance on Wheatstone's, but although partly true, it is evidently not the whole truth, as is abundantly proved by the two following cases:—

1. If we set up two sticks, one beyond the other, and look steadily at one of them without the slightest change of convergence, we are yet fully conscious of the depth of space between the sticks. Here there is evidently no trial combination or running of the point of sight back and forth.

But if it still be said that it takes place unconsciously, the theory is completely disproved by Dove's experiment:—

2. The instantaneous perception of binocular relief was proved by Dove, who showed that if a natural object, or a scene, or two stereoscopic pictures, be viewed by the light of an electric spark, the perspective is perfect, though the duration of such a spark is less than the  $\frac{1}{1000}$  of a second. On a dark night the relative distance of the objects is perfectly perceived by the light of a flash of lightning. It is inconceivable that there should be any change of optic convergence in such short spaces of time. Evidently, therefore, binocular perspective may be perceived without such change of convergence.

Both Wheatstone's and Brücke's theories are therefore imperfect, though each is right to some extent. A new theory has been propounded by Dr. Le Conte, of the University of California, which, though hinted at by Helmholtz, has not been distinctly formulated by him. It is as follows:—All objects or points of objects, either beyond or nearer than the point of sight, are seen double but differently; that is, those beyond are seen by the right eye to the right of the point of sight, and by the left eye to the left; while those nearer than the point of sight are seen also double, but the image in the right eye is to the left of the point of sight, and that in the left eye to the right. This has been seen and understood in a moment by holding up two fingers straight in front of the face, at one foot or two feet distance respectively. Looking at the near one steadily and shutting the left eye, the right eye sees the farther finger to the right of the nearer one, and so on. Le Conte expresses it briefly by saying

we see farther objects doubled homonymously, and nearer objects doubled heteronymously. The double images in the former case are united by less convergence, those in the latter by greater convergence of the optic axes. Now Le Conte's theory is that we know instinctively and without trial, in any case of double images, whether they will be united by greater or less optic convergence, and therefore we never make a mistake, or attempt to unite by making a wrong movement of the optic axes. In other words, the eye (or the mind) instinctively distinguishes homonymous from heteronymous images, referring the former to objects beyond, and the latter to objects this side of the point of sight. Or, we may put it more briefly thus:—In case of double images, each eye, as it were, knows its own image, and knows how it would move if the inclination of the optic axes were altered. This is all that is absolutely necessary for the perception of relief; but it is certain that the relief is made clearer by a ranging of the sight back and forth, and a successive combination of the different parts of the object, or scene, or pictures, as maintained by Brücke.

It appears to me that this theory explains all the facts well up to a certain point. By careful analysis of our perceptions we can trace the working of this most complex, beautiful, and delicate optical apparatus—for really the two eyes and the optic nerves, and a part of the brain, form together one instrument—up to a certain point. Changes, physical, and even chemical, can be detected and pursued a long way; but there is a limit to our investigations. At a certain stage we are brought up short, and we find ourselves face to face with something super-physical and super-chemical, or else a physics or a chemistry far higher than any we yet know. At a certain point molecular and chemical change is replaced by sensation, perception, judgment, thought, emotion. We pass suddenly into another and wholly different world, where reigns an entirely different order of phenomena. The connection between these two orders of phenomena is absolutely incomprehensible, and must ever remain so. Certain vibrations of the molecules of the brain, certain oxidations, with the formation of carbonic acid, water, urea, on the one side; and on the other there appear sensations, consciousness, thoughts, desires, volitions. But how or why they are inter-dependent, we know not, and can never hope to guess.

I am conscious that in this brief *résumé* of the chief facts of binocular vision, I have omitted many important points, and have said but little about the construction of stereoscopes, or about stereoscopic photography. My object was rather to call attention to some of the less commonly known facts and theories that underlie their use. I am largely indebted for what I have learnt of the subject to Le Conte's book on "Sight," Vol. XXXIII., in the International Science Series.

## PRESIDENTIAL ADDRESS AT THE LIVERPOOL AMATEUR SOCIETY.

B. J. SAYCE, PRESIDENT.

GENTLEMEN,—And addressing you as a Society, I add, with great satisfaction, the magic word "Ladies!" for, happily, the Liverpool Amateur Photographic Association is honoured in having the names of ladies on its roll of members. May their numbers increase and their presence brighten our meetings, for there is nothing inconsistent with feminine delicacy in the practice of photography; but, on the other hand, if I may judge of the general skill of our lady members from the examples which I have had the privilege of inspecting, it is probable that, in the next epoch of our Society's career, we may find our fair sisters rivals of the first rank; yet we need not wish the contrary, for such competition cannot fail to be both agreeable and instructive.

Our Society now enters on its twenty-fifth year. A quarter of a century has nearly passed since a few of the then amateur photographers of Liverpool met together to establish it strictly as an association of amateurs, and I hope, as such, it will long continue to flourish; also that the members will vie with each other in maintaining a prestige worthy of the earliest founded Amateur Photographic Association in England.

There are those in our ranks who can recall the days of the infancy of photography, and know from experience by what patient and persevering, but always interesting study, the gradients have been traversed to the present height; yet we are very far from the summit, though fifty years of progress are now recorded.



Coincident with this circumstance we are proud to own as an honorary and *honoured* member one who, as an amateur photographer, now arrives at his jubilee in this charming pursuit. He is our link between the present and the time when photography was not, and among us hearty and strong, as genial and helpful to the utmost, as in the days of yore, and all will unite with me in wishing many happy new years to our veteran, Mr. James Alexander Forrest.

My idea had been that, in this address, we should "not only consider the present by looking round, and the future by looking on, but the past by looking back;" but Mr. Forrest has, in a very extensive manner, dealt with the past (with the events of which, as regard our art-science, he has been intimately associated) in an article published in the *Liverpool Mercury* of 20th instant, intended as an *avant-courier* to our international exhibition of photographs. I will, therefore, in a general way, limit myself to stating that there was good work done in those early days by Lancashire men. The great sister cities of Liverpool and Manchester can show negative work of bygone days which, excepting the feature of rapidity, will excite intense admiration now; but they are of different schools. Manchester, having found a sure path, followed it with that determination which has always been the characteristic of her sons. The collodio-albumen process, to which I allude, though somewhat slow, even then, was one to be relied upon, and its followers men who knew well how to show it to the best advantage.

Now, with regard to ourselves. On one occasion, being introduced to a gentleman in London, it was incidentally mentioned that I came from Liverpool. "Oh," said my new friend, "that is America." I asked why? and was told, "You are Yankees in your habits." Well, perhaps he was not wrong in his estimate, for while our Manchester brothers (I do not intend a pun, though one bears the name of Brothers, and would ably illustrate my point) were steadily drawing things of beauty from their well-tried collodio-albumen, Liverpool was running after processes that were new.

We were fortunate in having among us men not easily daunted by difficulties, and scarcely had the emulsion process been hatched than our Mr. Osmond R. Green, who had up to that time coated plates 12 by 10 inches, provided himself with a camera to produce direct negatives 24 inches by 18, and ably demonstrated the capabilities of the early formulae of collodio-bromide emulsion. I have reason to believe that he may again be able to gladden us by the exhibition of his entire collection of those gigantic and beautiful productions; nor could there be a more healthy stimulus to beginners, for let it be borne in mind that every stage of their preparation and subsequent treatment, down to the finished mounted print, was personal work in his case, and the novice who has just purchased his dozen quarter-plates will, perhaps, never realise what such work meant, for there is now a "royal road" to excellent results, free from the stumbling blocks daily met with by the men who belonged to those days, while in the matter of cost, the burden not only to the beginner, but to the old hand, is very appreciably lessened, and without a thought of having to stay up, night after night, till the smaller hours began to grow in number, to the injury of health and disgust of the family, preparing that batch of uncertain bath plates which was to form the stock for a holiday tour, all can, for a few shillings, supply themselves with plates or films which are clean, rapid, excellent in every respect, and capable of almost automatic development. Such being the case, we may thank our stars that those days of labour will never return, though it will be not less necessary in the interests of the future that every amateur should make himself acquainted with the classics of our art, and strive to unveil its further resources.

Let us now glance at the aspect of the photographic horizon. We have, firstly, the battle of the sensitive surfaces—those supported on glass, and those on paper or tissue; and while it will be for workers with glass to show cause for continuance of its burdensome weight for landscape work, and its liability to fracture, those who advocate the use of a lighter medium must be prepared to furnish results as will answer all possible objections to their use. I trust we shall, this summer, have this matter brought to a practical issue at our excursions. Yet why outdoor only, when the magnesium flash, combined with extreme sensitiveness, is opening up new and hitherto unattainable visions for our lenses to perpetuate?

Permanency of printed surfaces is occupying, as it should, great attention. How few works of the old masters could be gathered together to form a permanent gallery! Some have

stood well where washing and other details of manipulation have been thorough. But these are the exceptions. Now, however, with indelible carbon, and probably with developed prints, posterity may have opportunities of comparison which are denied to us.

With the exception of what our worthy Secretary has done, I cannot find that our members have interested themselves in orthochromatic photography. The relation which coloured objects present to the observer it is highly important to preserve. We all know how misleading attempts to reproduce colour in proper balance have hitherto been, and in this branch there is great room for experiment, which I commend to those who are blessed with the leisure essential to success.

Production of great pictures by enlargement of small negatives, and reduction of the same to lantern slides, have never, perhaps, been so enthusiastically pursued as at present, and these delightful transmutations are within the reach of all, for there is nothing of mystery in their treatment. By the former we avoid the *impedimenta* of bulk and weight in travel, and the latter afford amusement and edification, simultaneously, to vast numbers, who by no other means could be so easily instructed and pleased.

As all are aware, this will be an eventful year in our Society's history. We have an energetic and able committee which has charge of a forthcoming International Photographic Exhibition, and is endeavouring to make it as complete as possible. They will do their share, but they rely upon your co-operation. From what we see of each other's work it is certain that nearly all have good negatives, and, having such, let each member be represented on the walls of the Art Gallery. A hearty response has been made to the announcements, and from distant places we have many promises of support; we may also count on valuable help from our active offshoots on the Cheshire side; and the Birkenhead Society, whose annual *soirée* is usually held at this season, has caused it to be omitted—an act of courtesy which we highly appreciate.

His Worship the Mayor (F. W. Oakshott, Esq., J.P.) has kindly consented to inaugurate proceedings at the *consecrazione* which will precede the public opening, and on that occasion the magnificent galleries in which the work of art purchased by our Corporation as a permanent collection (would I could say the same for photographic studies!) will be thrown open for promenaders; it is also expected that the occasion will be rendered more interesting by the presence of many whose names are household words in the world of science, literature, and art. Lantern exhibitions will be an attractive feature, and your contributions of the best slides will be highly useful for these occasions.

Those who were present last year, when Whitby views were shown, will know that we may expect a great treat to-night in illustrations of holiday tours by Messrs. A. W. Beer and A. W. Cornish. So, in conclusion, I beg to express my deep acknowledgment of the honour you have conferred upon me by election to this office, and my hope that the year may be marked as one of progress and prosperity to yourselves personally, and to the Society as a Liverpool institution.

## PHOTOGRAPHY AND THE PRINTING PRESS.

BY H. TRUMAN WOOD.\*

THERE are, however, other means for producing type blocks by photography, in which etching is not employed. If a thick film of sensitised gelatine be exposed under a negative and soaked in water after exposure, we get what is known as a swelled gelatine relief, the unexposed parts, of course, swelling up, while the others remain unaffected. A cast from such a relief forms the model of a printing surface, from which, by a duplicate process of casting, or electrotyping, the actual metal printing-block is obtained; or, by a variation of this process, the gelatine, instead of being swelled, can be washed away entirely by hot water, and a mould from a cast of this sort serves for the production of the ultimate electrotpe. The relief obtained by these devices is, as may be supposed, very slight, and it is usual to increase it in the whites of the picture by the addition of melted wax on to the mould from which the final electrotpe is taken. A convenient way of doing this is to hold a piece of wax against a heated rod of metal, so that the wax may run down the metal and be guided by the point to the

\* Continued from page 75.



parts required. Messrs. Dawson, whose very ingenious wax process I must debar myself from describing, since it is not a photographic one, uses, both for it and for their photo-relief process, a special pen, which is kept hot by a small gas-jet, and which allows the wax to be delivered with as much facility as ink is by an ordinary pen.

Quite recently, Herr Husnik, of Vienna, has made a new departure in the production of relief blocks by printing from the surface of the gelatine itself. Details of the process have not yet been published, and I have no practical knowledge of it myself. So far as I understand it, the film of sensitised gelatine after exposure is reversed, and developed in the same way as a carbon print; but instead of plain water being used, the developing solution is a saturated solution of bichromate. This, I suppose, has a further hardening effect upon the film, and it is also certainly a more energetic solvent of the soft parts than water. At all events, the film thus treated can be mounted upon a zinc backing, and, when dry, used for printing with type.

It will now be clear that, by one or other of the above-described processes, it is possible to obtain from any negative in line or stipple a block which can be used in an ordinary type-printing press; and as such a negative can be obtained from a picture of any character, it is evident that we have the power of producing a printing-block from any print, sketch, or drawing of any character. A line engraving may be thus treated, or an etching or a pen-and-ink sketch made on purpose; or even a pencil drawing. Some years ago, when Mr. Hamerton published his well-known work on "Etchers and Etching," he was anxious to print as a vignette on his title-page a reproduction of an etching. To do this, he was then obliged to have a wood-cut made, and the job must, I should think, have been one of the most troublesome that the artist who executed it ever undertook. The production of such an illustration would at the present time be a bit of ordinary commercial work, and would be turned out by any one of a dozen or more firms at so many pence a square inch.

The next question is, how from the ordinary half-tone negative, with every gradation of shadow between pure white and intense black, is it possible to produce a negative in which there is really only one gradation from black to white, the intermediate shadows being represented by masses of broad or narrow lines, or of lines or dots at varying distances apart? The devices which have been employed to attain this end have been very numerous, and it is not difficult to understand that they may vary considerably according to the class of printing which is to be employed. If a surface block is wanted the lines must be fairly bold and strong, the grain must be open, and the amount of relief should be considerable. If the printing is to be from an intaglio plate very much less relief is required, and the grain may be very slight—indeed, sometimes it is sufficient to give merely enough tooth, or roughness, to the plate to enable it to hold the ink. For photo-lithography, again, a very fine grain or texture will suffice.

So little grain is wanted for an intaglio plate, that it is quite possible to produce a printing-plate direct from a half-tone positive; and it was in this way that the earliest plates were made by Talbot and others. Talbot's plan was simply to coat a copper-plate with bichromated gelatine, and to expose it in the usual manner. The plate, after exposure, was placed in an etching bath. Where the gelatine remained soluble, the etching fluid passed through and attacked the copper below; where it was insoluble, it prevented the passage of the fluid, and the copper was entirely protected. In the parts where the insolubility extended to a less depth—that is, in the various ranges of half-tones in the picture, the copper was attacked to a greater or less extent. The variations in relief thus obtained, combined with the tooth or roughness given by the natural action of the etching fluid, was sufficient for printing purposes. Many of the modern methods are founded on this same principle, but additional means are generally employed for giving the required grain.

Of the various means employed to attain the desired end, I believe that the majority may be arranged under one or other of the following two heads; either the print from the negative is taken on a sensitive surface capable of being made to show granularity in one shape or another, or the half tones of the original picture are broken up in a purely mechanical fashion by imprinting on the sensitive surface a uniform grain or tint or net-work. As a rule, this breaking-up is effected by interposing a screen on which a suitable "tint" has been photographed between the negative and the sensitive surface. Such a screen

may be obtained by copying the lines printed on paper from a specially ruled copperplate.\*

Now, it is really very difficult to give any clear reason why this chopping up a picture into little squares—a device which is said by calumnious critics to produce a result like looking at a picture through a gridiron—should have the effect it does. The precise devices employed to produce the really marvellous results which are produced by its aid are, for the most part, trade secrets. Various patents have been taken out, but you will have to study those patents a very long time before you will get much information out of them. Skill and ingenuity, clever manipulation, and a knowledge of minute details—wrinkles, in fact—are the main factors. To judge of the results, you have only to look at the very interesting collection of examples which the kindness of the principal makers and users of process-blocks has enabled me to show here this evening.

One great difficulty in the use of these process-blocks—and the methods with which we are at this moment dealing are practically employed almost entirely for surface-blocks—is the extreme care and very great skill which are required in printing them. As you may see by the specimens of the blocks themselves exhibited this evening, they are all extremely shallow. An ordinary printer, given a process-block to work from, generally succeeds in producing nothing but a black smear, and the illustrations which are now so successfully used in many of our illustrated papers reflect, in fact, more credit on the printer even than on the maker of the block. For some time foreign countries had the advantage of us in this respect, but our printers are now becoming fully alive to the importance of processes, and they are, I am glad to say, showing themselves quite capable of making the best use of them.

We may next consider those methods in which the print is taken on surfaces capable of showing a grain. You are probably aware that the bichromatised film, when wetted, has a property of reticulating or covering itself with minute vermicular markings. This tendency is increased by the addition to the film of a deliquescent salt. The character of the reticulation varies considerably, according to the nature and properties of the film, and its amount varies with the amount of exposure to light. Where the gelatine is unaffected by light, it is thoroughly soluble, and there will be no reticulation. In the highest lights, again, the gelatine will not swell, but remains unaffected by the water; and here, also, there is no reticulation. In the shadows the reticulation will be graduated; it is slightest where the light has acted slightly, and it increases till it begins to merge into the solid shadows.

We have, therefore, after exposure and soaking, a film with the high lights raised and smooth, the middle tones partly raised and grained, and the solid blacks depressed and smooth. A cast from this represents a typographical block. It is not easy to electrotpe from wet gelatine, so that it is better to take a cast from the gelatine, and reproduce this by a double electrotyping, or by a second casting. The picture on the screen is a reproduction of a print from an old Pletsch block, and shows very well the way in which the grain works itself into the details of the picture. Pletsch's process is one which really gives very satisfactory results, and it is not extremely difficult. One of the earliest to carry out work on the lines laid down by Pletsch, and to produce actual commercial results, was Mr. Dallas. Mr. Dallas's process is a secret one, and I have no knowledge whatever of the way in which his results are attained. They are, however, very similar to what could be got by modifications of the Pletsch process.

To the same class of processes belongs the modifications of Captain Abney's papyrotype, recently introduced by Sergeant-Major Husband, and known as Papyrotint. It is a transfer process. The print is taken on paper sensitized with bichromate mixed with ferricyanide of potassium and common salt, a mixture which certainly produces a very nice smooth grain. The process is intended for photo-lithography, and it has the great advantage to the amateur of having been very fully and clearly described. The photograph which I show may serve for comparison, but a better judgment may be formed of the results by an inspection of the full series of specimens, which I owe to the kindness of Captain Maycock.

Another method of introducing texture into the sensitive surface has been the introduction into it of some granular

\* Diagrams, showing the nature of the screens used, and the effect of their application to a half-tone negative, were shown, and these were followed by a number of slides from pictures produced by certain of the processes in which a screen is used.



material. That ingenious and prolific inventor, the late Walter Woodbury, mixed crushed glass or other powder with the gelatine, and ultimately got a printing plate by electrotyping. Methods of this nature give a very flat and uniform grain, as might be expected; and this led Colonel Waterhouse to seek for what he termed a discriminating grain, which should be closer in the shade than in the high-lights. He sifted waxed sand over a wet gelatine relief which had been developed on a metal plate, the sand having been stirred up in melted wax till all the grains had been coated with the wax. When the sand was dusted off, after the relief was dry, it was found that the little pits made by it were deepest in the thick parts of the relief, and shallower in the thinner parts; where the metal was bare no sand had adhered, and a smooth surface was left. From the plate thus prepared an electrotype was taken.

A modification of this method was introduced by Mr. Sawyer, of the Autotype Company, and described by him before the Photographic Society. Powdered graphite was introduced into the film, in order to improve the conducting qualities of the material, and render the electrotyping easier.\*

If what I have said has not been enough, at all events the collection on the walls of the Club will suffice to show how great and how valuable a power has been placed in the hands of the artist by the union of photography with the printing-press. On the one hand, he can be absolutely certain of having anything he likes to draw in line reproduced in absolute facsimile. Of course, it will only be in facsimile. The camera will not touch up careless work, render in accurate and delicate line the sketchy indications of the pencil or the brush, but that is not the fault of the camera. There must be one artist to the work, not two. The first man must do all the work, not leave half of it to the wood-engraver. And then consider what freedom the process gives him. The wood-engraver is closely linked by the trammels of his art. By dint of the greatest skill and the greatest ingenuity, he has overcome the enormous difficulties inherent in the very nature of the art, but the limitations are there all the same. Every day gives the proof. Look at the illustrated papers, at the magazines, at the newest illustrated books: everywhere we find that free sketches, reproduced by processes in which photography has generally a share, are taking the place of the older woodcuts. Or ask the wood engravers. The whole class of engravers on wood are, I am very sorry to say, suffering under the competition of the new processes. That this should be so is surely a distinct loss, except that we can hardly doubt that the artistic faculty will find fresh means of expressing itself as the older fashions give way to the new; but it is no use denying the fact.

And so far as drawings in line are concerned, to stigmatise the new methods as mechanical seems to me to be simply ridiculous. They are no more mechanical than the ancient method of etching, in which chemical means were and are employed to fix into metal the very handiwork of the artist. To me they seem absolutely less mechanical than the very art of wood-engraving itself, when it is pursued by anybody else than the man who has actually drawn the picture that he is carving on to the wood.

When it is a case of the translation into a printing surface of a wash drawing made for the purpose, or of a picture in colour, the case is of course different. Here the epithet of mechanical is more truly deserved; whether any harm is done by the epithet is another matter. It is a handy term of abuse, and that is all. We may appeal to the facts. The finest of the photogravures shown this evening prove beyond question that by one means or another the most delicate gradations of light and shade can be rendered in a graduated stipple or tint. Yes, says the enemy, but this is hand-work. Well, so far as it is hand-work, it is at least not mechanical (take whichever horn of the dilemma you please), but, as a fact, the accusation is only partly true, while, if it were wholly true, it would not matter. What is to be considered is the result. As a matter of photographic interest, we set great store by an untouched plate. As a matter of artistic value, it does not appear to me to matter a whit whether photography has done more than serve as a basis on which some skilful craftsman has worked. It may make all the difference in the cost of production, but once produced the picture ought to be considered on its own merits.

When it comes to the reproduction of photographs direct from nature, we are dealing with a different condition of things alto-

gether. Let me make a clean breast of it. I never could fully appreciate the art of building up photographic pictures by the aid of models. I admire to the full the genuine artistic powers displayed by many who devote themselves to this most difficult branch of photography, as well as their technical skill. I should be proud if I could myself turn out work half so good. Nevertheless I never can be quite happy over it. It always smacks of the green room. The photographer can do no better than his models, and they, for the life of them, cannot help sitting for their likenesses, and showing it. You can pass a vote of censure on me if you like, *Liberari animam meam*. After all, perhaps, you will admit that the best picture, the picture that appeals most to the human mind, will be that which has the impress of the human mind upon it, and that no mere transcript of natural facts, however beautiful and however accurate, can appeal so readily or so swiftly to us as the picture which has been translated for us through the intervention of the artist's mind, which tells us, not merely what there is for us to see, but what the skilled eye saw, and what the clever brain selected as best for us to see.

This, however, is not the point for discussion this evening. I have been endeavouring to indicate to you the methods, or some few of the methods, which have been employed to render, as permanent pictures in printers' ink, the productions of the photographic camera. I hope I have convinced you that whatever can be photographed can be reproduced on a printing surface capable of being used for any of the purposes of the printer. I hope, also, that I have shown those artists who are present that they have no cause to fear the competition of this branch of photography. So far from this, they ought to, as many of them do, regard it as a valuable means of popularising their work, and as a most useful aid in giving expression to their ideas.

As one man can best express himself with the brush, another with the burin, a third with the etching-needle, and a fourth with the graver, why should we not have a yet newer school who will work within the limits laid down for those whose sketches are to be reproduced in the camera?

Why, again, should not a mezzotint engraver be content to take a plate on which as much work has been done by photography as photography can do, and work it up to the best possible point?

This is really the way in which artists should regard the photographic methods. They should accept them as valuable allies. The time for sneering at them has gone by.

### Notes.

Those who experiment with, or use, the magnesium flash light should not lose sight of the danger; a point upon which we have already touched.

*Anthony's Bulletin* reports a fatal accident in these words:—"It appears that John E. Richardson, of Germantown Avenue, Philadelphia, was engaged in the preparation of a mixture containing magnesium, picric acid, and potassium chlorate, for photographic light, and that while doing so the mass exploded, burning his face and hands and rupturing his left eye. As a result of these injuries he died a few days ago."

Few mixtures of an explosive kind are so dangerous as those containing picric acid and potassium chlorate, very moderate friction causing explosion. *Anthony's Bulletin*, the opinion of which commands respect as being edited by two eminent chemists, Prof. Chandler and his demonstrator, Arthur H. Elliott, deprecates the use of potassium chlorate in any form.

The following remarks, also from the editors of the *Bulletin*, merit careful consideration:—"We have been

\* To illustrate this part of the lecture slides were shown from pictures produced by the methods mentioned by Messrs. Dawson's process, by Messrs. Goupil's photogravure process, &c.



most careful, ever since the advent of these flash powders, to warn our readers against the use of potassium chlorate in them; and we have repeatedly condemned its use, from a thorough knowledge of what we were talking about, and a kindly feeling towards our fellow-men. It is positively cruel to place in the hands of people ignorant of its properties a percussion powder of the worst possible character, that the slightest friction will cause an explosion in."

"Furthermore, the presence of any organic substance only aggravates the trouble and facilitates explosion, unless present in quantities that unfit the mixture for its specific purpose, a flashing light. The presence of picric acid in these mixtures, instead of mitigating the danger, only adds thereto; for this particular compound is itself an explosive material." Indeed, some years ago, this very picric acid was proposed as a constituent of a new kind of gunpowder, but the idea was abandoned on account of the fact that the mixture was so readily exploded by friction or percussion."

The *Times*, we note, ignores all mention of certain photographs which were produced as evidence in a recent action for damages against a railway company for injuries sustained. Most of the other dailies record the fact that photographs of the plaintiff were produced showing the effect of these injuries. At what stage of the plaintiff's illness these photographs were taken we are not told, but if immediately after the accident they must have been very convincing, because, according to the *Times*, she (the plaintiff was a lady) had her nose tattooed, and her face otherwise damaged. We fancy, however, from the remarks of the counsel, that she was not photographed until some time after, so as to show the difference in her state of health. If so, perhaps the *Times* did not attach much value to the photographic evidence, probably knowing it is quite possible to make a person look well or ill, simply by peculiarities of lighting, exposure, and development. In regard to being photographed immediately after meeting with an accident, we are inclined to think nobody should neglect this precaution. A doctor's evidence is good so far as it goes, but coupled with a photograph of a cut face or a dislocated limb it would be irresistible.

An artist much in request among illustrated papers as a limner of portraits has come to the conclusion that the true level of popularity is to be found in the shop of the photograph dealer. "I went the other day," he says, "into a well-known photographic print establishment, and asked for two photographs which I thought he might have. 'I want a portrait of Mr. So-and-so,' I said. 'Never heard of him,' was the reply. This celebrity was, perhaps, not much known out of his circle, although the circle is a tolerably wide one, and the ignorance of the print-seller was to be excused. I tried him again with celebrity No. 2, which was Lord Brabourne, better known as the Right Hon. Knatchbull-Hugessen, politician, company director, and author of a popular book of fairy tales. 'Never heard of him,' was the stereotyped reply. It did

not strike me as surprising that the photographs I wanted were not on sale, but what did strike me was the tone of contempt of the dealer. In his opinion everybody whose photograph was not to be purchased was a nonentity. From his point of view he was undoubtedly right."

It is to be hoped that the accident—not by any means so severe as at first reported—to Mdlle. Seinde will deter others from being photographed in such a hazardous position as that chosen by the lady, namely, with her head in the mouth of a lion. Such a task must be rough, both on the photographer and the lion, and probably the two were equally frightened at the appearance of each other. Any way, the photographer might well be excused if he were a little nervous in the presence of a lion, while the latter, fatigued at holding his jaws so long in one position, is to be pardoned if his muscles relaxed, and his teeth came in contact with the head of the fool-hardy lady. There are two reasons put forward as to why the animal closed his mouth suddenly. One is that he was startled by the magnesium flash, and the other that his fright was caused by the voice of the lady calling out to the photographer to make haste. However, it does not matter much which theory is correct. What is more important is, did the photographer get his negative? If he was successful, it is certain that Mdlle. Seinde has got a much more sensational picture for an advertisement than she bargained for. But on this point the papers are provokingly silent.

It has been the custom of the Patent department to send to applicants a notice of the latest time for filing a complete specification, in order that the grant of a patent may not be frustrated through oversight. But this custom is to be discontinued. An undated slip attached to last Saturday's Official Journal of the Patent Office reads thus:—"Notice.—The notices hitherto sent by the office to applicants for patents, reminding them of the date for filing a complete specification, will not in future be issued." Applicants for patents should take note of the above, especially as they may have become accustomed to receiving the notice.

One feature in connection with the really fine portrait of the Pope, issued this week with our Romanist contemporary *The Universe*, deserves note, and indeed imitation; the sheet on which the portrait of His Holiness is printed being also furnished with a small but excellent portrait of his father and also one of his mother.

The portrait of the Pope referred to forms an excellent example of wood-engraving and printing; and indeed, altogether, it is a work which every photographer will find worth obtaining, especially considering that it is issued as a gratis supplement with a penny paper.

There are points about the portrait in question which show conclusively that it is not copied from a photograph,



although it is quite possible that the artist may have been assisted in his work by a photograph, or indeed by several.

"What is it that often shows so distinctly that a portrait is a mere copy of a photograph?" may be asked; but the question is not a very easy one to answer in a dozen words or so; but that both photographer and artist often have the power of immediately recognizing a copy of a photograph, the following anecdote will illustrate.

A metropolitan educational society held a competitive exhibition of works of decorative art, and all members of the committee of judges present were in favour of giving the first prize to a stained window, in which the figure of a woman was the main feature. The secretary, who is a skilled amateur photographer, meekly protested that he felt sure the "work of art" in question was only a copy of a badly-lighted photograph translated into colour; but the committee consisted of men calling themselves artists, and they promptly sat upon the obtrusive secretary, and intimated that he might be a very good amateur photographer, but he did not show wisdom in expressing an opinion on a work of art. The most noted man of the committee—William Morris, artist and poet—had not yet arrived, and it was agreed to say no more on the question till his advent. He entered, and when one said, "What do you think of that for the first prize?" his only answer was, "Bad copy of a ———ed photograph!"

Now the secretary is a photographer, knowing nothing of the technics of art, and Morris is an artist, who is about as ignorant of the technics of photography as any person of general education can be; these circumstances giving point and significance to the incident.

Apart from the possibilities of bad lighting which may happen with the work of the artist, just as with the work of the photographer, the main difference between the portrait made by the camera, and the portrait constructed by the skilled artist, rests on the fact that the camera records as it sees during the short period of exposure, and records only one phase of those ever-changing aspects which, averaged, give us the impression of a face; while the skilled artist secures a resemblance which shall be an average or composite of the more important of the various expressions.

To illustrate this, we may refer to the instantaneous photograph of a revolving wheel, which shows the wheel as still, to some of the photographs of a jumping horse, which show attitudes which no eye ever saw or can see, although these attitudes may be true in a certain sense: that is, true, as representing a minute phase of the longer representation which would be the whole truth, or the real truth.

When Muybridge's single phase photographs of the jumping horse were united by successive projection on the

screen, we obtained the whole truth, or something very near this. Similarly, by skilfully uniting several portraits of the same person according to Galton's method, we may obtain something near a "whole truth" in photographic portraiture.

Man, in all stages of his development, may, we think, be fairly called a "collecting animal." Even in a savage state he has a taste for accumulating various articles. Thus, if he be a Dyak he probably takes to collecting his enemies' heads; while if he be a North American Indian, he is content with a collection of their scalps. And when once he has become civilised it would be easier to name the things he has not collected than to attempt to furnish a list of those he has. Most of us have collected stamps, or coins, or crests, or bird's eggs in our time, and there are at the present moment tens of thousands of our fellow-countrymen engaged in collecting anything and everything you can think of, from newspaper headings to old ships' figure heads; from snuff-boxes to dinner menus. Why, the other day it came out that a Yorkshireman was devoting his life to collecting what he called "historic stays," and he had just been fortunate enough to purchase a corset which had belonged to the authoress of "Jane Eyre" for three-and-sixpence. Another man, a Parisian, is collecting old boots, and we heard of an eccentric individual but yesterday who is collecting coloured posters.

"But what has this to do with photography?" it may be asked. Simply this. Thanks to the introduction of the camera, a wide field is opened up to the collector. Photographs themselves as photographs are, of course, very widely collected; but now that amateur photography is spreading so much, many collections of various sorts of things of which negatives can be obtained, are being also accumulated. Thus, one amateur photographer collects only views of churches; a second goes exclusively to the dogs for his collection; whilst a third collects portraits, more or less "striking," of his friends' hands. But we were shown a really interesting collection recently, and, so far as we know, a novel one. It was an album fitted with photographs of quaint inn sign-boards of divers kinds. And this notion suggests the collecting of photographs of curious gravestones and epitaphs by those who do not object, like Hervey, to "meditate amongst the tombs."

## Reviews.

A TREATISE ON PHOTOGRAPHY. By Capt. W. de Wiveleslie Abney. Fifth edition. Price 3s. 6d. (Longmans, Green, & Co., 1888.)

WE have here a practical handbook of photography, but with enough of theoretical instruction to satisfy the photographer who desires to know something of the inner working of the processes with which he is concerned; and being concisely written it forms an admirable book of reference.

The work opens with a short account of the historical development of the art of photography, this occupying six pages, after which four pages are occupied with some account of the most fundamental experiments with light,



after which come eleven pages devoted to "The Theory of Sensitive Compounds," and thirteen to an account of the action of light on certain bodies.

The fundamentals being thus laid down, we come to the more practical part of the book, commencing with the Daguerreotype, and passing on to collodion, details of working the wet process and positives by the bath method, these items bringing us up to page 87.

The dry processes are now introduced by a study of alkaline development, after which the collodion dry methods are brought under review, and then two chapters are devoted to the gelatino-bromide process. A chapter on paper negatives which follows is very useful and complete. And this, with two chapters on silver printing, covers the everyday photographic ground.

The remaining subjects treated of are citro-chloride processes, iron or uranium printing, platinotype, printing with chromium salts, photo-lithographic transfers, photo-engraving and relief methods, colotype, elementary photographic optics, apparatus, "the picture," photo-spectroscopy, effect of the spectrum on haloid salts, reversing action of light, orthochromatic photography, light for the dark room, actinometry, celestial photography, photography with the microscope. Some tabular matter completes the work.

This work, consisting as it does of 368 pages of well-digested and comprehensive matter, neatly printed and conveniently bound, forms a handbook which will, doubtless, soon become a common object on the shelves of the photographic worker, whether he be an amateur or a professional.

#### KERAUNOGRAPHY.

BY HENRY E. DAVIS.\*

WERE it my desire to do so, I have not the knowledge to enable me to offer you a scientific paper on the subject appointed for to-night's meeting. I simply intend to present to you a somewhat inconsequent compilation in, I hope, a sufficiently interesting manner, of a few notes of observations on "Lightning Prints," collected from various sources, a subject which has gradually emerged from the mysterious traditions of the early ages until it has reached the bed rock of modern scientific investigation.

There is much that is attractive in the subject. With interest we may trace the gradual increase of the reliability of the records from the clouded exaggerations of the earlier historians till we reach the latter-day plain and accurate descriptions of the phenomena, and of the methods by which they are more or less nearly repeated in the laboratory, especially with regard to the apparent prospective utility of such reproductions of these forces to the photographer.

Franklin and Dalibard long ago identified lightning—the most common of meteoric effects—with the spark produced by the electrical machine, and on this identity are founded the very interesting laboratory experiments previously referred to. Among the many notable manifestations none are more so than the impressions or counterparts or silhouettes of certain objects on other bodies, thus producing to some extent the action of light on sensitised substances. Although for long such effects of the lightning flash were regarded with more or less incredulity, or at least doubt, the observations of the last half century have fully confirmed their existence and their frequent recurrence, and established a field of work which has well-merited the careful investigation which it has now for many years received from the world's leading scientists.

Keraunography is the term allotted to these writings or pictures founded on the Greek word *κεραυνός*, meaning lightning, and many records have for ages been made of instances of their occurrence and the circumstances thereof more recently compared.

Among those who originally made special investigation of the subject may be mentioned the Right Hon. Sir W. R. Grove, Senor Poey, formerly chief at the Havana Observatory, Dr. Boudin, and Barou Firmas in France, and Professor Orioli in

Italy. The first historic record is believed to be that by St. Gregory of Nazian, who was contemporary with the Emperor Julian, and relates that when the latter had permitted the Hebrews to rebuild the Temple, a storm raging during their occupation drove them to shelter in a neighbouring church. During the storm globes of fire were seen to proceed from the earth, and the sheltered labourers had reproduced on their persons and garments prints of the cross which was in the church, which were dull or invisible in daylight, but luminous in the dark.

It is probable that these statements may be an example of the legends which the priestly chroniclers were so ready to form by exaggerations of actual facts in their enthusiasm for the spread of their views, but we must be well contented to be nowadays compelled to carefully examine their statements under the aspects of modern criticism, when we remember how much of the recorded history of the world since Rome's fall we owe to their chronicling.

Wm. Warburton, in 1750, refers to St. Gregory's account, and credits the statements as to the luminosity, or non-luminosity, according to the power of the light to which the images were exposed, and likewise states that Rufin and Socrates acknowledge such impressions to be fixed and indelible by any means. He further accounts for the form of the cross by the erratic march of the spark, which, when not clearly observable in scintillation, might easily be mistaken for a cross; but as will be mentioned further on there is no difficulty in accounting for the crucial form if a cross at any distance stood in the church. And so indubitable and frequent have been the more recently recorded circumstances of a somewhat similar nature, that it has long been an established fact that such effects are produced with more or less intensity. It is advisable, in examining such a subject, to reserve our attention for more modern and reliable instances, and we have, fortunately, many such fairly authenticated, dating within the last 250 to 300 years.

In the *Adversaria*, Casaubon mentions such a case, on the faith of a statement made by the Bishop of Wells in 1595. Violent claps of thunder were accompanied by lightning which apparently harmed none of his assembled congregation, but subsequently crosses were found imprinted on various parts of their bodies, one being found on the Bishop's own arm. In 1660, during the eruption of Vesuvius, Father Kircher records, in a long dissertation with a very long Latin title, that crosses were seen marked on various articles of apparel which were exposed during the movement. Pure water failed to remove the marks, but soap and water, he states, did so. This latter circumstance seems contrary to the usual experience of these markings, and is rather contradictory to his statement that some of these marks remained many weeks, unless the people of Naples were unaccustomed to wash themselves. Nothing is said as to the flashing of lightning during the eruption, but atmospheric disturbances are mostly coexistent with such perturbations, and the excitement of the locality may have been such as to induce electric discharges from the mountain.

A curious case occurred in 1639, when a church at Langy was struck and some words of a Prayer-book were impressed on the altar-cloth; the printing of the book being in red and black, those words only in black were shown, but reversed.

We come now to the time when really reliable data can be found. Franklin communicated to Leroy that about 1750 a man saw a tree opposite him struck by lightning, and found a reversed impression of the tree indelibly defined on his breast.

In 1812 Mr. Shaw communicated to the Meteorological Society a most peculiar case. Six sheep lying in an open pasture surrounded by woods were killed by lightning; the surrounding landscape was pictured so clearly on the inner surface of each skin that the view was immediately recognisable by those who were acquainted with the district. These skins were actually exhibited publicly at Bath for some time.

The instances collected by the before-mentioned Senor Poey in Cuba are very numerous; from these I select two or three of the more interesting. A man sitting at a table on which a piece of money lay, received at the moment of a lightning discharge an impression of the coin on his arm which rested on the table. This occurrence is not described with sufficient clearness to show us whether the arm was in contact with the coin or not, which it would be interesting to have known, as if the arm was not resting on the coin the discharge must have been deflected to the arm, and may show some evidence of a special attraction of the living body for the current if within a certain radius.

Another man riding through the bush and overtaken by a

\* A Communication to the Photographic Club.



tempest was impressed with the image of a cross on the breast, reproducing one of metal which he wore there, but which was undiscoverable when he recovered from the shock.

Now for the cat. You remember that in the *British Journal of Photography* three weeks ago a jocose paragraph, extracted from an American paper, described the marking of a black cat on a farmer's bald head to the dismay of his household. In the incident I am about to mention the cat was the marked one. Having been killed by a stroke of lightning which had previously struck a building, on the corpse was found a reduced facsimile of a circle which was on the building. Professor Francesco Orioli's work, published in 1824 at Bologna, in a collection of scientific papers by various authors, contains, perhaps some of the earliest scientifically valuable notes on our subject. He was gifted not only in science, but also in political, social, and art matters, on all of which subjects his energetic pen and eloquent tongue gave contributions of much value. I was amused in looking over the list of his works to find an address in memory of Daniel O'Connell dated 1847. He was the author of a new method of observing the most minute electrical currents, and seems to have been a most versatile student.

(To be continued.)

## Patent Intelligence.

### Applications for Letters Patent.

- 1,291. CHARLES HENRY STANBURY, 24, Southampton Buildings, London, for "Improvements in dark chambers for photographic purposes."—Jan. 27, 1888.  
 1,359. JOHN EDWARD THORNTON, 3, New Lorue Street, Moss Side, Manchester, for "Improvements in photographic cameras."—Jan. 30, 1888.  
 1,466. REGINALD HADDAN, 18, Buckingham Street, Strand, London, W.C., for "Automatic coil freed apparatus for photographing and delivering of photographs."—(Juan Canto, Spain.)—[Complete Specification.]—Jan. 31, 1888.

## Correspondence.

### BACKGROUND ARRANGEMENTS.

DEAR SIR,—I observe in your issue of January 13 that Mr. L. W. Seavey, of New York, has patented in the United States of America a supporting frame for photographic backgrounds, the active part of which seems to resemble in principle a machine invented by me for the same purpose patented in Great Britain, France, and America, and sold as Morgau's Improved Multiplex Photographic Background Frame.

The principle of construction in Mr. Seavey's supporting frame, although wanting the time-saving and space-economising mechanical arrangements that are in my machine, is yet sufficiently like mine in appearance as to be at the first glance mistaken for it.

Whether Mr. Seavey has infringed my Patent has yet to appear; in the meantime, the accompanying illustration and description of claims will enable your readers to form their own comparison.

The combination of the frame and a rotary holder with rollers journaled in the holder, and each carrying a background and a locking spindle to retain the holder in the position to which it has been moved.

The combination of the frame and a rotary holder with rollers journaled in the holder, and each carrying a background, a vertical spindle geared to the holder, and a locking spindle to retain the holder in the position to which it has been moved, substantially as specified.

The combination of the frame and a rotary holder with rollers journaled in the holder, and each carrying a background and a sliding spindle in the frame adapted to engage with the journal of any roller, and carrying a pulley, as and for the purpose specified.

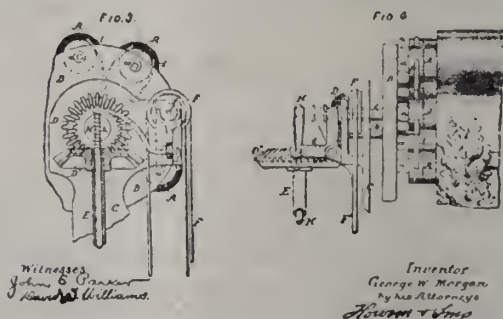
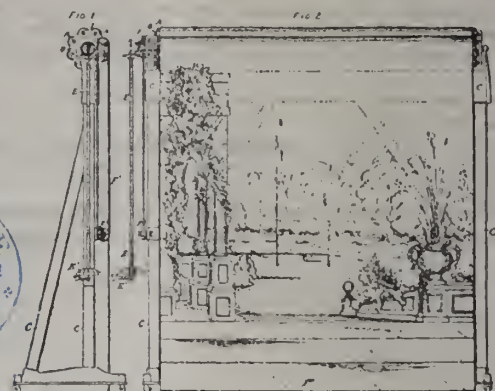
The combination of the frame, rotary holder, and background, rollers, journaled in the holder with a vertical hollow spindle E, geared to the holder, and having a handle E', a sliding spindle f, bell crank g, spindle H, and operating hand lever, all substantially as described.

G W MORGAN.

MULTIPLEX PHOTOGRAPHIC BACKGROUND.

No. 362,390.

Patented May 3, 1887.



In the accompanying illustration, fig. 1 is a side elevation, and fig. 2 is a front elevation of my Improved Multiplex Photographic Background Frame. Fig. 3 is a sectional elevation on an enlarged scale of part of the rotating ease and operating mechanism; and fig. 4 is a side view of the same.—I am, dear sir, yours truly,

G. W. MORGAN.

### AMATEUR AND PROFESSIONALS.

SIR,—As if the business of the professional photographer was all sunshine; as if he had spent no money in plant, in lease of premises, or in alterations, adapting them for his purpose; as if his staff, if he have a good business, require no payment, or as if his children are without appetites; as if his work, from sparseness, can all be done by himself and wife; as if, in fact, it is a matter of indifference whether the professional shall get a living or not, Lord Robert Grosvenor suggests that we amateurs shall work for money, and give it to an orphanage at Kilburn; plainly put, that we will take portraits of our friends for money, and give it in the direction indicated.

I fear, Sir, his lordship, however good his intentions, does not look all round or very deeply into things. When told by the writer of a well written letter he would make enemies of the profession, he mildly asks, "Are we making enemies of Downey, Mendelssohn, Lafayette? Are we drawing their customers away?" As if these three prosperous men were a fair sample of the thousands who have homes to maintain by the business of photography!



This, Sir, is a matter for others than amateurs to know of and to speak up about; and it is because the News is much read by the profession I call attention to it by asking the insertion of this letter from

Melton Mowbray, Feb. 7th, 1888.

WM. ADCOCK.

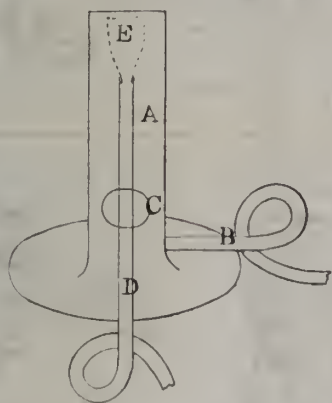
### THE FLASH LIGHT.

DEAR SIR,—The "flash" light seems to be so extensively used just now, that perhaps you may think it worth while to publish even another method of igniting the magnesium powder. Lighting it with a paper I have not found very satisfactory, and electricity is costly and troublesome.

A is an ordinary  $\frac{3}{4}$ " Bunsen burner, of which B is the gas pipe, and C the air inlet.

Through C is pushed a length of  $\frac{1}{4}$ " rubber pipe, D, the end of which is fixed on to a piece of glass tube, E, drawn out as shown.

Having first dropped a pellet of paper into E to prevent the powder falling down the rubber pipe, the charge of



magnesium is poured in, the burner lighted and placed in position with regard to the sitter, and when all is ready, a slight blow through D will send the powder through the flame, and make a long blaze of light.

I find that very little magnesium is required by this method, five grains giving quite sufficient exposure at a distance of eight feet.

If the glass E is drawn slightly below the level of the Bunsen tube, the gas may be lighted for any length of time without any fear of the powder "going off."

If the light is wanted in more than one place at once, as many burners as are required may be lighted, and charged with powder, and the rubber tubes so connected that one blow will set them all off. I have only used two burners at once, but the flash is at absolutely the same instant from them both. Hoping this plan may be of use to you,—Yours truly,

R. HOLDEN DAVIDSON.

### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN ELECTION.

SIR,—In a letter which you were good enough to publish in your issue of the 13th ult., I ventured to prophesy that, as the names of the nominators were to be published, there would be "at this, as at former elections under the same regulation, a combination of a small section of the Council to secure the election of gentlemen likely to support the present very unsatisfactory state of affairs." This as a prophecy, has, happily, turned out a failure. The balloting paper is, however, an example of another great evil of the system. The publication of the nominators has deterred all but a few from exercising their right of nominating.

Captain Abney's contention that some responsibility

should attach to nominators is a very just one, and those who differ from him on other points agree with him on this. It is of course necessary that the Society should have some safeguard against the nomination, for malicious reasons, of persons obviously unsuited for office, and against such childish impertinences as the nomination of the whole of the members of the Society; but the number of members who could be guilty of such conduct must be very small, and surely a means might easily be found for dealing with such. Even if the publication of the nominators were the only way out of the difficulty, there is no reason why this publication should take place before the election, and thereby introduce an evil greater than that it is intended to remedy.

Captain Abney argues that a combination of members of Council to secure the election of their friends is not only justifiable, but desirable. He also argues that the election should not be in the hands of the London members and those who attend the meetings. As it is these who know the requirements of the Society, and who may be safely trusted to choose representative and business-like men, it certainly sounds a very strange argument, and it is only natural to ask, if not to those who take part in the proceedings of the Society, to whom should the election be entrusted? To this, a most explicit answer may be gathered from Captain Abney's letter. The country members cannot be supposed to know the merits of every individual who is nominated. Unless guided they would probably not vote. They form a large majority of the members, and are guided by the names of the nominators. There is only one possible inference to be drawn. The nominators are to control the election.

I venture to think that this doctrine will be no more acceptable to the country members than to the London ones. The Society is, happily, not divided into a town party and a country party, but the members as a whole recognise that their interests are identical, and their chief present interest is to establish a good government. Under the system which Captain Abney advocates, and which has, unfortunately, been in force for years, the government of the Society has become a bye word for inactivity and imbecility, and the Society has, from being recognised as the leading Society in our country fallen to its present degraded state. Let us then try a different system under which each man may vote according to his opinion, and without being prejudiced, and let those who have no opinions of their own leave the matter alone. Under the blessing of a representative and responsible government, we may hope to regain that position which our rulers ought never to have lost for us.—I am yours, &c.

A. MACKIE.

### TYLAR'S METAL DARK SLIDES.

SIR,—Referring to Mr. Tylar's letter in the PHOTOGRAPHIC NEWS last week, it is quite true that I wrote to him when my attention was first called to the matter, giving him full particulars of the publication of my description in your pages, also in the *British Journal of Photography* for 1879, and the *English Mechanic*, and having got thus far it occurred to me that it was just possible, after all, that he might have re-invented it, and if so, as I should be sorry to injure an innocent man, I suggested that he might acknowledge the appropriation in some trifling manner as stated, thinking that if he did so it would leave me the right to make and use my own invention without question. I do not regard such as a "gift," and had they been sent I should not have used them, because they are too wide and too long for any of my cameras.

His reply, however, did not satisfy me that he had re-invented it, inasmuch as he first stated that mine could not be made light-tight, and then went on to say that it was the same as one shown by Mr. James Melhuish at the London Society about 1857 or 1858, which showed



that, if young as he now states, he had, at all events, read up the literature of the subject, as is usual and necessary with patentees if their patent fees are not to be wasted; and I therefore advised him by return post that I was going to ventilate the matter. Apart from this, the memorandum upon which he wrote me had an illustration of his slide, showing it fastened together at the end by a hinge—practically, an exact reproduction of mine, with the hinge on the end instead of the side, but more cumbersome in proportion to size of plate used.

Mr. Tylar also enclosed me a list of his goods, amongst which I noticed his folding developing, &c., trays, under which is printed "Patent applied for."

This same article was described by Mr. Whaite, on page 31 of your YEAR-BOOK for 1884, and I presume Mr. Tylar is old enough to have some knowledge of this: or is it also a case of re-invention? He asserts that my description is that of a mere toy. Had he carefully perused it, and sundry notes in your YEAR-BOOKS previous to 1879, he would have seen why I was using so small a size; but surely even a young man should be able to understand that what will keep out light in a small size, will do the same in any if the material is duly strengthened in proportion. This, however, is all beside the question I raised.

What I state is that his "invention" (?) is practically that described by me seven years previous to his patent. Anyone choosing to compare his with the drawings in the *English Mechanic* can see this for himself; yet Mr. Tylar's only way of meeting this is by suggesting that what I described, and put into practice years before him, was allowed to remain dormant, and confined to theory, and to insinuate that because he has patented and advertised it without previous opposition or protest from myself or others, his patent is to secure it to him against all comers. If such is his notion of the "Patent Laws," and the duties of patentees, it is certainly not that of persons of greater experience.

He now further states that he makes slides with the shutters to draw entirely out; if so, he has already found out that what he patented as his "self-locking" arrangement, to prevent withdrawal, is, even if valid, a useless arrangement. My object is not to stop the sale of the article, but to assist it by pointing out that, his patent notwithstanding, it is open to anyone to make and sell it.

It is not my intention to assist Mr. Tylar to gratuitously advertise his goods by continuing this correspondence, and therefore, unless some new point is introduced, this is my last word on the subject in your pages.—Yours respectfully,

RICHARD PARR.

## Proceedings of Societies.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE annual dinner took place on the 2nd inst. at Masons' Hall Tavern; W. H. PRESTWICH occupied the chair.

After the usual loyal toasts, "Prosperity to the London and Provincial Association" was proposed by the Chairman, and responded to by the Hon. Sec. (J. J. Brigginsshaw), who referred to the growing interest taken in the Association—proved by the letters he received from home and foreign correspondents—the good work the Association had done, and its prospective arrangements. These, he stated, would include, on the 9th inst., a paper on "Silver and its Salts," by Dr. Louis, F.C.S.; on the 16th, a paper by A. Pringle—"Photo-Micrography with Medium and High Powers"; on the 23rd, an exhibition of hand-painted transparencies by artists of high repute, dating back to the earliest known hand-painted slides; and on the 8th prox. a smoking concert will be given. The other toasts included "Kindred Societies," proposed by J. Traill Taylor, responded to by W. Cobb, A. Cowan, H. Fry, J. Hubert, A. Mackie, and H. Trinks; "The Photographic Convention of the United Kingdom," replied to by J. B. Wellington, C. P. Cembrano, and

J. J. Brigginsshaw; "The Officers," responded to by A. Haddon. "Absent Friends" was proposed by D. Allen, the name of A. L. Henderson being specially associated with this toast, to which J. Traill Taylor replied. The health of the Chairman, proposed by J. J. Brigginsshaw, and briefly responded to, brought the proceedings to a close, which throughout were enlivened with songs and recitals by E. Sollas, A. Cowan, W. Cobb, J. J. Brigginsshaw, A. Fry, J. Johnson, and D. W. Allen.

### CAMERA CLUB.

ON Thursday, February 2nd, the first exhibition of the slides sent by American photographic societies in this year's exchange with the Camera Club was given. There was a large attendance of members, and the meeting was greatly diverted and interested by the variety of transparencies shown. The slides appeared to be chiefly on gelatine bromide plates, and treated principally of woodland and streamlet scenery. Amongst the most effective of the slides were "A Berkshire Road," by George Bullock; "Ice Hills, and Davis Island Dam," by E. J. Carpenter; "In the Woods," by T. B. Collier; "Little Red Riding Hood," by H. F. Farny; also pictures by Messrs. Hunter, Huntington, Johnston, Kelley, Petitdidier, Smith, Becker, Murray, Frisbie, and Lawrence. Those by E. B. Johnston were of most noticeable quality.

The subject on Thursday, February 16th, will be "Negative Films. Several of the new introductions will be discussed, and the meeting will be opened by Colouel Verney, with his experience of the new Vergara film (Froedman's patent), at 8 p.m.

### CARDIFF AMATEUR PHOTOGRAPHIC SOCIETY.

THE ordinary fortnightly meeting of this Society was held at their rooms, Working Street, on Wednesday evening, the 1st inst., H. DYER in the chair. Wm. Skinner and Wm. Windsor were elected ordinary members.

The lecturer for the evening was H. J. Gifford, of the Camera Club, who took for his subject "Rational Development." The different formulæ at present in use were carefully analysed and criticised, but in such a clear and concise manner as to be readily grasped by his audience.

The next meeting will be held on the 15th inst. in the lecture theatre of the University College, when C. H. James, of Merthyr, will lecture on "A Tramp through Norway," photographically illustrated by limelight.

### MANCHESTER AMATEUR PHOTOGRAPHIC SOCIETY.

THE third annual meeting was held on Tuesday evening in the Lecture Hall of the Athenæum, the Rev. H. J. PALMER, the President, in the chair.

The Council, in their report, congratulated the members on the continued prosperity of the Society. The increase in the number of members is exceedingly gratifying; eighty-five new members (including five ladies) have joined the Society during the past year, making a total of 244. Of this number the Society has lost twenty, eighteen from removal and resignations, and two from death, leaving a net total of 224 members. This rapid increase in the membership has necessitated the removal of the Society's meetings to a larger room. The Council have, therefore, engaged the large lecture hall of the Manchester Athenæum for the future meetings. This lecture hall will accommodate over 500 persons, so that members can now invite visitors, as they are entitled to do. The treasurer's account showed a balance in hand of £17. This is very pleasing when compared with the balance, three shillings, left from last year. During the past year the Council, supported by an influential list of guarantor members, have started a quarterly magazine as the organ of the Society, with the registered title of *The Photographic Record*. Two numbers have been issued under the editorship of William Stanley, and have had a most gratifying circulation. The library now contains 126 volumes, and comprises most of the standard works on photography published to the present time. It has been largely used during the year, 212 volumes having been issued by the librarian. This is a healthy sign, and indicates a desire on the part of the members to obtain the best information on photographic matters. Fifteen shillings and sixpence have been received for fines, part of which has been expended on new books, and it is intended to appropriate all moneys received from this source to similar purposes. The number of books has been added to during the



year. The Council recorded the formation of a lantern slide cabinet, and presents of slides had been made by S. E. Flower, J. S. Watson, and J. A. Furnival. The attendance of members at the various meetings had been good, considering the many counter-attractions of the year. The first four lady members of the Society were elected in May last.

The following were elected as officers:—

*President*—Rev. H. J. Palmer.

*Vice-Presidents*—S. F. Flower, J. Davenport, J. W. Wade, H. S. Smith.

*Treasurer*—J. G. Jones. *Hon. Secretary*—F. W. Parrott.

*Librarian*—G. Wheeler.

*Council*—J. Furnival, R. B. Wilson, J. H. Seed, J. Whitham, G. H. Rigby, T. M. Brooks, C. Dawson, G. J. Crippin.

*Auditors*—J. Bathe and W. W. Dawson.

#### DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

The fifth monthly meeting of the session was held on Thursday last in Lamb's Hotel, Mr. MACDOUGALD, the President, in the chair.

A competition of lantern slides was held; four members competing, six slides in each set. The result of the voting of the members present, ten points being the maximum given to each slide, was as follows:—V. C. Baird, 655; A. Stewart, 564; W. Salmond, 505; and W. Baxter, 454. A demonstration of developing a Vergara film was then given. A specimen negative sent by the company was also thrown on the screen by the lantern. The absence of grain in these films was commented upon.

The following inquiry was found in the question box:—"What amount of sulphite of soda should be used in the developer?"

The meeting seemed divided as to the advisability of using it with the ammonia developer, but it was considered an improvement when used with either the carbonates of potash or soda. Four to six grains of sulphite of soda to each grain of pyro was recommended. The convener of the Charity Entertainment Committee reported that five lantern exhibitions had been given, the following institutions having been visited:—The Dundee Royal Infirmary, the Mars, the East Poorhouse, the Dundee Convalescent Home, Barnhill, and the Dundee Royal Lunatic Asylum, West Green. These entertainments were very much appreciated by the inmates of the several institutions. The thanks of the Society are due to Messrs Feathers, Lowden, Valentine, and several of the members for the use of lantern slides.

The joint secretaries for the forthcoming exhibition reported that the number of entries already received exceeded that of the exhibition of 1886, and as many of the leading professional and amateur photographers are to send exhibits, a first-class display of representative work may be expected. The exhibition is to be held in the galleries of the Albert Institute, and will be opened on Thursday, Feb. 16th.

#### SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

The regular monthly lantern exhibition was given at the rooms of the Society, 122, West 36th Street, on Wednesday evening, January 25th, and was very largely attended.

The subject was "The Other Half—How it lives and dies in New York," and was explained in an informal way by Jacob A. REISS, who for ten years past has been the police reporter of the *New York Press*. The object of the exhibition was to picture to the audience the exact condition of the lowest phases of life as at present exists in New York city. Many of the pictures were obtained by the aid of Dr. Piffard's flash magnesium light. The exhibition opened with a view of a well-known Abbey in Cherry Street, around which it was said 1,000 persons lived. Other views included the "Baudin's Alley," near Mott and Hester Streets, where murderers and thieves congregate and enjoy life in what is known as the "stale beer dives."

"Bottle Alley," near Baxter Street, contained many children.

A capital picture was that of an old tramp and thief in front of his broken down shanty. About this Mr. Reiss said he obtained the consent of the tramp to stand for 10 cents, but he put his pipe in his pocket. So the tramp struck for higher pay, and on giving him 5 cents. more he posed with his pipe, as Mr. Reiss desired.

Another excellent picture illustrated how young boys first practise picking pockets. The object of attack was a drunken

man lying down in a stupor. The two boys were on each side overhauling the pockets with decided energy. They term the pickings their winnings—never call it stealing. At a place called "Hell's Kitchen," near 11th Street, on 39th Street, they experienced considerable difficulty, and were attacked by some of the women with brick bats, which broke one of the plate-holders.

The Italian Rag Pickers' Alley, in South Fifth Acre, was shown. The women at work were suddenly dispersed by one word from the Italian proprietor before their picture could be caught. An Italian tea kettle was shown, somewhat large in size, stuffed with dirty linen. In the morning the kettle was used as a boiler for boiling the clothes; at night it was employed for making tea.

A typical group of New York roughs, called "The Growlers," was exhibited, hidden away under one of the damp docks on the east side. They were factory hands, and got young boys to go after beer, which they would drink in these places. A single picture of a young lad eight years old, carrying a large pail of beer, was quite effective. Other views of the back of tenement houses, showing the multiplicity of clothes' lines of Baxter Street, crowded with humanity, of Mott Street and Pell Street, showing Chinese life, the interior of a Chinese opium den, with the Chinamen laying off in their bunks under its influence, of the Chinese altar in the Joss House, some of the latter being taken by aid of the flash light, were extremely interesting. Also pictures of the interior of the cheap lodging-houses, the Tombs, the Five Points, House of Industry, the Catholic Protectory, with children playing around and Sister Drew in the foreground, who is said to have saved 1,300 children; also the exterior and interior of an up-town branch of the Boys' Lodging House of the Children's Aid Society, established through the beneficence of the late Mrs. Robert L. Stuart. All of the above were exceedingly interesting, as showing the saving power these institutions exerted. Portraits of children side by side, of how they looked when taken from their hovels and cruel and wretched parents, and after they were cleaned and cared for by Mr. E. Gerry's Society for the Prevention of Cruelty to Children, illustrated more forcibly than any word picture the necessity and usefulness of that Institution.

Several interesting portraits of noted thieves and forgers, both male and female, taken from the Rogues' Gallery, were shown; ex-Governor Moscos, of South Carolina, had the handsomest looking face. A fine picture, showing four or five detectives holding a refractory thief while he was having his photograph taken, was quite comical. A good interior of a police office, showing the sergeant recording the facts, with the policeman standing near the rail, holding a foundling wrapped up in a black shawl, and messenger and others looking on, was quite effective and well lighted.

Several views of the Arabs in their hovels, in Washington Street, were exhibited. The women lay around on the floor, without any bedding, and were completely embedded and begrimed with dirt. These were secured by aid of the flash light, and here were also two or three excellent interiors of the Blind School for Blind Children.

The exhibition terminated with several excellent views of the New York Morgue, interior of Bellevue Hospital, exterior and interior of the Penitentiary on Blackwell's Island, of the Lunatic Asylum on Ward's Island, and of the Burying Ground at Hart's Island.

Mr. RUS related many interesting episodes and facts. It was hard to realize the enormity of the degradation and poverty constantly present in the great City. He remarked that 4,000 children were barred out from the public schools because there was not room enough to accommodate all who could attend.

## Talk in the Studio.

**INFLUENCE OF LIGHT ON THE HEAT CONDUCTIVITY OF SELENIUM.**—By M. Bellati and S. Lussana (*Gazzetta*, 17, 391-405).—The analogies of heat and electric conductivity induced the authors to study the influence of light on the heat conductivity of selenium, the electric resistance of which, as is well known, is diminished on exposure. The plan of experiment consisted in sprinkling the double iodide of copper and mercury on the disc of selenium, on which a circular figure had been blackened with Indian ink. The selenium was heated by the passage of an electric current, which produced at first a dark spot, owing to the



change in colour of the double iodide. This subsequently extended into a fairly regular circular figure, the measurement of the diameter of which afforded a means of determining the heat conductivity of the selenium. This method was found to be more practicable than the usual method of melting wax. In all cases, the diameter of the circle was greater when the selenium was exposed to reflected sunlight from which the greater part of the heat rays had been removed by passage through solutions of alum and of ammoniacal copper sulphate. The relation of heat conductivity without and with exposure to light was found to be in the ratio of 1 : 1.1 as the result of several concordant experiments.

**EFFECT OF LIGHT ON THE CONDUCTIVITY OF SELENIUM.**—By S. Kalischer (*Ann. Phys. Chem.* [2], 32, 108).—Of the selenium cells constructed by the author, three in which copper and copper-brass electrodes are used, are found to differ from the rest in their behaviour on exposure to light, the resistance rapidly increasing after undergoing a momentary decrease, and the cell only returning to its normal condition on remaining for some time in the dark. The conclusion drawn from this is, that the cells in question contain a hitherto unknown modification of selenium, the conductivity of which decreases instead of increasing under the action of light. As the author's other cells which do not exhibit the peculiarity described, differ from the above in having zinc, copper-zinc, and copper-platinum electrodes, it still remains to be ascertained whether the nature of the electrodes has any influence on this behaviour of selenium. The phenomenon in question has also been observed and described by Hesehus (*Ern. Rep. d. Phys.*, 20, 490).

**PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.**—The annual meeting of this Society will be held on Tuesday next, Feb. 14th, at 8 p.m., at the Gallery, 5A, Pall Mall East, and the adjourned discussion upon stereoscopic work will be taken; the Gallery being opened at 7 p.m., for the inspection of stereoscopic exhibits, including (with others) those not seen at the last meeting; also the special general meeting (for new laws) held on December 13th, which stands adjourned, will in due course be resumed at the annual meeting.

**BOLTON PHOTOGRAPHIC SOCIETY.**—The monthly meeting was held at the Baths, Bridgman Street, on Thursday evening, February 22nd, R. Harwood in the chair. E. Greg, T. S. Dowson, W. L. Entwistle, and H. Boyle, were balloted for and unanimously elected members. After a supper and a smoking concert, O. K. Dalton displayed a number of good framed photographs in platinotype, and Dr. Johnston a number of photographs.

**THE LITERATURE OF PHOTOGRAPHY.**—W. B. Whittingham and Co., writing from 44 and 45, Charterhouse Square, contradict W. J. Harrison's statement, that the *Charterhouse Photographic Art Journal* is the organ of the Photographic Artists' Stores, of 43, Charterhouse Square, E.C.

**WASHING PLATINOTYPES.**—Some correspondents have written to us to enquire the cause of the yellow colouration of their platinotypes. It arises from the excess of the salts of platinum and iron with which the paper is impregnated. The prints may be restored to their original whiteness by thoroughly washing them in a bath (from three to four and a half fluid drachms of acid for one quart of water), which is to be renewed until the prints have again become entirely white. They are then rinsed in pure water, changed several times, until all traces of the acid entirely disappear, which is easy to ascertain by using litmus paper. If all acid reaction has not disappeared, it might end by injuring the fibre of the paper and converting it into hydrocellulose. No alkaline reagent (carbonate of soda, carbonate of potash, ammonia, &c.) should be added to the waters of the washing, under penalty of precipitating in the pulp, in the state of carbonate or ochreous oxide of iron, the chloride of iron that has remained in the paper.—*Journal de L'Industrie Photographique*. Translated in *The Philadelphia Photographer*.

**WATER GAS.**—Recently, under the auspices of the Society of Chemical Industry, Alfred Wilson lectured at the Mason College, Birmingham, on "Water Gas for Heating and Illuminating." Mr. Wilson described generators for the manufacture of water gas, such as are now in use in some European cities, principally in Germany and Austria, for the melting of steel and also for illuminating purposes. The fuel employed for making this kind of gas is coke, of the kind which remains at gas works after the illuminating gas of everyday use has been abstracted from the coal. The method of producing gas is as follows:—A cupola-

shaped furnace is employed, in which the coke is raised to an incandescent heat by means of a blast of air. When it reaches that temperature, steam is passed through it and suffers disintegration, with the result that an inflammable mixture of hydrogen and carbonic oxide is obtained. The mixture is then passed through a water-scrubber in the ordinary manner, and thence goes to the gas-holder. It is burnt as an illuminant with the aid of a new incandescent burner, known as the Fahnejeim, having a magnesia cone, and is so brilliant that a No. 3 Bray burner gives a light equal to that of twenty sperm candles of standard make. Its cost is understood to be about sixpence per 1,000 cubic feet.

**PHOTOGRAPHIC CLUB.**—The subject for discussion on Feb. 15th will be "Effects of Photography on Social Life," a paper by Mr. Cobb.

## To Correspondents.

\* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

**EMULSION.**—1. Use Simeon's gelatine. 2. Silicate of soda. 3. We cannot even guess without seeing one. 4. About 85 deg. Fahrenheit.

**J. C. STEPHENS.**—We are glad to hear that you are well, and still interested in photography. The newspaper paragraph you send is really copied—with certain alterations—from the PHOTOGRAPHIC NEWS.

**VARNISH.**—A small quantity of the light petroleum spirit sold as benzoline.

**NITRATE.**—Use less alcohol.

**PURCHASER.**—Complete sets of the PHOTOGRAPHIC NEWS in uniform binding are very difficult to obtain, and generally realise a fair price—from £15 to £25 is perhaps a reasonable estimate of what would ordinarily be asked. Odd volumes, on the other hand, can very often be had for two or three shillings in Booksellers' flow, or by advertising. Unbound hack volumes with a number or two missing, are practically unsaleable, unless at about 6s. per cwt., and we should certainly recommend you to buy nothing less than a whole volume at a time if you wish to gradually build up a complete set of former years.

**EDW. DYSON.**—We have seen nothing of the sample background to which you refer.

**W. POLTER.**—Quite an ordinary method, and the patent is valueless, except as a means of enabling a dishonest person to obtain a cheap puff.

**J. S. N. S.**—Use a filter to collect the precipitate; the tendency to float on the top is less when the solutions are mixed warm.

**ED. V. BOISSONAS.**—The photographs of the fireworks are curious and interesting.

**EDWARDS & Co.**—The corrected letter and the fresh one only reach us on Thursday morning, thus being too late. They shall appear next week.

**W. F. DONKIN.**—The error of date was in the note you sent us last week, and you will see that it has been corrected.

## Photographs Registered.

T. LEWIS (Birmingham)—Six photos. of Right Hon. W. E. Gladstone.  
JACKSON BROS. (Middleton Junction, Birmingham)—Photo. entitled "Duckstone."

## The Photographic News.

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# THE PHOTOGRAPHIC NEWS.

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### GRAIN ON COPPER PLATES FOR HELIOGRAPHIC ETCHING.

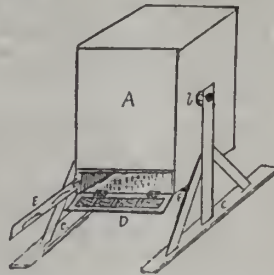
IN such processes of heliographic etching as that of Talbot, or the method generally known as the Klic process (see *Photographic News*, p. 49, vol. 1837), it is generally advisable, and often absolutely necessary, to produce a grain by dusting a resinous resist on the plate, before either coating it with gelatine or transferring thereto the gelatine relief which (in the Klic process) regulates the action of the etching fluid.

In the earlier times this resinous resist was often dusted over the plate by sifting the resinous powder over the plate from a sieve, or muslin bag, held some distance over it; but, nowadays, the far more satisfactory arrangement of a dusting box is employed—this consisting of a box in which the resinous dust can be agitated with the contained air, and a sort of drawer is provided by which the plate can be slid into the lower part of the box and withdrawn from the same at any period. Such a device gives one a very complete control over the grain, as it is obvious that if one waits until nearly the whole of the resinous dust has settled in the box, then inserting the plate, the grain will be extremely fine. If, on the other hand, the plate is inserted immediately after agitation, and is removed soon, the grain will be comparatively coarse; while if the plate be inserted as in the last case, and allowed to remain till all is at rest in the box, the grain will be mixed—that is, there will be fine and coarse particles with all intermediate grades. These are not by any means the limits of variation obtainable by the use of the dusting box, as by two insertions—one at the beginning of the settling, and the other towards the end—one may obtain two degrees of fineness on the plate, to the exclusion of the intermediate degrees.

Not only are the degrees of fineness under complete control, but also the amounts. Let us suppose, for example, that having charged the dusting box with the resin or asphalt powder, the worker finds, by a preliminary trial—say, on a piece of paper—that the degree of coarseness he requires is obtained by allowing the dust to settle on the plate during a period commencing half a minute after the agitation, and lasting ten seconds. It may be, indeed is, extremely probable, that the amount of dust deposited on the plate during this period will be insufficient, and, in order to obtain more of the same degree of fineness, the operation must be repeated one or several times until a sufficient deposit is obtained. Similarly, if a dense deposit of two grades is required, the two necessary periods after agitation must be selected; the operation being repeated the requisite number of times.

With regard to the dusting box, we may reproduce from p. 49 of our volume for last year a sketch of a useful form, together with the description.

"To make such a box, get a well-seasoned wooden box about four feet high, dovetailed and joined without crevices, including the top, which must be made a fixture; the internal dimensions of the bottom must be large enough to carry the largest-sized plate required to be etched, and the inside had better be French polished or papered with a surface-glazed paper. At one of the sides close to the bottom make a narrow door hinged to the bottom of the box. It should be framed and panelled to prevent its warping."



A, aqua-tint box with hard wooden spindles screwed into its sides at *b b*, to serve as axis on which it rotates; *c c* are stout wooden trestles fixed to the floor, and carrying the bearings for the spindles. D is the door, E the pressure bar with spring, and at F is a bolt to lock the box in an upright position.

To work successfully in the intaglio etching process, one must not only be able to control the grain, but it will be necessary to well consider the sort of grain suitable for the subject in hand; and, moreover, the extent to which the resinous powder is melted on the plate is an important factor in building up success.

Writing in Eder's admirable Year-Book, Oscar Pustet considers the sort of grain which is most likely to suit certain subjects, and he contends that in the case of large portrait-subjects and other pictures, when great depth is required, the grain should be coarse; whereas, small pictures and landscapes, where no great contrast exists, may with advantage be etched with a fine grain; and these considerations should recommend themselves to all.

A word as to the etching. In the deepest shadows, where the black of the ink should be almost unbroken, the etching ought to be continued till the grain-points almost disappear by the under-cutting action of the etching fluid (ordinarily perchloride of iron); indeed, until even with a magnifier only a minute trace of protected copper is visible. In some cases one may go a little beyond this; even until the surface of the plate is entirely lost in the deepest shadows, the roughness remaining from the retarding action of the resin giving the ink-holding tooth which is necessary.



## THE PROGRESS OF THE PHOTO-MECHANICAL PROCESSES IN GERMANY AND AUSTRIA.

BY HERMANN E. GUNTHER.

### No. I.

*Photogravure.*—There was a time, and it is by no means long ago, that we were in this country accustomed to suppose that only in France good photogravures could be produced; indeed, the old-established and renowned firm of Goupil and Co. seemed to be without any rival within this branch of art. This has now altered; at the last International Photographic Exhibition at Vienna, January 1887, we could convince ourselves that photogravure or heliogravure has advanced to a high state of perfection in

Germany and Austria, indeed that the results are at present quite as excellent as those obtained in other countries. Especially the photo-copper printings of V. Angerer and J. Loewy, of Vienna, of R. Schuster, the Photographic Society and the Imperial Printing House, of Berlin, and of the Military Geographical Institute and the Imperial Court and State Printing House, of Vienna, were of exceptional excellence. In photo-copper-plate printing we have to discriminate between methods by which a printing plate is obtained from a gelatine relief on a silvered copper-plate by means of galvanoplastic processes, and others by which a diapositive is printed upon pigment paper which is transferred upon a polished copper-plate and the image etched with perchloride of iron or diluted nitric acid. The former method is known by the name of



EXAMPLE OF RIFFARTH'S PHOTOTYPGRAPHIC PROCESS.

photo-galvanography, the latter as photogravure or heliogravure. Whilst photo-galvanography is very well suited for the reproduction of old cuts, engravings, drawings, and all line and stipple work, photogravure is to the present day undoubtedly the most perfect process for the reproduction of paintings, of photographs of natural objects, and of all subjects in half-tones. The photo-galvanographic process is on a gigantic scale practised in the Military Geographical Institute of Vienna, under the able direction of E. Mariot, exclusively for the production of maps and other graphic reproductions. As an astonishing result of this process I will only mention the new special map of the Austria-Hungarian Monarchy on the scale of 1:75,000, consisting of 720 plates of 20 by 24 inches each, which has been finished in fifteen years, whereas, had it been intended to execute the maps by

copper-plate engravers, generations would have been required to do the work, and the expenses would have been enormous. For photogravure, besides the above-named establishments, the firms of Obernetter and Dr. E. Albert, of Munich, and of H. Riffarth, of Berlin, are renowned. The process practised by Obernetter consists, as is well known, in transforming a diapositive taken on a gelatino-bromide plate into chloride of silver, in stripping the film from the glass plate, and in placing it on a perfectly even copper-plate. Corresponding to the intensity of the original negative, chloride of silver rests then on the metal surface, more of it in the darker portions, less in the lighter ones. Under the influence of an electric current, the chloride of silver decomposes, the chlorine combining with the copper, and etching the plate deeper where chloride of silver abounded in a high degree, and



less where it had been to a limited extent. The result is a grained photo-copper-plate, suitable to print large editions from, and giving very fine impressions. This process is a very rapid one: a printing plate ready for the press can be produced within a day or two. As regards the price, 2½d. is charged for the square centimetre, but no plate is made for less than 50s.; engraving of letters and outline being charged extra. The photogravure process of Dr. Albert, who prints his excellent diapositives on home-made carbon transfer paper, is in many points similar to the Klic process, which has been fully described in the YEAR-BOOK OF PHOTOGRAPHY for 1888, p. 171. In this establishment, as well as in the other ones, the photogravure process is practised on a very great scale, as we have in this country many important publishing houses by which photogravure is greatly advanced and widely used in the getting-up of their splendid works. The pro-

duction of a photogravure plate requires one to three months, according to its size and the difficulties it offers. The price in one of these establishments is £10 for a plate of 200 to 500 square centimetres, and £6 for a plate of less than 200 square centimetres.

*Phototypography.*—Giant are the strides made by phototypography in this country, and photo-engraving has already become a most grievous competitor to wood-engraving; indeed, I know some very skilful wood-engravers who have given up their art for want of commissions, and have become photo-engravers. Of the many establishments in which photo-engraving has found its home, there are in the first rank to be mentioned the Autotype Company of Munich, the oldest photo-engraving business in Germany, being under the direction of G. Meisenbach and R. von Schmaedel; then the renowned



STERNBURG'S PHOTOTYPGRAPHIC PROCESS.

firm of C. Angerer and Goeschl of Vienna, and the establishment of Heinrich Riffarth, 13, Bendlerstrasse, Berlin, the possessor of which—a scholar of Messrs. Angerer and Goeschl—is a very assiduous and successful worker. In the Meisenbach process, the part which is especially sought to be protected by the patent is the production and the use of the lined transparent glass screen, which has for its purpose to break up the half-tones of the photographic image. This is effected in about the following manner:—A white screen of large dimensions, provided with a series of parallel lines, is photographed, and hereby as much reduced that on the resulting negative the lines are very close together. A negative is now made of the object, the lined negative being placed between the object and the negative, at first so that the parallel lines are in a vertical direction to the axis of the lens; then it is shifted once during exposure, so that the lines

are now in a horizontal direction to the former ones. By this way an intersection of lines is obtained, and the photographic half-tones are broken up. The negative thus obtained is transferred in the usual manner to a zinc plate, and subsequently etched by acid to form a block in relief. This process, which has lately been very much improved, gives phototypographic prints of delightful softness in the half-tints, and of great sharpness. The process of Messrs. Angerer and Goeschl is a somewhat different one. Here, as far as we know, the transparent lined or granular plate is inside the dark slide placed directly before the sensitive plate, so that a grained negative is obtained by the first exposure. Formerly two lined plates, being ruled in contrary directions, were used to break up the half-tones; one of them was interposed between the lens and the sensitive plate, and, after about half the exposure having been given, was replaced



by the other one, on which the lines were in the contrary direction; then the remainder of the exposure was given. But it has been found that one of these plates, provided with closely and regularly-spaced cross-lines, is quite sufficient. If such a plate is obtained by the aid of photography—i.e., if the plate is a photographic negative taken from a larger cross-lined screen—it is important that the transparent lines on it, representing the black lines of the reproduced screen, are narrower than the opaque lines forming the intermediate spaces. The lined plate should have at most six black lines to a millimetre, otherwise it would be very difficult to transfer

illuminant, in order to get only parallel rays passing through the glass plates. In the spacious establishment of Messrs. Angerer and Goeschl, who employ more than 150 workmen, special attention is also given to the production of plates for photochromotypography. By this beautiful process oil or water-colour paintings are reproduced in true imitations, by printing the finished plates in colour in the letter-press. Positives are at first prepared for the actual colours, blue, yellow, &c., then by making reiterated copies negatives are obtained which they afterwards transfer to zinc, to etch them in the usual manner. The results obtained by this process are really excellent, and prove conclusively the practical use that may be made of Messrs. Angerer and Goeschl's plates. The photographic art printing house of Heinrich Riffarth, of Berlin, joins itself worthy to the above named establishments. Blocks for surface printing from line and grained-paper drawings, steel and copper plates, letter-press blocks in half-tone direct from photographs from nature, intaglio engraving in line, and half-tone on copper and zinc—all this work is done here, and the results belong to the finest which it is possible to obtain. I have been favoured by Riffarth with a photo-block, and your readers will be enabled by it to judge for themselves as to the results. It is a reproduction of a painting by H. Ebel, of Dusseldorf, which was exhibited at the last Jubilee Art Exhibition at Berlin. The prices for photo-engraving generally are 7d. to 9d. the square centimetre in the case of blocks from line-drawings, and 15d. to 18d. for blocks in half-tint. There is still to be mentioned another photo-engraving process, perfected by Dr. C. Stürenburg, of Munich, and called by him photogalvanography. It is based on the well known Pletsch process, a film of bichromated gelatine being exposed under a half-tone negative, then washed in cold water, coated with copal varnish, and then in a weak solution of tannin, after which an electrotype block is made from the relief. This process requires more time than the usual method of etching, but, on the other hand, extremely fine and clean printing plates are obtained, in which all the fine details of the gelatine relief are preserved. Through the kindness of Dr. Stürenburg, who intends to sell his inventions, I am enabled to have printed a specimen of the process; it represents Hôtel Achselmannstein at Reichenhall, Bavaria, and is a reproduction of a photograph of the same size.

#### KERAUNOGRAPHY.

BY HENRY E. DAVIS.\*

Dr. BOUDIN, in his "Histoire Physique et Médicale de la Foudre," has further pursued the study, and gives several observations which tend to confirm the now generally accepted views of the action of the lightning flash. He states that the rarity of the injuries by lightning has been the chief cause of the want of attention given to the matter, and it was only a great storm in Paris about 1854, when several deaths and injuries from lightning took place, that induced him to combine in one treatise the general information and result of studies on the subject. This pamphlet is replete with instances illustrating all its phases. He mentions having had the opportunity of seeing the corpse of a man who, having been killed and unclothed by lightning, remained erect, with an impression on his breast of the tree under which he was stuck. His subsequent researches demonstrate that death erect with the garments torn off and the impression of what he calls "photographic" images, are phenomena which frequently accompany fulmination, and gives several instances confirming his view.

Referring to printed images, the result of lightning stroke, he gives several instances. (1). In one, a lady sitting near an open window, on the ledge of which was a flower, which, being in the course of the electric current, was clearly imprinted on her leg, and although she received no other harm this image remained till her death. (2). The lightning struck a ship lying at anchor at Zante, killing a sleeping sailor; on examination was found on

\* Continued from page 92.



STÜRENBURG'S PHOTOTYPGRAPHIC PROCESS.

the image to the zinc plate and to etch it, and also in printing the finished block many difficulties would be met with. It is, therefore, better to use a cross-lined negative with only four or five lines to a millimetre. This may be placed before the sensitive plate at a distance of one-and-a-half to two millimetres. If the distance is greater, harder negatives are obtained; if it is smaller, the resulting negatives are softer. I may mention here, that in these establishments in printing the finished negatives on transfer paper or directly on the zinc plate, electric light is used with preference as an



his breast an exact imprint of the No. 44, which was fixed in metal on the vessel. (3). An almost similar case he records, only the impression was of a horseshoe nailed to the mizen of the vessel on which it happened.

Dr. Rindin concludes his observations on this portion of his subject with the following remark:—"The collection of facts which we have just considered proves that the phenomenon in question has an entirely different signification than that attributed to it by Franklin and others, i.e., that it arose from great sanguinary suffusion, and I think that it is, perhaps, of the photographic order."

There is a peculiar circumstance mentioned in this book which brings these effects into nearer relation with photography, although our author has not noticed it in that special connexion. He quotes two cases where bulls, of a red and white colour in patches, struck by lightning, had the white patches burnt and the red patches uninjured. Compare this with the actinic values of the two tints, there seems some similar sensitiveness to, or discrimination in colour, as that which we distinguish in photographic practice.

It has been noticed that the prints are produced as well on inanimate as on living objects. In a great storm in Cuba a palm-tree struck by lightning was noticed to have impressed on the withered branch the picture of a group of fir-trees which were at about 340 yards distance. It thus appears that if the course of the electrical fluid traverse any body it may mark the impression of the object it last struck on such body; nor need we be surprised at this occurring with a very considerable interval of space between the two objects, when we consider the enormous velocity of the force, about 240,000 miles a second. In other words, if the current were passed through a man six feet high in sufficient force to kill him, it would do so in  $\frac{1}{100000}$  of a second. It has been proposed to use this arrangement as a merciful manner of executing criminals.

There are numerous recorded interesting and valuable incidents of lightning printing, but those cases which I have already referred to are sufficient to illustrate the subject. Now to examine effects observed on the bodies of victims of the flash. The more recent discussions and the high type of investigation which our present students give us, have not yet accounted satisfactorily for the production of these prints on the human body. It has been long the opinion of many men of high scientific standing that the capillary vessels become suffused with blood forced into them by the electrical discharge, and that a certain modification of the fluid fixes the image. The bodies of persons killed by lightning have been found with branchiate markings similar to very minute blood vessels, and where persons have simply been stunned by the stroke, such marks apparent on the body have disappeared with returning consciousness. When we recognise that, with all the existing practical experience already gained, with all the study of many illustrious and energetic men, and with all the incentive which commercial success in investigations nowadays offers, we are yet without any acknowledged conclusions as to the formation of the latent image and occasionally also colour of certain objects on a sensitised surface, we cannot be surprised to find that there is much yet to be explained in the production of such images by electric force.

Mr., now the Right Hon., Sir W. R. Grove, F.R.S., was one of the earliest, after Professor Berres, of Vienna, to demonstrate the probable utility of electricity in the photographic workshop. So long ago as 1841 he presented to the London Electrical Society "A Voltaic Process for Etching Daguerreotype Plates." In this paper he clearly explains the reasoning by which he arrived at his process, giving fully his modification both of battery and materials. He says:—

"Admitting the usual explanation of the Daguerreotype, which supposes the light parts to be mercury and the dark silver, the object was to procure a solution which would attack one of these, and leave the other untouched. If one could be found to attack the silver and not the mercury, so much the better, as this would give a positive engraving, or one with lights and shadows, as in nature, while the converse would give a negative one."

He describes his attempts with various substances, and finally fixed on hydrochloric acid as the most suitable to his purpose. The etching takes about thirty seconds for an effective image, and when carefully cleaned, washed, and dried, the process is complete, and there is then a perfect etching of the original design in a positive form, which has this advantage over the original Daguerreotype, that impressions from it are not inverted

as in the original. This process offers means of multiplying the Daguerreotype by electrolysis. An ordinary Daguerreotype gives a faint electrolytic impression, but is destroyed in doing so, and this impression cannot be perpetuated; but one etched in accordance with the above method will admit of repeated copies being taken from it. The paper referring to this process is republished in the sixth edition of the "Correlation of the Physical Forces." In January, 1857, the same author contributed to the *Philosophical Magazine* a paper entitled "New Methods of Producing and Fixing Electrical Figures." One series of experiments contained therein are of great photographic interest; they were conducted in this manner. Two plates of glass, about lantern-slide size, were very carefully cleaned; the word "Volta," in thin paper letters, was cut out and placed between them; pieces of tin foil, somewhat smaller than the glass plates, were placed outside each, and these coatings were connected with the secondary terminals of a Ruhmkorff coil. They were then electrified for a short time, and the interior surface of one of the glasses submitted to the fumes of hydrofluoric acid. The previously invisible letters came out clearly, and a sharp permanent etching of the word "Volta" was produced on the surface of the glass.

This experiment was repeated up to the point when the plate had been electrified. It was then coated by candlelight with iodised collodion, and sensitised on a forty-grain nitrate of silver bath, exposed to the light through the glass for a few seconds, and developed with pyrogallie acid. The word Volta and the margin of the plate beyond the tinfoil were darkened, whereas that part which was originally covered by the tinfoil seems to have been projected by electrification from the action, or such effect was produced on that portion of the glass as gave it, notwithstanding its equal apparent clearness, some power of modifying or restraining the action of the light.

I had the privilege yesterday, at the kind invitation of Sir William R. Grove, of examining these results, which he has very carefully preserved since he read his paper, and they are quite perfect to this day, and fully confirm the results stated.

It seems strange that no further investigations on these lines have been made by our photographic scientists, as there seems in these experiments to be the germ of valuable processes. The paper referred to is also published in the sixth edition of the *Correlation of the Physical Forces*.

I have now traced electric force in its natural printing process from the earliest times till we have reached the point where its use seems to be capable of comparison in some phases of its action with photographic results, and to be apparently a correlative force in certain circumstances. Its more recent uses, especially in process work, are well known to you all, and I hope that the present discussion will furnish us with more interesting matter than I have been capable of placing before you.

## LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTION.

BY CHAPMAN JONES.

### CHAPTER XIX.—THE REDUCTION OF NEGATIVES—INTENSIFICATION BY MEANS OF MERCURIC CHLORIDE AND THE FERRICYANIDES OF URANIUM AND LEAD—SOLARIZATION.

THE reduction of negatives by means of a mixture of hypo. with ferricyanide of potassium is conveniently done by soaking the plate first in water, then in hypo. solution of 2 oz. to the pint, and gradually mixing this hypo. with a solution of the ferricyanide made by shaking a few of the washed crystals in a little water.

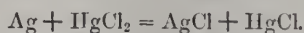
It is necessary to bear in mind that it requires considerable care to reduce a negative without making it useless, and that it is possible to effect different results by reduction. The developed image is first formed upon the surface of the gelatine, and the image penetrates the film in proportion as it grows in density. A quick-acting reducer, therefore, that dissolves the image as soon as it comes into contact with it, will clear away the image from the surface of the film gradually downwards. This method of reduction is useful in removing fog due to over-development; but its tendency is to produce hardness, and, in the absence of fog, it dissolves away the detail in the



shadows. By using so weak a reducing solution that it practically penetrates the film before it appreciably acts, an approximation to a proportional reduction of the negative may be secured. It is very doubtful whether either of these results can be perfectly produced; but it is certainly possible to get very different effects according to the nature of the precautions observed. If a negative is very dense in the lights and thin in the shadows, it is hopeless to reduce it.

To the beginner, it is a golden rule never to reduce negatives except as practice in the use of reducing solutions. Intensification, on the contrary, is easy and certain, as easy as fixing and washing. If a reducer acts thoroughly and through the film, the whole image disappears; but an intensifier that acts thoroughly and through the film gives simply what is wanted—viz., a proportional increase of density throughout the negative. The matter which needs regard is, that the method used shall not give too great an effect, for an intensifier must be used thoroughly, or, as in reducing, the nature of the negative will probably be changed.

Though there are many methods of intensification, there are very few that deserve unqualified recommendation. It is possible to intensify by adding silver to the silver that constitutes the image after the manner of the intensification, or re-development, of collodion negatives; but as nitrate of silver readily stains gelatine, this method is not certain, and, therefore, not advisable. The action of corrosive sublimate (that is, mercuric chloride,  $\text{HgCl}_2$ ) upon the silver image is useful in this connection, and is the first step in several methods of intensification. The mercury salt gives half its chlorine to the silver, and each atom of silver is replaced by two molecules—one of chloride of silver, and one of mercurous chloride—



The two compounds produced are white, therefore the image is bleached. The great increase in the bulk of the matter composing the image gives a very large and obvious increase in its density, but it is more transparent than the original silver image, because of its whiteness. The simple application of the mercury solution is sometimes used for reduction, but it is not an advisable method, as the bleached image contains chloride of silver, and is therefore liable to be darkened by exposure to light. The solution of corrosive sublimate for this purpose may be conveniently as strong as possible, and it should be slightly acidulated with hydrochloric acid to prevent staining of the gelatine.

There are many ways of giving a greater opacity to the compound image produced by the mercury solution, by changing its colour, though in most cases the actual bulk of material composing the image is reduced. The usual method, is to use dilute ammonia, which dissolves away the silver chloride and changes the mercurous chloride chiefly into the black compound,  $\text{NH}_2\text{Hg}_2\text{Cl}$ . The intensification produced in this way is often too great, and the complex character of the substance of the image remaining is an additional drawback to the process. Negatives so intensified appear to be fairly stable; but the ammonio-mercury compound is not so reliable as the image resulting by other methods. When ammonia is used, the washing at every stage must be thorough to secure permanence and freedom from stains.

For ordinary use, a ten per cent. solution of sulphite of soda, made just acid with hydrochloric or citric acid, has many advantages over other reagents that have been proposed to follow the mercuric chloride. The chemical reaction is simple; the silver chloride is dissolved, and the mercurous chloride is reduced to metallic mercury. The remaining image is easily acted on, if necessary, for reduction or further intensification. The amount of intensification produced by this method is sufficient, except in cases of considerable misjudgement, but it is not so great as to cause apprehension. There is no staining, and if the mercuric chloride is not washed away before the sulphite

of soda is added, the chief result will be nothing worse than a retardation of the action of the sulphite.

The silver image (and also the mercury image produced as above described) has the property of reducing certain ferricyanides to ferrocyanides. By selecting a metal whose ferricyanide is soluble, and whose ferrocyanide is insoluble, and applying the solution of its ferricyanide to the silver image, a reaction takes place, which is, doubtless, analogous to the reaction with mercuric chloride, for which the equation is given above; but the ferrocyanides, instead of the chlorides, of the two metals result. Uranium ferricyanide gives the chocolate-coloured uranium ferrocyanide, which is so opaque to photographically useful light that this method should only be resorted to in extreme cases. Lead ferricyanide gives lead ferrocyanide, which is white, but which, after a thorough washing, can be blackened by ammonium sulphide, or changed into chrome yellow by chromate of potash. The silver remains in the image, and this gives its black sulphide in the first case, and its red chromate in the second. This method of intensifying with lead gives so much opacity in the image that it is only of use in certain photo-mechanical processes, where what is called "absolute opacity" is a desideratum.

In applying these methods it is advisable to produce the ferricyanide only as it is required. The precautions that it is well to observe when intensifying with uranium will also illustrate the procedure when using the lead compound. The negative to be treated may or may not have been already intensified with mercuric chloride and sodium sulphite, but it must be scrupulously freed from every trace of hypo. or of the sulphite, as either of these compounds would act upon the intensifier, and produce a deposit of the red salt, even more rapidly than the image itself. The amount of washing usually applied after fixing or intensification ought to be sufficient, but if it proves otherwise, the negative should be soaked for five or ten minutes in water containing a few drops of a solution of peroxide of hydrogen to each ounce, and then washed. If the negative is not to be subjected to this treatment, it is soaked in water till thoroughly wet, and then placed in a solution of nitrate or uranium containing four or five grains to the ounce while the solution of the ferricyanide of potassium is being prepared. This last salt should be kept in the solid condition, and not be previously mixed with the uranium salt if staining or fogging of the negative is to be avoided. While the plate is soaking as described, one or two pieces of the ferricyanide of potassium, say about the size of a pea, are put into a small glass and washed by pouring water over them until they are perfectly clean and of a bright ruby red colour. They are then shaken with a little water until it acquires a good yellow colour, and half a dram or so of the solution put into a glass. The uranium solution from the plate is added, the mixture is re-applied, and its effect is carefully watched. As the yellow colour of the solution fades away, the strength of the intensifier declines, and more ferricyanide of potassium must be added. If the water used is hard—that is, if it contains carbonate of lime—a few drops of strong citric acid may, with advantage, be added to the solution.

When intensification by means of lead is resorted to, the operations are similar to those just described.

Lead nitrate	...	...	20 grains
Ferricyanide of potassium	...	...	30 "
Water	...	...	1 ounce

to be filtered before use, is a useful formula. The effect of the solution is to change the silver image into the ferrocyanides of lead and silver, and, therefore, to whiten it. (It is possible that the ferricyanide of silver is formed.) When the bleaching is complete, a very thorough washing is necessary, for the least trace of the excess of soluble lead salt that remains in the film will cause a very appreciable fog. The plate is then soaked in a dilute solution of either ammonium sulphide or of chromate of potassium, to



get a black or yellow image as described above. In pursuing this method of intensification the operator must expect each step of the process to be tedious, and allow ample time, especially for the washing after the application of the lead and ferricyanide.

The reversal of the photographic image by reason of over-exposure is a phenomenon that is not duly appreciated by negative makers in general. Janssen found, in photographing the sun, that from one to two hundred thousand times the most convenient exposure gave a positive instead of a negative on development, and that if the exposure was increased to one million times, a second reversal took place, and a negative was produced. But with a very much less excess of exposure the effect of reversal begins to show itself injuriously, and this especially with gelatine plates. Bennett showed that with his plates double the exposure that gave full density caused a very marked diminution of density, and that ten times the exposure was equivalent on development to no exposure at all. The brightest parts of the high lights are the first to begin to reverse—that is, they are thinner in the negative than they ought to be; and this gives flatness or hardness where there ought to be brilliancy and transparency—a fault that some operators are inclined to consider as inherent in the photographic process. We know that exposure and development are in a degree reciprocal, hence reversal is largely a matter of development. A powerful developer will give flatness in the lights when a weak developer would have given a perfect gradation that would not have been lost on strengthening the developer to get the dark detail.

Practical use of the reversal of the image by prolonged exposure was made long since in getting a negative directly from a negative; but, probably, the best method of applying this principle is according to the following process, devised by T. Bolas:—A gelatino-bromide plate is soaked for a few minutes in a four per cent. solution of potassium dichromate, rinsed with fifty per cent. alcohol, dried, and exposed under the negative to be reproduced for from two to five minutes in sunshine, or from ten to fifteen minutes in good diffused daylight. The plate is then washed in cold water, and developed with an alkaline pyrogalllic acid developer. The action of the chromate is probably twofold: it hardens the gelatine, and so retards development in proportion as the light has gained access to the plate, and as reversal will not take place except in the presence of either the oxygen of the air or available oxygen from some other source, it may be that the chromate, which is a very powerful oxidizer, assists directly in the solarization.

(To be continued.)

## ON DON'T.

BY R. GODFREY.\*

Don't find fault with your chemicals if you do not succeed in your early attempts. It is too common a trait of human nature to shift the blame from one's own shoulders to some one else.

Don't buy your chemicals retail—get a set of stoppered bottles, and keep a supply of each solution by you; neither wander about amongst the multitudinous formula which are offered to the public.

Under-exposure is bad; it is much easier to rectify an over-exposure.

Don't try and take two pictures on one plate, as some people have done, in the hope of producing a new effect in dissolving views. Mark your slides.

Remember, to be in a hurry to immortalize your friends is a mistake; also there is no surer way of offending a friend than by producing a bad likeness of him. Don't take work out of the professional hands.

When on an excursion, don't try to bring home a complete panorama of all you have seen, or expose at everything you see:

\*Abstract of paper read before the Birmingham Photographic Society.

use a modicum of brains on each plate. "Quality is better than quantity."

Take care of your lens cap when on an excursion. It is far better to carry a shutter.

Keep your chemicals out of the way of "Meddlesome Mattie," and label everything in the way of chemicals, writ large.

Never wrap up your developed negatives in newspapers, or else you may produce cheap advertisements of Ellman's Embrication, or Beecham's Pills, as one member of the Society can testify.

Don't be afraid of your failures or to ask questions of the members of the B.P.S.; every failure should be a step towards success. I have always found the old hands ever ready to assist a new "chum" to amend his ways. When developing, have patience; do not hurry if you want to succeed.

Don't go out without overhauling your kit; a screw missing may cause you annoyance. Never forget to draw the slide before you remove the cap off the lens; that has happened to more than one of my acquaintances.

I once drove six miles to take a special object, to produce the photo in a court of law, and having, as I thought, exposed the plate, went home, and, developing, found a glorious blank. I had omitted to draw the slide, owing to a friend keeping me in conversation at the time. Moral: Don't talk to folks while exposing.

Don't force your plates in drying by putting them on the window ledge in face of a hot sun; I once did that with a portrait negative, and of all the horrid caricatures, that was the worst; the chin was endeavouring to kiss the nose, and the forehead coming down to see what was going on. Always attend to the washing and cleaning of your dishes, glasses, &c., yourself; dirty dishes, &c., mean failure. Always mark your plate at back with a bit of stamp paper; at back when you are projecting the use of the changing bag on a tonr.

Don't imagine photography is simply a mechanical art. A certain celebrated painter told a fop, he "mixed his colours with brains." So photographers must mix brains with their chemicals, and give a liberal supply into the bargain.

To attempt to buy the art in a shilling manual is a great error. Whenever you are tempted to take a house or a pretty bit of scenery with a country maiden as a centre piece, always promise a copy, and mind you send it: such promises are too often forgotten.

Don't imagine that the possession of a camera and a square of black velvet is the "open sesame" into anyone's picturesque grounds to take a shot, but always remember that a little civility in such cases goes a long way, and, as a Quaker lady once said to me, "When civility won't do, a shilling will." And a shilling judiciously placed will often secure the privilege of taking some lovely bits in private grounds or cottages.

Never omit to provide yourself with a portfolio, no matter how homely, in which to keep prints of all you take. Such a collection, properly dated in chronological order, will be a valuable record of progress interspersed with failures. Never mind—keep them all, and from them rise to better things. Don't be satisfied with a low level of mediocrity in your work. It is a glorious art, worth careful culture.

## Notes.

"The History of Photography," by W. J. Harrison, about to be published by Percy Lund and Co., of Bradford, will, doubtless, be a very desirable book for the photographer and the student of photography to possess. Indeed, one who has read Harrison's articles on this subject, and kindred subjects, can have no real doubt as to the value of the promised work.

There is to be a special subscription edition at 7s. 6d., illustrated with some dozen portraits, but copies of this must, we understand, be ordered in advance.

The following is an abstract of the contents of the work:—"Introduction—The Origin of Photography—Some Pioneers of Photography: Wedgwood and Niepce



—The Daguerreotype Process—Fox-Talbot and the Calotype Process—Scott-Archer and the Collodion Process—Collodion Dry Plates, with the Bath—Collodion Emulsion—Gelatine Emulsion with Bromide of Silver—Introduction of Gelatino-Bromide Emulsion as an article of Commerce by Burgess and by Kennett—Gelatine Displaces Collodion—History of Photographic Printing Processes—History of Photographic Printing Processes (continued)—History of Roller Slides; and of Negative Making on Paper and on Films—History of Photography in Colours—History of the Introduction of Developers—Summing up—Dr. Madlox on the Discovery of the Gelatino-Bromide Process.”

Though photography has made its way well-nigh everywhere, it is not as yet officially recognised in the Royal Courts of Justice. A judge has never ventured, so far as we know, to bring in an instantaneous camera with him and keep it before him on the bench, though it is quite certain that such an apparatus could be turned to good account sometimes. Say, for instance, a witness is giving evidence in a way which is clearly most unsatisfactory. Why should not the judge secure a negative of him at a moment when he is making some evidently false or prevaricating statement? Surely such a photograph inserted in its proper place in the judge's notes might prove of subsequent use, especially if a new trial were asked for! The judges who had not previously heard the evidence would surely be much better able to appreciate its importance if they could be shown the faces of the witnesses by whom that evidence was given, and their faces, moreover, as they appeared at the moment they were giving it. In cases where evidence had been taken on commission, we think the cause of justice would be materially assisted if a photographic study or two of each witness's face were appended to every deposition. So, too, in trials in which affidavits are filed, we would insist on a photograph of the party making each affidavit (taken at the moment he was swearing to its truth) being attached. Other uses to which photography might be turned in legal matters could be soon suggested; but the first thing to do is to get the camera officially recognised in the Law Courts, and negative evidence admitted by the judges. The development of the notion is certain to quickly follow.

“Whistling ladies” are said to be the latest fashionable sensation in New York. But though there is a regular mania for this eccentric form of social amusement in the Empress city—several of the most successful “sifileuses” have even been photographed “in the act” of whistling, we read—no effort has been made either in Paris or London drawing-rooms to follow the Yankee lead. Doubtless the whistling epidemic will come, however, ultimately, just as spelling bees, and roller-skates, and soap-bubble blowing parties came in past seasons. Meanwhile, though, fashionable London would be likely to find much more amusement by noting the latest novelty in the way of social entertaining in the French capital. And we urge this with all the more emphasis, seeing that the said

novelty is a photographic one, and one which, if developed to any considerable extent, could not but be good portraits. But let us describe in what the novelty consists.

The other night, then, be it known, the Comtesse de Beaurepaire, one of the leaders of fashion in Paris, gave a *soiree* on a very gorgeous scale, and many of the principal operatic singers and actors of the day took part in the amusement of the guests. But about 11 p.m., just after Coquelin the younger had given one of his father's clever monologues, the company were surprised to notice the sudden darkness of the large saloon, and to hear that a certain M. Delton was about to display a series of photographic slides on the prepared screen that was now observed at one end of the apartment. On this a hidden orchestra played an overture, and then came the first slide, a most realistic photograph of one of the best known of the equipages that frequent the Bois de Boulogne—the four-in-hand which is driven by General de Gallifet. Then followed the Prince de Sagan in his “natty” victoria; Messonier the painter, on his hack; Mrs. Mackay, in her barouche; General Boulanger on his splendid coal black steed; and so on—each change of picture being accompanied by an appropriate change of the music, General Boulanger being heralded, of course, by the inevitable “*En revenant de la revue!*” The great attraction of the show is said to have consisted in the fact that most of the celebrities who had been photographed in carriages for the occasion were actually among the guests. At all events, M. Delton's *projections photographiques* were voted a great success, and it is said that he is being engaged on all sides, it being understood that he is constantly engaged in adding fresh examples to his studies of social life in Paris. In time he hopes to have realistic photographs to suit every taste, and of course he will have—in fact, already has—imitators.

Now London society will, doubtless, be equally anxious to “see itself as others see it,” and we need not stay to point out now what an agreeable relief to the ordinary musical “at home,” or humdrum reception, an exhibition in a good oxyhydrogen lantern of a series of photographs taken in Rotten Row and the drive would be. What an interesting set, again, might be made out of an hour with the *debutantes* at the first drawing room of the season, or of a Parliamentary lobby series; or especially at the present moment of a Tattersall's set. Such a show would be, indeed, a most welcome change from the amateur reciter, who ought to have had his day by this time; and if only a fashionable lady or two would commission a competent photographer to prepare photographs for a specimen entertainment, we have little doubt but that the innovation would be quickly appreciated and developed.

Professor Graham Bell is said to be an expert photographer, and, according to the *Chicago Evening Lantern*, has been amusing himself lately by doing a little amateur detective work in his own house with the assistance of a camera. Suspecting one of the housemaids to have stolen



several articles of jewellery missed by his wife, he, with Mrs. Bell, concealed himself in a dressing room at the time when the girl came into the bedroom to do the usual morning work. The servant, after examining various articles, went to a dressing-case and took from it a small gold chain. While she was holding it up, the professor, who had his camera in readiness, photographed her through the opening in the curtains which hung in the doorway between the two rooms, and thus secured indisputable proof of her dishonesty. It is satisfactory to know that the girl, confessing she was the perpetrator of the thefts, was not prosecuted. Probably Professor Bell considered the curious photograph he had obtained was sufficient compensation for the loss of the jewellery. The *Lamp* says the professor has a most interesting collection of snap-shot photographs of domestic incidents taken without the knowledge of the actors. No doubt the collection is interesting enough, but it makes one uncomfortable to think of a man armed with a camera, stealing about the house and taking photographs in this way.

For instance, supposing your eldest son has a mania in this direction, and uses his camera with more zeal than discretion. How horrible, at the end of the week, to be confronted with a series of photographs illustrating your peccadillos—the expression on your face when you uttered the naughty word on finding the chops had been fried instead of broiled; your attitude of despair when your morning omnibus is approaching and the girl has forgotten to clean your boots; or the altercation with the income tax collector! It would be easy to multiply the awkward moments which could be perpetuated when you would much rather forget them as soon as possible; but we have said enough to indicate a possible danger in a too ardent practice of domestic photography.

The portrait club canvasser is a person who, as a rule, literally lives on his friends. This life is usually a short and not always a merry one. Very recently we had the opportunity of having five minutes' conversation with an applicant for a situation who, in referring to his previous occupation, said he had acted as canvasser for a well known firm of photographers. "And how did you find it answer?" was the natural question. "Very well indeed," said he, "for a time. I took eighty orders in two months, and as they were all for the thirty shillings club portraits, the commission brought me in a very good living." "But if this kind of thing paid you, why did you give it up?" "Well, sir, after I had exhausted everybody I knew, what could I do? When I started I had a very good connection in the City, and knowing so many people I was able to persuade them; besides, many had their portraits taken just to help me. But when I came to the end of the list, I found portrait canvassing was very poor work. You must be continually making new friends in order to keep the thing going. That's my experience, and it's the experience of a good many others. In fact, you may take it when you've had a go at everybody you know, and at everybody you can get an introduction to, it's time to turn the canvassing business up." There seems to be some truth in this.

Gaston Tissandier, in last week's *La Nature*, draws attention to an old grievance of the tourist photographer—the heedless opening of boxes of sensitive plates by officers of the Customs. M. Tissandier gives two instances, one of a particularly aggravating character. In this case, the traveller had obtained over a hundred negatives of scenes in Australia, and transmitted them to Paris, there to be developed. He packed them with the utmost care, and had them labelled with instructions that they were not to be opened in the light. Notwithstanding, when they arrived at the photographer's establishment in Paris, all the packets had been opened by the ruthless hand of the Custom House officer. M. Tissandier concludes his complaints by emitting a wish which, as he truly says, will find an echo from all tourist photographers. The officers, he says, are fulfilling their duty in examining and opening trunks, but when they come to packets of sensitive plates, why should not the examination be conducted in a dark-room with the little ruby lantern of the photographer? The suggestion is one which has appeared already in these columns, but it is none the less welcome. To be effectual, however, the Custom House should know something of photography. To the non-photographic mind, the importance of the ruby light is likely not to be considered imperative, and the ignorant person is quite capable of opening the door of the dark-room a little way so as to see the better, and to believe that in so doing he is not harming the plates—very much.

Much annoyance was caused at the *Graphic* office during the Soudan war by a batch of plates supposed to be valuable negatives of exciting scenes, which, upon an attempt to develop them, turned out to be utterly ruined. During the journey from Africa, the box had been opened by some officers and ignorant functionary.

The brothers Henry are proceeding to further triumphs. A photograph of the Pleiades was exhibited at the last meeting of the Astronomical Society of France, showing several new nebulous patches. One of the largest stars was quite covered with nebulous matter which had not been detected hitherto. A singular peculiarity of the photograph consisted in a series of thin streaks of nebulous matter extending in some cases from star to star to a considerable length. The exposure was four hours.

The authorities of St. Paul's Cathedral are so extremely careful of their new reredos that they will not allow the public to approach sufficiently near to examine its details. It can be looked at from the west-end of the choir or from the south side of the sanctuary, but nearer you must not go. Those who want to see the design in all its somewhat elaborate ramifications must look at the very excellent photographs which have been taken. But doesn't it savour of burlesque, that after trying ineffectually to see the reredos in its place in the Cathedral, one must journey, say to Spooner's, in the Strand, in order to be gratified? It would save a good deal of trouble if the Dean and Chapter ordered a photograph to be hung up in the Cathedral itself.



The photograph of Prince William, the eldest son of the Crown Prince, which is exhibited in some of the London shop windows, has become the subject of much curiosity since the graphic description of the Prince by Mrs. Crawford, the Paris correspondent of the *Daily News*, appeared. One of the Prince's arms is nearly dead. It is malformed in a peculiar way, being finished off with a ball of flesh, from which sprout five smaller balls with round nails upon them. Prince William, says Mrs. Crawford, keeps his abortive hand in a pouch in his coat when he is in mufti, or into his uniform when he is habited as an officer. In the photograph, which represents him standing with his wife and son, the left hand is half concealed by the boy's cap, and there is nothing to show the deformity. The anxiety of the spectators to make out the shape of the hand is quite typical of the interest which anything concerning royalty—no matter how insignificant—creates.

It is time all the members of the House of Commons were photographed, and copies given to the police. The arrest of Mr. P. O'Brien, no doubt, was unintentional, but it has put the Government in a predicament, and predicaments are distinctly things to be avoided. So far as the Opposition is concerned it is impossible to say who will next be an object of interest to the police; therefore, to prevent mistakes, if it is beyond the powers of Parliament to compel every member to be photographed, the members themselves should take the matter into their own hands, and send their portraits to Scotland Yard.

The skeleton—said to be that of Thomas à Becket—recently discovered at Canterbury Cathedral has been photographed by John Bateman, of Canterbury, and the result should interest many.

### FINISHING PHOTOGRAPHS.

BY EDWARD DUNMORE.\*

HAVING been requested to furnish a short paper for this evening, in harmony with our annual show of work and the text suggested, "Finishing Photographs," I will endeavour in a few words to bring under your notice the different processes that a photograph has to undergo after it has surmounted the troubles of its chemical birth, and is, so to say, fairly launched to either founder in the waters of oblivion, or remain a pleasure and a joy as long as its chemical constitution will permit.

We will take up the photograph after its final washing, and the first operation it has to undergo is drying and flattening out; the trouble of doing this is somewhat dependent on the paper itself. Highly albumenised paper gives an increase of trouble in proportion to its gloss. If dried between sheets of blotting paper under pressure, or on shallow frames covered with calico, it is presented in a fairly flat condition, but if hung up to dry in a current of air, there is a good deal of objectionable curliness that requires ironing out face down on a piece of stout, fine felt, with an ordinary flat-iron, or it may be laid face down on a slab of glass, and firmly scraped on the back with some smooth instrument such as a bone paper-knife, or, as some prefer, rolling them face outward on a smooth round rod and leaving them so for an hour or two. By using any of these plans the tendency to curl is much lessened.

Then comes the trimming. Three distinctly different ways are in vogue, namely, with the scissors, the knife, or the wheel cutter. It must be assumed that the prints have been in some way marked to facilitate this operation by having an opaque line

drawn round them, or the margin painted out, a necessary condition if an opaque cutting shape is used; if a glass one is in favour, the lines, although useful, are not so imperative. A glass table, or something equivalent, is required to support the prints during cutting by knife or wheel. Glass, on the whole, is perhaps more in favour than anything else. Complaints may be made that the knife requires frequent sharpening, but this is soon done, and unless a good deal of unnecessary pressure is used is not a very valid objection. The clean, smooth edge obtained is its great recommendation. A piece of good hard, stout cardboard answers nicely when only a few prints have to be trimmed; a smooth, fine-grained wood has also its advocates. The wheel cutter is an excellent instrument, especially for cutting curved lines; it seldom, or never, requires sharpening, but the cut is not quite so clean as with a good knife. The shape of the knife has much to do with its effectiveness; a freshly broken penknife blade will cut excellently well, which indicates the knife should be sharp pointed. The shape or rule must have its edge perfectly flat, so that it will press firmly and equally along the print close to the cutter; if it does not, the probability is that the paper will be puckered up and torn as the knife is drawn along, however sharp it may be. A perfectly smooth, clean cut must be made, whatever means are used to effect it.

After trimming, the print is ready for mounting, or hot pressing, as the case may be. With hot pressing prints are intended for the album without mounting, which indicates that the touching up should be previously done, as the gloss imparted makes the retouching less noticeable, and there is no risk of crumpling the print.

The mounting is a very important process, both as regards the existence and beauty of the print. Only such mountants should be used that are known to be perfectly innocuous. Starch, gum-arabic, and glue, are the most popular substances. I believe glue or gelatine is preferred by professional mounters, and starch by those who work on a smaller scale; each has its recommendations. With glue, the print once laid down must there remain; no shifting about to adjust it can be done. With starch or gum this is easy, and starch is especially cleanly in use, having no gloss; if a little gets on the mount it is not noticeable. Mixtures of these substances have also met with favour, especially a compound of starch and gelatine, which is supposed to combine the advantages of both substances, and probably does. Whatever mountant is used, it is an imperative condition that it is free from acid, from fermentation, or otherwise a mucilage of gum arabic has been and is largely used, perhaps because it is so convenient, being used for numerous other purposes than mounting photographs, and is generally at hand; properly made it keeps well and retains its adhesiveness. Gum tragacanth and quince seeds both supply excellent mountants, but when the first named substance is so easily obtained it is scarcely worth while to seek others.

The mounts next must receive attention. There are two classes of them—one in which the prints are in optical contact with the glass, and the other not. It goes without saying that of whatever material the mounts are made they must be free from all deleterious matter. If cardboard is used, a lithographed tint undoubtedly in some measure protects the print from anything wrong in the boards, but, for my own part, I infinitely prefer India paper between the photograph and the mount, which, in my opinion, not only improves the appearance, but conduces to the permanence of the print.

The marginal tint, whether lithographed or India paper, has the effect of binding the composition together, as lines drawn round it will when light and dark parts of the subject end abruptly at the edges of the print. Some prefer a margin unbroken by lines, or tint, or ornamentation of any kind; this is, however, a pure matter of taste or artistic feeling. We are seldom wrong if we incline to simplicity. I think the highly ornamental borders we sometimes see are very objectionable and damaging to the effect of the photograph. In addition to the tint, an indentation round, called the plate-mark, is oftentimes an excellent finish, although it is open to the objection of being a sham, the plate-mark really being the result of printing an engraving, the pressure used to impress the image impressing also the edge of the plate. It does not, however, mislead anyone, is an innocent deception, and improves the work.

Mounting prints in optical contact with glass is a favourite way with many; it gives a richness and quality to a photograph that nothing else will, and tends to its preservation. The green shade sometimes seen is owing to unsuitable glass being used;

\* A Communication to the Photographic Club.



a pure white, or glass inclined to pinkiness, should be selected. If the glass is right, the colour of the mounted print leaves nothing to be desired. The mountant must be clear and free from dirt. About a quarter of an ounce of good gelatine is dissolved in half a pint of water; the exact quantity is not material. When it is quite dissolved and hot, in a sufficiently large dish immerse the print for a minute or so; slip under it the glass which has been cleaned and warmed, and lift both up carefully together, and with a squeegee go over the back of the print to expel all air-bubbles; sponge the face of the glass with a moist, warm sponge, and set aside to dry. If it has been properly done, it will present a perfectly unbroken surface, free from markings of any kind; it need not be said that grit or air-bubbles are fatal to good effect.

A very effective and popular method of mounting is the use of cut-out mounts, which has somewhat the effect of framing, and adds something to the weight and bulk of the picture. When shapes other than rectilinear are chosen for the subject, cut-out mounts are often the most artistic and effective method of doing it. Circular, oval, or dome shapes are better masked off on the negatives than trimmed to them afterwards, unless cut-out mounts are intended to be used, the margin being left white or tinted according to circumstances. Most photographs are touched after mounting, defects made good, and too bright spots reduced in intensity. After this, the application of an enamel cerate will not only brighten up but preserve the print. I have great faith in the preservative powers of the resinous or waxy matters applied to the finished work; in fact, any application that will, without injury to appearance or degradation of the lights, protect the picture from decay, is to be commended. In small work, such as cartes-de-visite and cabinets—portrait subjects especially, enamelling by giving them a coat of collodion and gelatine will not only improve their appearance, but wonderfully add to their atmosphere resisting capabilities. I have prints by me, taken from the usual batches and enamelled, that were made sixteen years ago, and have remained as bright and pure as when first done; also others mounted in the ordinary way with gum and starch, with a final rub of cerate, that have remained without change two or three and twenty years. Of course the polished surface of the enamel is out of place on large work, but with small it offers many advantages. The various ways of mounting on blocks, panels, &c., are varied, but require no particular notice.

The final operation of framing is now to be thought of, and much depends on individual fancy. A light frame is, perhaps (of whatever material it may be made), most suitable for a photograph with a margin, a dark picture framed close up will bear a heavier frame; but whatever frame is used, simplicity should be the governing idea. The glass should be carefully pasted to the frame with strips of paper, and the back well papered over, care being taken to remove any shreds or dust from between the picture and the glass that may have accidentally found their way to the front, and which forms a considerable eyesore and vexation when the framing has been completed; it is also most necessary to see that the picture is square in the frame, and that a proper amount of margin has been left around it. A little mistake in these matters is very annoying and damaging to the general effect. I think I have now touched on most of the different phases in the finishing of a photograph, from the time it leaves the washing tray until it either becomes a warning of something to be avoided in future, or a source of satisfaction and pleasure to the possessor and his friends, at the same time, suggestions of topics that may lead to profitable discussions.

## THE LITERATURE OF PHOTOGRAPHY.

BY W. JEROME HARRISON, F.G.S.\*

(24) DESIGN AND WORK and Mechanical World. The Journal of Scientific Industry. 4to. For all interested in applied science, new inventions, machinery, manufactures, &c. Small folio; 1876-81 ||| London.

(25) EDINBURGH (THE) JOURNAL OF SCIENCE. Conducted by David Brewster. 8vo.; 1824-32. (United in 1832 with the *Philosophical Magazine*.) Which see.

(25\*) EDINBURGH PHOTOGRAPHIC SOCIETY, TRANSACTIONS OF THE. Monthly (to members only). 1882-85+;

8vo., eight pp.; issued by the Hon. Sec., G. G. Mitchell, 2, Baxter Place, Edinburgh. The Society now numbers 450 members.

(26) EDINBURGH PHILOSOPHICAL JOURNAL. Exhibiting a view of the progress of discovery in natural philosophy, chemistry, natural history, practical mechanics, geography, statistics, and the arts. Conducted by David Brewster and Robert Jameson. 14 vols., 8vo.; Edinburgh, 1819-25.

Continued as

(26a) EDINBURGH (THE) NEW PHILOSOPHICAL JOURNAL. Conducted by Robert Jameson. 57 vols., 8vo.; 1826-54.

New series. By T. Anderson and others. 19 vols., 8vo. 1855-64, ||| Edinburgh. (United in 1864 with the *Quarterly Journal of Science*.) Which see.

(27) ENGLISH (THE) MECHANIC. A record of mechanical invention, scientific and industrial progress, applied chemistry, arts, manufactures, engineering, building, &c. Two vols., 4to, 1865-66; London.

Continued as

(27a) ENGLISH (THE) MECHANIC AND MIRROR OF SCIENCE AND ART. A record of engineering, building, inventions, manufactures, industrial progress, electricity, photography, chemistry, astronomy, &c. 13 vols. (iii.-xv.) 4to; 1866-72; London.

Continued as

(27b) ENGLISH MECHANIC AND WORLD OF SCIENCE. With which are incorporated "The Mechanic," "Scientific Opinion," and "The British and Foreign Mechanic." 4to, 1873-88+; twenty-four pp. and 8 pp. advt. Weekly, price twopence; London, 332, Strand.

Almost from the commencement, the *English Mechanic* became a medium of intercommunication for photographers, and a week rarely passes without the appearance of articles, queries, and answers relating to photographic subjects. The columns for "exchange of apparatus" and "sale or exchange" are also largely used by the fraternity.

(28) ILLUSTRATED (THE) PHOTOGRAPHER: Scientific and Art Journal. Weekly. 1868-69; 2 vols., 4to. E. Dring, 54, Paternoster Row, London, price 3d.; or in monthly parts, one shilling.

No. 1 bears date Feb. 7, 1868. It was incorporated in 1870 with "Photographic Opinion." Vol. i. contains 570 pp.; and vol. ii. 590 pp., ending Dec. 31st, 1869. ||

Edited first, we believe, by Mr. George Dawson, and then by Mr. A. H. Wall.

(29) ILLUSTRATED (THE) PHOTOGRAPHIC ALMANAC, and Manual for Beginners in Photography; or text-book for advanced students; and a complete guide for colourists, &c., &c. 1869. Edited by A. H. Wall; large 8vo.; price one shilling. Published at the office of the *Illustrated Photographer*, 54, Paternoster Row.

This volume contains 80 pp., including 31 pp. of advertisements; it is illustrated by numerous cuts, and has coloured paper cover.

Continued as:—

(29a) PHOTOGRAPHERS' (THE) ANNUAL, and Illustrated Almanac for 1870. A practical manual for the professional and amateur photographer, the beginner, the colourist, and the photo-mechanic. Edited by A. H. Wall; 1870; large 8vo.; price one shilling. Published by J. W. Green, *Illustrated Photographer* Office, 54, Paternoster Row.

Contains 70 pp., including 10 pp. of advertisements.

(29\*) INDIA, JOURNAL OF THE PHOTOGRAPHIC SOCIETY OF. Large 4to., six pp. "Issued free to members." No. 1 for May; No. 2, August; No. 3, Sept. 1887. Published by W. Newman & Co., 4, Dalhousie Square, Calcutta.

(30) INDIAN (THE) JOURNAL OF PHOTOGRAPHY. 1887. Edited by Professor Sheppard, 64, Dhurumtollah Street, Calcutta.

(31) JOURNAL (THE) OF THE PHOTOGRAPHIC SOCIETY OF LONDON. Containing the transactions of the Society, and a general record of photographic art and science. 8vo.

\* Continued from page 76.



vol i., nineteen Nos., 234 pp., March 3, 1853 to June 30, 1854. Edited by Arthur Henfrey, F.R.S., F.L.S., &c.

Vol. ii., twenty Nos., July 21, 1854, to Feb. 21, 1856; 320 pp. Edited by A. Henfrey.

Vol. iii., sixteen Nos., March 21, 1856, to June 22, 1857; 317 pp. Edited by J. R. Major, M.A., F.S.A.

Vol. iv., thirteen Nos., July 21, 1857, to July 21, 1858; 268 pp. Edited by William Crookes.

Vol. v., eighteen Nos., Aug. 21, 1858, to June 15th, 1859; 327 pp.

Vol. vi., fifteen Nos., July 15, 1859, to Sept. 15, 1860; pp. 336.

Vol. vii., seventeen Nos., October 15, 1860, to Feb. 15, 1862; pp. 388.

Vol. viii., twenty-four Nos., March 15, 1862, to Feb. 15, 1864; pp. 468.

Vol. ix., twelve Nos., March 15, 1864, to Feb. 15, 1865; pp. 210.

Vol. x., twelve Nos., March 16, 1865, to Feb. 16, 1866; pp. 278.

Vol. xi., twelve Nos., March 16, 1866, to Feb. 16, 1867; pp. 218.

Vol. xii., twelve Nos., March 15, 1867, to Feb. 17, 1868; pp. 200.

Vols. v. to xii. were edited by H. W. Diamond, M.D., F.S.A.

Vol. xiii., for 1868; pp. 210. Edited by H. W. Diamond and J. Spiller.

Vol. xiv., for 1869; edited by J. Spiller.

Vol. xv., 1870 to 1873; edited by J. Spiller and H. B. Pritchard; 232 pp.

Vol. xvi., edited by J. Spiller and H. B. Pritchard; 1874 to 1876; 164 pp.

(31a) NEW SERIES; vol i., for 1877, pp. 70.

Vol. ii., for 1878, pp. 108.

Vol. iii., for 1879, pp. 116.

Vol. iv., for 1880, pp. 134.

Vol. v., for 1881; vol. vi., for 1882; vol. vii., for 1883; vol. viii., for 1884; vol. ix., pp. 172, for 1885.

Vol. x., PHOTOGRAPHIC JOURNAL (THE), including the transactions of the Photographic Society of Great Britain for the session 1885 to 1886. Edited by Capt. W. De W. Abney, R.E., F.R.S., 8vo., pp. vi. and 178. Issued in nine monthly Nos., October, 1885, to June, 1886 (seven illustrated), 9d., catalogue number 6d.; one No. 3d. Harrison and Sons, 59, Pall Mall.

(32) KNOWLEDGE. *An illustrated magazine of science plainly worded, exactly described.* Conducted by Richard A. Proctor. 4to., 1881-88.+

No. 1 appeared November 4th, 1881, as a weekly, price threepence; published by Wyman and Sons, 75, Great Queen Street. Eight volumes appeared in this form, but in Vol. ix., commencing November 1st, 1885, the publication was changed to a monthly, price sixpence. Publishers Longmans, Paternoster Row.

Mr. A. Brothers contributed a series of articles on *Photography for Amateurs* to vol. i., and Mr. Slingo has contributed notes on the same subject to the later volumes.

(To be continued.)

## Correspondence.

### ORTHOCHROMATIC PHOTOGRAPHY.

DEAR SIR,—The description of "Mr. Bothamley's experiments with dyed films of plain gelatine" to which we referred in our former letter will be found in his paper published in the *News* of 11th March, 1887, page 147. He there states:—"The only method of any practical value for the purpose we are considering is to mix some gelatine with the dye under examination, spread a film

of it on glass or any other suitable transparent substance in the ordinary way, allow it to dry, and then examine the absorption spectrum of the solid dyed gelatine."

Mr. Bothamley says in his letter in the *News* of the 20th inst.:—"As a matter of fact, I did not make a single experiment with a film of plain gelatine."

We can, therefore, only conclude that as his former descriptive statement was given apparently in good faith as the result of his own investigations, that in this instance he appropriated the work of others, just as he annexed Tailfer's bath process, or a bad copy of it, for his own purposes, without a word of acknowledgment as to the original inventor.

In connection with this point we note that Mr. Bothamley, instead of giving a straightforward answer to our questions, again attempts to "throw dust in the eyes" of your readers by referring to the bath process used by him as distinct from Tailfer's patented process; as it is not our intention to allow the use of any process or formula which constitutes an infringement of this patent, No. 101, 1883, except under our licence or authority, we now demand from Mr. Bothamley a public acknowledgment in the *News* that the bath process he used and recommended is a copy and infringement of the above patent. Should we fail to obtain this acknowledgment we shall bring the matter before the "Chemical Society" on the ground that their grant is misapplied; we shall also take such legal proceedings as we may be advised.

In marked contrast to Mr. Bothamley's conduct in this respect, we would ask you to reprint the following extract from Col. Waterhouse's letter published in the *British Journal of Photography*, Feb. 25th, 1887. Col. Waterhouse says:—"I believe the first to practically apply eosine in collodion plates were the brothers Ducos du Hauron, and in gelatine work Messrs. Attout-Tailfer and Clayton, whose plates have been in the market for some years, and successfully fulfil all requirements. These gentlemen are, I think, fairly entitled to all credit and substantial benefit in the way of patents they can legally claim."

We have no wish to introduce personal matters into this discussion. Our only reason for taking any notice of Mr. Bothamley or his writings was that we did not wish his misleading statements and erroneous conclusions to go uncontradicted. The uncalled-for remark in his last letter, that "we cannot expect our statements to be accepted" in face of the opinions of others whom he chooses to regard as authorities, shows that Mr. Bothamley is evidently not aware that the researches and practical experience of Messrs. Tailfer and Clayton in France, and of others (including ourselves) in this country, although unpublished, have probably been far more extensive, and have certainly led to a more correct knowledge of the subject, than all the labours of the "authorities" from whom Mr. Bothamley seems to have derived his ideas.—Yours very truly,

B. J. EDWARDS & Co.

Hackney, January 31st, 1888.

### DR. VOGEL ON ORTHOCHROMATIC PHOTOGRAPHY.

DEAR SIR,—Will you kindly allow us space for a few words in reply to Dr. Vogel's letter which appears in the *News* of the 27th ult.?

It is unnecessary to enter into a long discussion as to the truth or falsity of the theory of "optical sensitizers;" we may, however, mention that all our experiments with various dyes, including a sample of "azalin," kindly supplied to the writer by Dr. Vogel himself, tend to confirm the views expressed by Captain Abney, that there is no truth whatever in the theory, and that the results obtained by Dr. Vogel and others can be explained on quite other grounds.

With regard to that part of Dr. Vogel's letter in which reference is made to our opposition to his application for a patent in this country, we need only reply that it is



not usual to discuss publicly a question which is *sub judice*, and as the case will very shortly come on for hearing before the Comptroller at the Patent Office, we do not propose to enter into it further than to express our surprise that Dr. Vogel is apparently so imperfectly acquainted with the chemistry of a subject on which he is supposed by some to be an authority.—Yours very truly,

B. J. EDWARDS & Co.

Hackney, February 8th, 1888.

#### CAPT. W. DE W. ABNEY ON ORTHOCHROMATIC PHOTOGRAPHY.

NOTICE in your issue of February 3rd, Capt. Abney's remarks on my theory of Optical Sensitizers. He repeats his old objections against my theory without convincing me at all. I have reason to hold a theory which has led me to a discovery, as orthochromist photography is a theory which is confirmed by the experiments of eminent scientists, as Becquerel, Dr. Eder, Schumann, Lohse, Hasselberg, &c., and acknowledged by authorities as Von Helmholtz, Kirchhoff, Bezold, Kuhnt, &c.

Capt. Abney don't read German; he is not in the condition to follow the scientific ideas which rule in Germany, or are developed there, except by translations, which very often give more of the opinions of the translator than of the author (as, for instance, also, in the book of Eder, on the Chemical Action of Coloured Rays, a book first translated in French, and then translated from French into English, two translations which should better have been done by a single one). Therefore I don't make him any reproach that he has not quite understood the principle which is called my theory. He cites for it a sentence of one of my letters, written, perhaps, ten years ago in English, and then he makes wrong conclusions from it.

I have said: "Really, a ray absorbed by certain dyes in the presence of silver salts acts more vigorously on this salt than non-absorbed rays."

"This says (so continues Mr. Abney) in other words, that to deprive a ray of part of its energy enables that ray to do more work."

I was surprised to read that! It seems that Captain Abney has forgotten Meyer's and Helmholtz's principle, called "Die Erhaltung der Kraft," a principle which says that *no energy is lost at all!* The energy a ray by absorption seems to have lost, is *not* lost, but only translated in other energies; for instance heat, or fluorescence, or *chemical action*, and this chemical action is it by which silver salts, mixed with the absorbed dyes in question, shall be decomposed.

My so-called theory is founded on *facts* not only observed by me, but also by the eminent scientists above mentioned. These facts are that certain dyes, mixed with silver salts, make sensitive the silver salts only for those rays optically absorbed by those dyes. These real well-established facts Capt. Abney cannot deny; also his theory gives no explanation at all over this connection between absorption and chemical action.—Faithfully yours,

H. W. VOGEL.

#### TYLAR'S METAL DARK SLIDES.

SIR,—Referring to Mr. Parr's contention as to my patent, I beg to inform you that I am quite prepared to contest my title thereto, and have already placed the correspondence before my solicitors.

I have no desire to obtain a gratuitous advertisement for my slides, as the large and increasing demand I have for them does not need it; neither would I stoop to so mean a trick; therefore I would suggest that this correspondence cease, and if Mr. Parr still fancies he has a grievance, let him seek redress in the proper channel.—I remain, sir, yours truly,

WM. TYLAR.

## Patent Intelligence.

### Applications for Letters Patent.

1612. CHARLES MONTAGUE LINLEY and JOHN BIGGS, 70, Chancery Lane, London, W.C., for "An improved device for carrying photographic apparatus on velocipedes."—Feb. 3, 1888.

1783. THOMAS COLLS, 3, Newhall Street, Birmingham, for "An improvement in stands for holding and displaying photographic and other portraits or pictures."—Feb. 7, 1888.

1960. BERNARD MCEVOY, 259, Stratford Road, Birmingham, for "An improved stand for photographs."—Feb. 9, 1888.

### Patent which has become Void through Non-payment of the Fourth Year's Renewal Fee.

5204 of 1883. H. GARSIDE, "Producing photographic surfaces."

## Proceedings of Societies.

### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE annual meeting of this Society was held at the Gallery, 5A, Pall Mall East, on Tuesday evening, February 14th, JAMES GLAISHER, F.R.S., President, in the chair.

The minutes of the previous meeting were read and confirmed, and the Hon. Secretary then read the report, in the course of which he referred to the continued progress of the Society. Coming to the subject of the last exhibition, he said that one of the most noticeable features in connection with it was the large increase in the number of portraits and figure subjects compared with previous recent years; whilst there was some decrease in the number of landscapes and architectural subjects. The increase of exhibits was chiefly due to professional photographers.

G. L. ADDENBROOKE, who has been acting as Treasurer during the absence from England of W. S. Bird, then read the financial report. He said, that with the concurrence and assistance of the auditors, W. E. Debenham and J. A. Mackie, the balance-sheet had been drawn up in a more detailed manner than had been customary, so that the members might see for themselves what was the amount of each department of expenditure. With regard to the rider which the auditors had appended to their statement, he said that in future an account would be kept of petty cash. He had thought it desirable to ask the Council to appoint a special financial committee to consider certain matters. Amongst other things, he might mention that from a conversation which he had had with the President of the Royal Society of Painters in Water Colours, he hoped that they would be able to have their requirements as a Photographic Society more adequately met than heretofore. It was impossible at present to go into details, but the whole subject must come before the Financial Committee. Although there was now cash in hand enabling them to make a further investment in consols, he had, in view of possible necessity for advantageous expenditure, not advised that this should be done. In conclusion, he wished to tender his thanks to the auditors for the assistance they had rendered him; the audit, moreover, was of an unusually heavy character.

Votes of thanks were then passed to W. S. Bird (treasurer), and G. L. Addenbrooke (acting treasurer), also to the auditors, W. E. Debenham and A. Mackie; and scrutineers, J. D. England, S. Samuels, G. Scammell, and J. Shew; and to Captain Abney as Editor of the Society's Journal. The result of the balloting papers for the election of officers was then brought up as follows:—

President—James Glaisher, F.R.S.

Vice-Presidents—Capt. Abney and H. Trueman Wood.

Members of Council—T. Bedford, T. M. Brownrigg, W. Cobb, A. Cowan, G. Davison, W. England, J. Gale, and S. G. B. Wollaston.

A. A. Common proposed, and F. Cobb seconded, a vote of thanks to the President, which was carried by acclamation.

The report of the Committee—T. Bolas, W. Cobb, W. E. Debenham, A. Mackie, and H. Trueman Wood—who had been appointed to inquire into the circumstances attending the non-production of a written protest against the election of a member at the November meeting, was then brought up. The Com-



mittee regretted that they could find no way of reconciling the conflicting statements that had been made. From the evidence they had taken they had no doubt that the protest had been made, but they had not been able to ascertain by what means it had disappeared.

The PRESIDENT then took up the consideration of the proposed new rules at the point where they had been left at the last special meeting.

On the rule being read over, "That no member's name shall be printed and circulated for election to serve on the Council before the consent of such member is obtained, and that each nominator shall hand to the Secretary the written consent of each nominee," W. E. DEBENHAM moved to substitute for this rule the original proposal of the Council, that "The Secretary shall inform by letter each nominee of the fact of his nomination, and no reply to the letter will be considered as acceptance of the nomination." He argued that to require the written consent of the nominees in the first instance, would, in the feeling of some who might be useful members of Council, put them in the unpleasant position of nominating themselves.

Captain ABNEY supported the amendment. He should not choose to put himself in the position of inviting election which the rule would require.

W. ACKLAND and F. BEDFORD also spoke in support of the amendment.

J. WERGE, as the mover at a former meeting of the rule, now argued again in favour of it. He urged that a member might be away from home and not receive the secretary's notice that he had been nominated, and so be elected, although unwilling and not intending to serve.

On a division being taken, thirty-four were in favour of the amendment, and one for the rule.

On the rule requiring that a circular letter calling attention to the right of nominating shall be sent to each member at his registered address, and also containing a list of the retiring officers, and the number of their attendances at council meetings, being read, it was proposed by Captain Maycock that such notice should be printed in the December number of the Society's Journal in place of being sent as a separate circular. This proposition was supported by Captain Abney, T. Samuels, and others, and carried by a majority of two.

T. BOLAS then proposed that the December number of the Journal should be published not later than the 18th of the month. This motion was supported by S. G. B. Wollaston, but was not pressed to a division.

The rule directing that the names of nominators should be published along with those of the nominees for election was next discussed.

J. WERGE moved that the names of the nominators be not published, and argued that such publication induced country members to give their votes to those who were supported by well known members as nominators, and the latter thus obtained an influence in the guidance of the Society beyond the influence which legitimately belonged to them.

W. E. Debenham, L. G. B. Wollaston, F. Bedford, and others followed on the same side, and the opposite view was taken by Capt. Abney, Capt. Maycock, T. Samuels, and others. Eventually the amendment was lost.

A paragraph in one of the rules authorising the publication of the names of defaulting members in the Society was on the motion of W. E. Debenham, who was supported by expressions of opinion by the President and others, ordered to be expunged, and the remainder of the rules were got through with little discussion, and a committee consisting of the Hon. Secretary, Capt. Abney, and G. L. Addenbrooke was appointed to make any necessary verbal alterations in the rules, before having them printed, and sent out to members to be finally balloted upon.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The usual weekly meeting was held on the 9th inst., J. BARKER occupying the chair.

D. A. LOUIS, F.C.S., who had been announced to read a paper on "Silver and its Salts," said it had been his intention to make several experiments that evening, in addition to reading a paper on a subject of so much interest to the members. Owing to severe indisposition during the past two weeks, he had been unable to carry out his intentions. He had, however, made notes on the subject, from which he would draw his discourse, at the same time promising to carry out his original intention with regard to the experimental side of the subject at another

meeting. The Lecturer, in referring to silver nitrate as one of the most important salts of silver, proceeded to describe the method of preparation. Melted and cast into moulds, it constituted the lunar caustic of the surgeon. The darkening of silver ornaments and utensils by the atmosphere of towns was due to sulphuretted hydrogen, the surfaces of the articles becoming coated with a film of silver sulphide. He advised the student to be careful when experimenting with oxides; explosive compounds were formed, such as silver fulminate, which had been frequently the cause of disastrous accidents. The combination of silver with the halogens was then referred to, and the rays that affect silver salts; also optical sensitizers. Silver chloride was next dwelt upon at some length, its formation by the addition of hydrochloric acid or a chloride to a solution of silver nitrate, and its darkening on exposure to light, the change being accompanied by a loss of chlorine. The question of a sub-chloride or argentic chloride being consequently formed, was not definitely settled. Further discussing the action of light on silver chloride in sealed tubes, the chlorine evolved re-combining in the dark, the Lecturer then proceeded to deal with bromide and iodide of silver, concluding with reference to Carey Lea's experiments and the photo salts. The Lecturer took a wide range, and was listened to with much interest.

W. H. HARRISON, remarking upon the admirable and concise summary of information in connection with silver salts that the Lecturer had put before them, said past experiments had thrown but little light upon the formation of what he would call the latent or invisible image. The phenomena of the reversibility and re-reversibility of the image was an interesting subject: could the Lecturer throw some light upon it?

A curious fact in connection with the reversibility of image was referred to by P. EVERETT as the result of development. A friend of his exposed a plate in contact with a negative; this was developed with the ordinary pyro developer; a weak positive only was obtained; this not being satisfactory, it was decided to use another developer. In the semi-darkness of the dark room a bottle containing a solution of ferri-cyanide of potassium was mistaken for the pyro solution. Finding the image rapidly disappearing the second developer was thrown off and the plate washed. Another pyro developer was made up and poured upon the plate, and the result was, that instead of a positive, a weak negative was obtained.

A. HADDON asked whether chlorine would be re-absorbed if the chloride of silver was quite dry?

J. J. BRIGNSHAW referred to a simple experiment that fully demonstrated the fact of the liberation of chlorine that took place after exposure to light of silver chloride. The chloride is placed in a bent tube closed at one end, and the other immersed in a bottle of distilled water. After exposure to light for some days, the distilled water would give a precipitate on the addition of silver nitrate. It could also be proved by another simple experiment: a piece of paper steeped in iodine pot. starch suspended in a bottle, at the bottom of which is placed some chloride of silver; on exposing this to light, the paper will rapidly turn colour, caused by the evolution of chlorine.

The CHAIRMAN remarked that the subject was one of special interest to him; he had made many experiments with the silver haloids. It was in the direction of increased sensitiveness that they would have to look. He considered some of Carey Lea's results unreliable.

D. LOUIS, in reply, said he had not experimented in the direction of the reversibility of the image sufficiently to give a decided opinion. With regard to the question of the silver chloride being absolutely dry, it would not absorb the liberated chlorine, but it also would not do so if absolutely wet.

The CHAIRMAN, in proposing a vote of thanks to D. A. Louis, remarked upon the large extent of ground he had traversed in his lecture, and of the value and interest of the subject to photographers in general.

A. COWAN exhibited an opal, 20 by 16, printed-out and toned.

H. M. HASTINGS had still further improved his apparatus for flashing magnesium powder shown at the previous meeting, in the direction of simplicity. It was found that many were unable to bend the glass tube properly: he had, therefore, substituted a small glass funnel, to the small end of which the pneumatic ball and tube were attached. The bend to hold the charge was made by simply tying the india-rubber tube in a loose knot near the bottom of the funnel. Its efficiency for the purpose intended was proved by flashing several charges.

E. Brownlie was elected a member of the Association.



## CAMERA CLUB.

On Thursday, February 9th, experiments in photographing by artificial light, and a discussion of the subject, were opened by J. F. Roberts, who read a paper on photographing theatrical scenes by the ordinary illumination, using orthochromatic plates. Mr. Roberts described his method of working, and gave some of the details of his treatment of plates with erythrosin. &c. After the reading of the paper, portraits were taken on orthochromatised plates, the light used being the incandescent gas light, which had been fitted up in the room by the Welsbach Company for the purpose. Other exposures were made in comparison with these; in some, Mr. Hart's apparatus for blowing magnesium powder through two flames being used; in others an ingenious contrivance devised by Mr. Hastings; and in others again the limelight; a composition called magnesiopyre, made up by J. C. Hunter, of Glasgow, was also used.

The discussion was taken part in by Messrs. Lyonel Clark, Maskell, Hart, Traill Taylor, Plomer, Rodgers, Hyslop, England, and Henry, and a communication from G. Hcaley was read, giving his experience in photographing groups, &c., at a bazaar, by means of magnesium ribbon.

On Thursday, February 23rd, the evening will be devoted to lantern slides.

## BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE usual fortnightly meeting of the above Society was held at the Technical Schools, Bridge Street, on the 9th inst.

GEO. WILKES exhibited carbon prints taken from the reversed side of Eastman paper negatives, which showed very little difference from the ordinary way.

There was a discussion on "Testing the Strength of Liquid Ammonia."

Speaking of the use of our peroxide of hydrogen—is much washing needed?—W. J. HARRISON said it was not to be recommended, as it will bleach pictures.

E. J. COX: The use of hydroxyl (hydrogen peroxide) is recommended by Abney for eliminating the last traces of hypo-solution. It is both an oxidizer and reducer; it has, however, no action on the metallic silver of the film, and is found to convert the hypo into sulphate, an innocuous compound (photographically).

## NORTH LONDON PHOTOGRAPHIC SOCIETY.

At the ordinary meeting on Tuesday, February 7th, at Myddelton Hall, Islington, J. TRAILL TAYLOR, President, in the chair,

LEWIS MEDLAND delivered an interesting lecture, entitled, "In Northern Latitudes with a Camera," illustrated by about 200 lantern pictures, which were exhibited for the first time. The lecturer, in a very concise style, relieved by occasional touches of dry humour, led his audience from London to the Baltic, thence to St. Petersburg and Moscow, and back again, and kept his hearers so thoroughly interested that at the conclusion of his discourse they were surprised to find that nearly two hours had passed, and that a couple of hundred views had been exhibited and explained. The room was filled to its utmost capacity, a large proportion of the visitors being ladies.

At the next meeting F. W. Hart will explain the action of his hypo eliminator, and will also make a further demonstration of the magnesium flash lamp.

## EDINBURGH PHOTOGRAPHIC SOCIETY.

THE fourth meeting of the current session was held in the Professional Hall, 20, George Street, on Wednesday evening, February 1st, at 8 o'clock; the President, W. FORGAN, occupied the chair.

J. M. TURNBULL introduced the subject of transparency making, and gave a brief sketch of the progress which had been made since photography had been employed in the preparation of pictures for exhibition, by means of the optical lantern. He also showed a variety of slides in illustration of his remarks, pointing out, in the examples thrown upon the screen, what to imitate and what to avoid. Mr. Turnbull indicated that the thinnest possible emulsion should be used in coating plates intended for transparencies, but at the same time rich in silver. A quick development also was recommended as conducive to clean, clear work.

A good many members took part in the discussion which followed.

W. FORGAN said he had recently measured the thickness of an ordinary gelatine film, and found to his surprise that it took 2,500 to make the thickness of an inch.

The PRESIDENT urged the members to be preparing for the forthcoming exhibition of members' slides on the 16th inst.

J. MCGILASHAN exhibited an arrangement for making transparencies by reduction from half plate and larger negatives. It was considered a simple and efficient piece of apparatus. The negative is held upright in an adjustable framework while the camera slides back or forward in a grooved board.

W. CROOKE demonstrated his manner of using the new magnesium powder light. A group was arranged and taken by flash. On developing, it was found to have sufficiently manifested the capabilities of this light, even the dark wood-work on the walls of the room being defined. Mr. Crooke remarked that when we were more familiar with its management, this light might be extremely useful, and doubtless would be largely employed.

A. H. BAIRD exhibited several portraits taken with the new light.

Votes of thanks closed the proceedings. The attendance was large, and several ladies were again present.

## First Popular Evening.

The First Popular Meeting of the season was held in Queen Street, Hull, on Wednesday, 25th January, when the Rev. Wm. Logan, Lanark, delivered a lecture on "To Norway and Back by the Gt. Sunniva," to an audience of nearly a thousand persons. A hundred transparencies were shown, taken by Archibald Brown, of Caledonian Wood Works, Lanark. A ten days' tour, including the principal places of interest northwards from the Hardanger Fiord, occupied the evening in an instructive and pleasant manner. The views were remarkably good, and occasionally were much applauded. During the evening several Norwegian songs were sung, and violin and pianoforte selections given. J. M. Turnbull and A. Brown were at the lantern. Votes of thanks followed the completion of the programme.

## LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.

A REGULAR meeting was held in the Mayor's Parlor, Old Town Hall, on Wednesday, February 8th, GEO. BANKART in the chair; there was an excellent attendance of members.

J. T. WILKINSON gave his demonstration on the "Manipulation of Stripping Films," a supply of which had been generously provided by the Vergara Company, Eastman Film Company, and Mr. Pumphrey, Birmingham; the development and after processes of which afforded the members a scientific treat. Mr. Wilkinson having described the various processes, the solutions requisite for each, and their particular uses, proceeded to demonstrate, in a practical manner, the *modus operandi* of each particular process. The experiments were an undoubted success, the development of the negatives, which had previously been exposed by the makers, being watched with considerable interest, and following the instructions kindly furnished with the films, they were carried through the various stages in a masterly manner; and although in one or two cases the stripping was not so perfect as could be wished, it was felt that was not detrimental in any degree to the practical usefulness of the process, but was owing rather to the insufficient time which the exigencies of the meeting could afford to the proper drying of the films.

At the close of the demonstration a hearty vote of thanks was passed to those firms who had sent specimens of their films, and to Mr. Pumphrey for the numerous specimens of apparatus used in his process, and the excellent specimens of work done by his process. Mr. Wilkinson was also heartily thanked for his kindness in showing the members this newest application of photography, and in reply Mr. Wilkinson, after acknowledging the vote of thanks, introduced the Photographers' Benevolent Society to the notice of the members, which he was one of the earliest to introduce, and which resulted in several donations to the Society he represented.

The PRESIDENT then introduced to the members the new Wolf's mounting cards, which were eagerly scrutinised and appropriated.

## BIRKENHEAD PHOTOGRAPHIC ASSOCIATION.

THE ordinary meeting was held in the Free Public Library on the 9th instant, President JOHN H. DAY in the chair.

A. F. Edwards was elected as a member.

J. A. FORREST handed round for inspection an interesting



Daguerreotype of M. Dagnerre himself, done by Spencer, the first photographer ever in Liverpool, and the discoverer of electro-plate.

PAUL LANGE exhibited a lantern slide of the eclipse of the moon on the 28th ultimo, one of a series of six he had taken in its different phases, which was excellent and full of detail, showing out well on the sheet with its dark background. A number of transparent spots were thought to have been caused by dust, but Mr. Lange stated that he found them in the same place on each negative, proving conclusively that they were stars, whilst under the microscope a large number were observed which were invisible to the naked eye. For microscopic purposes it was thought that collodion would have yielded better results than gelatine, the inequalities of the film when highly magnified seriously affecting the integrity of the image, though in the lantern this was, of course, not observable.

Several members gave their experience of trying to photograph the eclipse, their main difficulty being to get their cameras tilted to a sufficiently high altitude, one gentleman having recourse even to a step ladder in lieu of the ordinary tripod.

B. J. SAYCE had substituted a telescope for the lens, but the amount of refracted light thrown on the focussing screen from its inside brasswork had prevented him exposing a plate.

Asked for his *modus operandi* of working, Mr. LANGE stated that he had used a studio camera stand, thereby being able to get any angle of view he wished; by using one lens only of his Ross' rapid symmetrical he obtained an image of increased size, the exposure being with an ordinary rapid plate,  $\frac{1}{4}$  cap off and on.

A competition then took place for a silver medal offered by F. Evans for a set of four lantern slides all printed from the same negative, preference being given to the set showing the greatest variety of colour. The contest was a keen one, and the judges, Messrs. Atkins, Sayce, and Sylvester Parry, had considerable difficulty in arriving at a decision, having, after the slides had been passed through the lantern several times, to finally retire to another room for their further examination. On returning, Mr. Atkins announced the distinguishing mark of the set they thought entitled to the prize, when the President announced that the Secretary (G. A. Carruthers) was the winner. Their colours were black, burnt sienna, Vandyck brown, and blue.

In answer to an inquiry, Mr. CARRUTHERS stated that he had used Verel's chloride plates, and had obtained the various colours after considerable experimenting—the black with ferrous oxalate, the sienna red with carbonate of soda and pyro, the slide, when thoroughly washed and dried after fixing, being immersed for about ten minutes in bichloride of mercury and iodide of potassium solution, washed and dried again, and finally plunged into a strong solution of ammonia and water, when it at once loses its positive appearance and turns the colour named. The Vandyck brown required a precisely similar treatment, excepting that the plate has to be kept in the ammonia considerably longer; if left too long it would, of course, blacken. The blue slide, which was the only one of that colour exhibited, excited some interest; it had been developed with ferrous oxalate to which was added a small crystal of sulpho-cyanide of ammonia. This gives a pale brown tint, but on pouring over it some gold from the stock bottle (one grain to each half ounce of water) it flashes out blue at once, and can then be fixed without suffering any change.

The competition was followed by a further display of slides, some of local views from negatives taken twenty-five years ago by Mr. Sayce exciting much interest.

A vote of thanks to Mr. Evans, who worked the lantern, terminated the proceedings.

#### SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

A MEETING was held on January 10th, President WALKER in the chair.

The minutes of the last meeting having been read, the meeting proceeded to deal with some considerations as to the constitution of the Society, a motion to change its name to the New York Camera Club being lost.

The President then announced that several gentlemen had contributed towards a Beck portrait lens, with iris diaphragm, for the use of the members, and a vote of thanks was tendered for these presents.

## Talk in the Studio.

THE STEREOSCOPIC COMPANY'S EXHIBITION.—This Exhibition, now open at 110, Regent Street, closes on the 29th inst. A further sum of £15 has been contributed to the Photographic Benevolent Association, making a total of £47 3s.

DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC SOCIETY.—The following awards have been made: *Gold Medals*—W. H. Hyslop, W. J. Byrne, Green Brothers, and H. Tolley. *Silver Medals*—H. Tolley, Clarisse Miles, L. Owen, J. Matthewson, Vergara Film Company, W. J. Finlayson Johnstone, J. and R. Annau, R. Keene, West and Son, W. M. Martin (2), Weruer and Son, W. Ferrier, J. E. Tunney and Company, W. Crookes, W. W. Winter, F. M. Sutcliffe, M. Auty, and C. E. Wyrall. *Bronze Medals*—W. W. Winter, J. Moffatt, A. S. Watson, H. C. Pettitt, J. C. Cox, J. H. Hogg (2), M. Auty, G. Lowdon, C. G. Collins, W. Wray, T. S. and W. Taylor, J. R. Wilson, P. Feathers, P. Lange, Marie Sandeman, and Dr. Albone.

PHOTOGRAPHIC CLUB.—The subject for discussion on Feb. 22nd will be "Pocket and Detective Cameras."

THEY SPEAK OUT PLAINLY IN AMERICA.—The following, in the *St. Louis and Canadian Photographer*, is under the head, "Rogue's Gallery," and is embellished with a telling portrait of the person concerned; the portrait having the proper name underneath:—"This is a fair representation of the duds personage who figured in a dishonest transaction at Davenport, Iowa, also at Little Rock, Ark., and whom we published in our December dead beat list. He will do photographers more damage on account of his outward appearance being that of a perfect gentleman, and a good talker. His mode of operating is to start a gallery, it matters but little where, but more particularly where photographers are on friendly terms; reduce the prices for cabinets to a mere song, secure a big rush by displaying fine samples from the best New York galleries, and when he is in danger of being exposed clear out. He manages to hire, not own an outfit, hence he can easily skip out. Photographers, be on your guard and expose him at the start; do not let him remain over night."

## To Correspondents.

•• Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

SEAMUR.—Read the article of H. Trueman Wood which has just appeared in the NEWS.

WM. MAYOR.—The water colour sold in tubes, with the addition of a little prepared ox-gall if required.

W. W. R.—1. Develop the paper rapidly, and you will obtain the tint to which you refer. 2. Paint them on with tube colour—either oil or water—using a very fine sable pencil.

J. R. HOWARTH.—If brought under our notice in the ordinary way, it will be dealt with.

TIOS. BOULTON.—Make it slightly warm. Dip it in ordinary negative varnish, and dry before the fire.

RECIPRO.—No, you can only recover the price of the photographs.

J. W. ELTON.—See the YEAR-BOOK.

V. W.—The price is about £6, and they are sold by Lezard and Son, 38, Holborn Viaduct, London. That sent to us for review is in daily use, and performs excellently.

A. J. MAAS.—1. They are good value for the money, but we should recommend you to buy the best obtainable. 2. Only up to a certain point—a point approximately corresponding to their price. 3. Far better; you can quite depend on such an instrument. 4. We have not seen them, and consequently can give no opinion.

PYRO.—1. We do not think it is on sale in this country, but perhaps Marion, of 22, Soho Square, can get it through his Paris house. 2. Unless you are a skilled mechanic, your best way will be to obtain from a craftsman such a platform or wheel work as serves for a "Pantehnicon" van, and then to construct the studio upon this.

DIDDLE.—If you do as you propose, you may get into trouble. Deliver the goods and take action in the County Court to recover the price.

M. WOLFE.—Order through a foreign bookseller the following works, which are all low in price, the most expensive not costing five shillings:—Husnik's "Lichtdruck" and Husnik's "Helio-graphie," both published by Hartleben, of Leipzig, Germany; Schnauss's "Lichtdruck," published by Dr. Licsegang, of Cavallerie Strasse, Dusseldorf, Germany.





# THE PHOTOGRAPHIC NEWS.

Vol. XXXII. No. 1538.—February 24, 1888.

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## PHOTOGRAPHS AND APPARATUS AT THE CRYSTAL PALACE.

"Far better than I expected," was the general remark on Monday, the opening day of the exhibition of photographs and photographic apparatus at the Crystal Palace. Indeed, we are inclined to think that, everything considered, the photographic exhibition now open at Sydenham is the best show of things photographic we have had in London.

To reach the Crystal Palace is not always a very easy or expeditious process for the Londoner, unless he knows the way and time: as a casual goer to Ludgate Hill may—as we proved—have to wait an hour for the next train, and then spend over three-quarters of an hour on the journey. But, in spite of the unsatisfactory arrangements for transit, and the ocean of mud which has to be traversed in going from station to Palace—mud which a spark of enterprise on the part of railway company or Palace directors would clear away—we counsel every one interested in photography to visit the Palace and see the photographic collection.

The collection of photographs is thoroughly representative, and we have not only the photograph proper, but also the offensive conventional show-case portrait—that curious combination of strained theatrical pose, photography, and retoucher's handicraft—and also the combination-printing sheet. The latter is, perhaps, in its least offensive form when it merely consists of a landscape and sky totally at variance; indeed, this is its most common form, the more exaggerated development of combinationism consisting of printings from several negatives in which out and indoor objects are mixed up in greater or less confusion and multiplicity, according to the more or less exuberant stage-scene fancy of the constructor.

We do not propose to criticise the photographs themselves at great length, as a large proportion of those shown have been at previous exhibitions, and are known to those of our readers who acquaint themselves with current matters: indeed, if it were not so, the collection could not be so thoroughly representative as it is.

The general management of the exhibition seems to us to be excellent with one exception, which we had better clear off first; and this exception is the considerable offence of placing before the assembled Press representatives a ready-made puff of a few exhibits—a practice which we have several times deprecated of late, and which is, we are sorry to say, on the increase.

The document in question was presented to each guest at the Press dinner, and the main portion reads as follows:—

### *Ready-made Notice offered to Press-men.*

In size of exhibit the firm of Marion and Company come first, and their many novelties, in every branch, are well worthy of attention.

Then come the firm of Mawson and Swan, Watson, The Eastman Dry Plate and Film Company, who show, besides their well-known roll-holders and systems for paper negatives, an entirely new departure in the way of American studio cameras, and never before shown at any exhibition in Great Britain.

These are some of the principal exhibitors, but the whole space is taken up with exhibits, and worthy of note.

The north nave is given up to the Art side of photography, and on this side there are 3,200 examples of amateur and professional work.

Van Der Weyde shows some beautiful portraits, which have perhaps never been surpassed.

Winter, of Derby, has some beautiful things, perhaps the best being one entitled "My Mammy." There is a charm and sweetness about this picture of a little child and its mother, and an extreme naturalness that marks it for praise.

Lafayette and Werner, of Dublin, send some fine portraits.

Amongst landscapes there are some lovely views by Green, of Keswick, giving an excellent rendering of atmosphere.

The pictures by George Davison, the well-known Secretary of the Camera Club, are also worthy of mention.

It may be supposed that this sort of thing is harmless, and that respectable papers will not be influenced by such attempts to dictate what is to be said; but, as an instance to the contrary, we may refer to the following extract from the report in so generally reputable a paper as the *Daily Chronicle*—an extract in which the officially-favoured names are grouped together almost in the order of the official puff, and, indeed, the wording of the official puff is largely adopted.

### *The Ready-made Notice as Modified by the Daily Chronicle.*

Amongst the largest exhibitors are Marion and Co., Mawson and Swan, Watson, and the Eastman Dry Plate and Film Company, who show, besides their well-known roll-holders and systems for paper negatives, an entirely new departure in the way of American studio cameras, never before seen at any exhibition in Great Britain. Van Der Weyde have some beautiful portraits, and Winter, of Derby, exhibit excellent specimens, one of the most charming being that entitled "My Mammy," an extremely natural picture of a little child and its mother. Lafayette and Werner, of Dublin, have sent some fine portraits. Amongst landscapes there are lovely views by Green, of Keswick, giving an excellent rendering of atmosphere. The pictures by George Davison, the well-known secretary of the Camera Club, are also worthy of mention.

The *Standard* and some other papers adopt the ready-made puff with more considerable modification.

We defer that which we have to say about the photographs till next week, and now confine our remarks to the apparatus department, where numerous novelties of considerable interest are to be found.

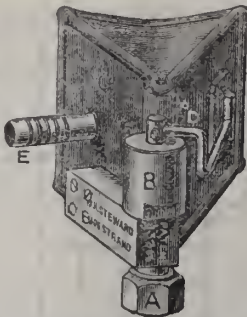
Dallmeyer shows a new lens of the single combination appearance, although we understand that it has perhaps more analogy with a doublet having both lenses at the same end of the tube, which promises extremely well, and



which we hope to notice in detail shortly. It is called the "Rectilinear Landscape Lens," works with an aperture of  $\frac{1}{4}$  downwards, and gives straight lines, so that it is suitable for architectural work and copying. An instrument of this class has long been wanted.

Another novelty of Dallmeyer's is a central shutter on the iris diaphragm principle, having four or six leaves, and working between the glasses of the objective. Concerning this instrument, with which we are very much pleased on account of its compactness, ease of work, and completely balanced action of moving parts, we purpose to say more when we can speak with more mature knowledge.

A compact and cheap self-acting regulator for gas issuing at high pressure from the iron cylinders now so generally used, is a thing long wanted, and the need seems well supplied by an instrument manufactured by Steward, of the Strand and Cornhill. The governor in question is illustrated by the subjoined block.



It consists of a miniature gas bag which in opening operates a screw which shuts off the supply from the bottle, so that a constant pressure of about twenty-four inches of water is maintained in the bag. We saw it in action, and its performance was certainly admirable. Some arrangement of this sort is almost an essential to the lantern operator, as the constant adjustment of the valve screw is very difficult while facing an audience.

Further notes of the abundant collection of apparatus must be deferred till next week, but we may now give the following official particulars as to the system of judging.

Each judge is to be provided with a schedule of classes on commencing work, together with a slip notifying the classes in which he is requested to act. He will then proceed alone to the various exhibitors' stand, and select the exhibits (in each class and each section of the class) he may think worthy of being awarded marks, according to the following scale, viz: 9 "highest possible," 7 "very good," 5 "good," 3 "fair," 1 "commendable." These marks will be added up by the executive committee without alteration, the highest aggregate for any exhibit or series of exhibits obtaining the medal, and those exhibits standing 2nd and 3rd will each obtain a certificate of honourable mention. It shall be within the judges' discretion to recommend any exhibit or series of exhibits for a special medal apart from the rest of the awards, in which case they will notify their intention by writing the word "Special" instead of a number after their entry, and if three out of five so agree, an additional medal shall be awarded. In the event of an equality of marks, the executive committee shall in every case have the right to make the majority in favour of the exhibitor whose exhibits, in their opinion, possess the greatest merit.

#### PHOTOGRAPHY AND METEOROLOGY.

An exhibition of apparatus connected with atmospheric electricity, lightning conductors, photographs of lightning, and other objects bearing on meteorological science, is to be held at 25, Great George Street, Westminster, from March 20th to 23rd next, and the exhibition committee

appointed by the Meteorological Society invite co-operation, as they are anxious to obtain as large a collection as possible of such apparatus, &c.

The Committee state that they will also be glad to show any new meteorological instruments or apparatus invented or first constructed since last March, as well as photographs and drawings possessing meteorological interest.

Those willing to co-operate in the proposed exhibition should furnish particulars (not later than March 1st), with a list of the articles which can be contributed, to the assistant secretary, William Marriott, 30, Great George Street, S.W.

#### THE SQUARE OF THE DISTANCE ACTINOMETER.

BY D. WINSTANLEY.\*

ONE of the advantages I look for in instruments constructed on the principles laid down on page 56 of the present volume is, that no error arises from the unequal illumination of the sky, and no error from absorption by different thicknesses of semi-transparent substances. Whatever diffusion or absorption is effected by a film of tissue paper is effected alike for every hole (presumably) in the case of the instrument depicted in the fig. 2 given on that page. With coloured media this is otherwise. The amount of absorption of actinic rays by different thicknesses is not proportional thereto, and, so far as I know myself, it has not been accurately determined; whilst exposure to the open sky through holes of differing magnitude means simply exposure to differing angular magnitudes of sky, which at the best is very unequally illuminated.

The actual dimensions of the particular instrument of which a description was briefly given in my last are as follows:—

Surface exposed to light (the upper one in the figure),  $5\frac{1}{4}$  inches long.

The hypotenuse or silvered paper side (the sloping one in the diagram),  $5\frac{9}{16}$  in. length.

The wide end (the one upon the left),  $3\frac{1}{8}$  in. deep.

The narrow end is one inch deep, and the thickness from back to front also is an inch.

From these dimensions it will be seen that the apparatus will go readily in the breast coat pocket, where, as a matter of fact, my own is as I write.

The light admitting surface is covered by a diaphragm having ten square holes therein, one over the termination of each tube. The sides of the squares measure five-sixteenths of an inch exactly, and the thickness of the material of this diaphragm is less than the one-hundredth of an inch. The lower and longer surface is provided with a similar diaphragm, and over this the sensitive paper is secured, whilst white tissue paper covers the diaphragm above.

I have, however, constructed four other instruments upon this model, which vary in length from three to twelve inches. Their apertures vary from  $\cdot 3$  of an inch to one inch square; their depths in the first or shallowest cell, from three cell diameters to  $\cdot 3$  of one, and the proportional depths of the first and last cells from 1 and 3 to 1 and 6 or thereabouts.

The results I have obtained thus far in my experiments are curious, but I will defer the discussion of them until the experiments themselves are more numerous, and my appliances for making them more perfect. I find considerable difficulty with the sodium flame for comparing the intensity of tints which differ in colour. A tint produced in sunshine is of a warm tone, whilst one produced beneath a clouded sky is cold. No colour is in either case visible in the light emitted by the sodium flame. They both look like shades of grey—mixtures of black and

\* Continued from page 56.



white, in fact. I find, however, considerable difficulty in their accurate comparison, as I have failed thus far to get a steady and a brilliant sodium flame.

I shall be glad if Captain Abney, or any other experimentalist who has had much experience of it, can help me in this matter. When I published my daylight diagrams in 1875 I was working in circumstances which differed materially from those in which I am working now, and I was enabled to abandon the sodium flame entirely, and obtain an invariably definite colour which could be compared for intensity in lights which were both bright and steady.

The theory of the rotating cylinder actinometers I have described already (Nov. 11th, 1887, and Jan. 20th, 1888) is very definite, and very clear, and so seemingly is the theory of the square of the distance instrument. Assuming that our light does vary in it inversely as the square of the distance, and in no other perceptible way,

the following are the ratios of quantity and difference at the different distances specified.

Distance.	Amount of Light.	Difference.
1 (inch)	1.000	
1.2	.694	.306
1.4	.510	.184
1.6	.390	.120
1.8	.308	.082
2.0	.250	.058
2.2	.206	.044
2.4	.173	.033
2.6	.147	.026
2.8	.127	.020
3.0	.111	.016
3.163	.100	.011

And these are graphically represented in fig. 1.

From this diagram it will be seen that the first six tints are fairly comparable, but that the differences afterwards

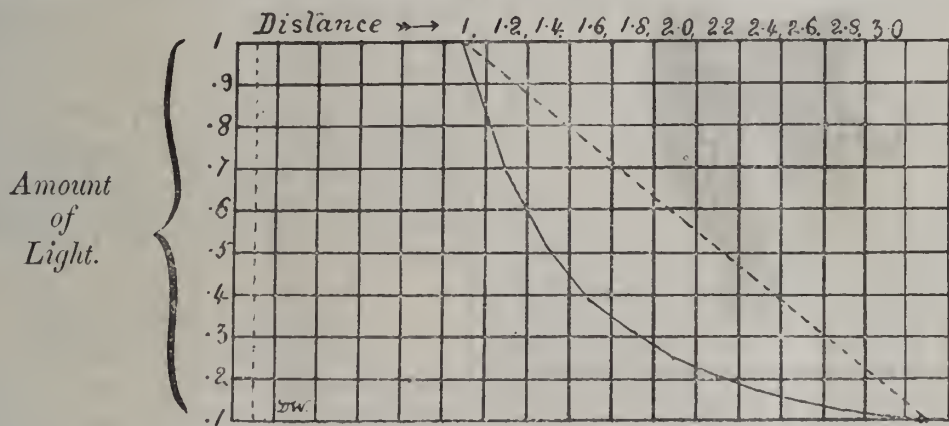


Fig. 1.

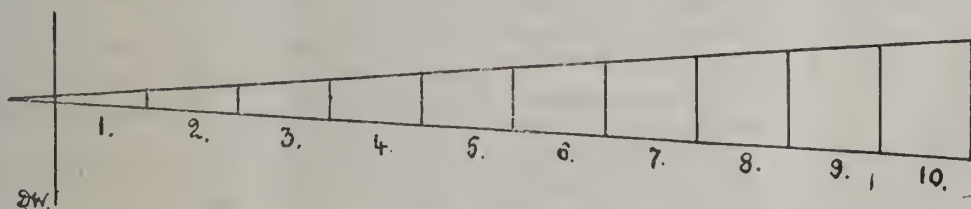


Fig. 2.

become so slight that the remaining tints would be practicably indistinguishable. This I find to be the case. On the other hand, when sufficient exposure has been given, the last six tints become comparable enough, but the first ones are then "burnt up." This I also find to be the case.

There is, however, a very simple and a very elegant method of correcting the inequalities of difference in illumination made manifest in the foregoing table and diagram. This method of correction—whilst it of course leaves the physical facts alone—makes the instrument into one yielding quantities of illumination inversely as the distances, and not inversely as their squares. This method consists in the geometrical enlargement of the apertures by which the light is admitted to the cells. Take, for instance, the distance 2, at which the amount of light is .25, or quarter part of what it is at the distance 1. By doubling the area which admits the light, we shall clearly double the amount of light admitted, and raise it from one-fourth to one-half of what it is at once, and if each aperture is dealt with in a properly proportionate way, it is obvious that we may easily make our gradation of tints to be what we please, and therefore easily make our units of light to correspond with units of linear measurement as indicated by the dotted line in the diagram, fig. 1.

After trying various figures and various modes of computation, I have arrived at the following elegant method as at once the simplest and the best.

Draw a straight line upon a sheet of whatever material the upper diaphragm shall be made of, and let this line be one-twentieth longer than the combination of cells which the diaphragm is to cover, and construct a triangle upon it as seen in fig. 2. Cut off from this triangle, and at its apex end, one twenty-first portion of its length, and divide the remainder into ten parts equal to each other in their measurement from left to right, and the result will be ten trapezium-shaped spaces having areas in proportion to the numbers 1, 2, 3, and so on up to and including 10.

If this triangular space be now cut out, and the sheet from which it has been removed be mounted over the system of cells with the truncated apex over that which is the shallowest, we shall have an inverse of the distance actinometer, and not an inverse of the square, i.e., if our cells also have been proportioned in arithmetical progression in their mean depths. Thus, if the aperture 1 gives the illumination  $\frac{1}{100}$  at the distance 10 (i.e., proportionally to the square inversed), clearly the aperture 10 will give the light  $\frac{1}{100}$  or  $\frac{1}{10}$  (i.e., as the inversed distance), and if the aperture 1 gives the light  $\frac{1}{9}$  at the distance 3, the aperture 3 will give  $\frac{1}{3}$ , and so on throughout the strip.

(To be continued under the heading "Experiments in Actinometry.")

Erratum :—At the end of the ninth line above fig. 2 on p. 56, instead of  $A_x$ , it should be  $A^2_x$ .—D. W.



## A WINTER'S DAY ON LOCH LOMOND WITH THE CAMERA.

BY ROBERT DAVIES.

I HAVE often heard my photographic friends—both amateur and professional—say, towards the end of September or beginning of October: "I have done my camera work for this year, at all events, and have packed up all safely, and put by in a dry cupboard, until next Easter, at the earliest."

Now I think the sooner the photographic fraternity disabuse their minds of the idea that nothing good can be done in the winter months the better it will be for them. I have no doubt the eyes of a large number of them were considerably opened after having perused that very able article written by Mr. Valentine, of Dundee, to the photographic papers some eighteen months or two years ago, upon "Winter Photography." It certainly had the effect on your humble servant of always making him keep his camera in readiness for any exceptionally fine day that might crop up, such as the ones we had on Christmas and Boxing Day last; days, by-the-bye, on which I succeeded in doing excellent work, and which would compare most favourably with any done during the summer months.

I had been fortunate enough to obtain a week's holiday towards the end of November in last year, and immediately set about finding some place to spend it in, when, very opportunely, a great friend of mine living in Glasgow, an ardent amateur and medallist in the last year's Glasgow Exhibition, invited me to spend the time with him, holding out as an inducement an offer he had received from an acquaintance of his living at Alexandria, to give him a day's outing in his steam launch on Loch Lomond. It need hardly be said with what avidity I jumped at this. The evening after the day I had received this letter saw me at St. Pancras with all my kit, ready to start by the night train. The coldness of the journey, and the heartiness of the welcome awaiting me at the end of it, go without saying.

After having spent two or three very foggy and unproductive days in Glasgow, Campsie Glen, &c., we elected to start on the Friday morning early from Queen Street Station for Balloch, where we were to meet our friend of the launch. Our early breakfast, before leaving, was not a lively affair (I do not by this refer to the viands, which were of the best), nor were either of us in the very best of humours, the weather outside still being a repetition of what we had already experienced for several days. However, something having raised our spirits—it might have been the breakfast, or it might not—we resolved to go on.

When Glasgow had been fairly left behind us, the day improved remarkably. In fact, by the time we arrived at Dumbarton, glimpses of sickly sunshine were seen trying to struggle through the shifting clouds of mist, which eventually they succeeded in doing by the time we arrived at Alexandria. When Balloch was reached not a cloud was to be seen in the sky, nor even one solitary ripple on the calm, still loch. The day, from a photographic point of view, was perfect, with just a slight touch of frost in the air. This tended, if anything, to increase the crisp and sharp outline of the surrounding mountains, some of which already were mantled with coats of dazzling white. We found our friend and his neat little craft in readiness at the pier, and very shortly we were on board, and under weigh. It had been settled that our first point to touch at and erect the cameras should be at Lennox Castle on Inchmurrin, the largest of the islands. This castle, now in ruins, was in former days a fortress belonging to the Earls of Lennox. Immediately opposite this fortress or castle, on the mainland, is the Fruin water: the glen through which it winds before entering the loch was the scene some two hundred years ago of a savage fight between the

Macgregors and Colquhouns. Sir Walter Scott, in his boat song in the "Lady of the Lake," alludes to this:—

Proudly our pibroch has thrilled in Glen Fruin,  
And Banochair's groans to our slogans replied;  
Glen Luss and Rossshda they are smoking in ruin,  
And the best of Loch Lomond lies dead on her side.

We secured a couple of very good bits on the above island, one of which embraced the old fortress. From here we retraced our steps somewhat, and then followed the usual steamer track to Balmaha, skirting round the southern side of the island. Shortly before reaching Balmaha we were roused from the contemplative mood into which we had, more or less, fallen. Whether this was owing, however, to the beauty of the day and surrounding scenery, or to the fact that the inner man was beginning to cry out, is not my duty here to state, but roused we certainly were by a cry from our host, "See the Ben" (Lomond). There, high away above us, in the bright blue of the sky, and almost overhanging the islands in the loch, was what at first sight appeared to be a dazzling white cloud. I have seen snow mountains in Switzerland in all their different phases of storm and sunshine, but never was I so thoroughly enchanted as I was by that first peep of Ben Lomond with the winter's snow covering its summit. Doubtless, the very unexpectedness of such a sight had a great deal to do with the pleasure it afforded.

Upon rounding Inch Caillaich, which contains an old burying ground of the Macgregors, with the yew trees mentioned by Sir Walter Scott:—

The shafts and limbs were rods of yew,  
Whose parents in Inch Caillaich wave  
Their shadows o'er Clan Alpine's grave,  
And answering Lomond's breezes deep,  
Soothe many a chieftain's endless sleep.

Before reaching Luss we manœuvred the launch in and out of the numerous little islands which lie between this and Balmaha. The photographer might spend a most productive day "making pictures" among the little bays, nooks, and straits, lying in and about these islets; one more secluded nook in particular, I mean to take the earliest opportunity of revisiting, viz., between Inch Tavannach and Inch Connachar. The soft beauty of the water and the deep colour of the trees here have something of untouched nature about them that is especially pleasing to a dweller in towns like myself.

At about one p.m. we anchored at Luss, and there enjoyed a most delightful and varied midday meal prepared on board the launch. This was washed down (and also introduced at becoming intervals during the feast) with some most excellent "mountain dew," originally the property of our host.

We got one or two nice little bits in and about a small farmstead on the mainland close to Luss; but as the time was getting on, and the captain wished to have his boat safely housed at Balloch again before dark, we packed our traps together, and proceeded on our journey to a point some three miles further up the loch, in order, if possible, to get a good peep of the Ben. This we were fortunate enough to do somewhere about Craighentua or Culag, a mile and a-half short of Inveruglas Inn, which is on the opposite shore, almost immediately facing Rowardennan. Here we managed to take some very fair views, the steamer coming in in a handy manner to fill up the foreground. The view up towards the head of the loch from this point looked extremely beautiful with its winter colouring, Ben Voirlich, Ben Lui, and several other mountains in the distance standing out in bold relief with their summits tipped with snow. This particular view very forcibly reminded me of the one looking up the Lake of Geneva towards the Rhone Valley from Vevey, the grouping of the mountains in both cases being very similar.

As the evening lights had already begun to creep up the mountains, we received a peremptory notice to return to the boat, our captain wishing to get under weigh again



and make for the moorings at the lower end of the loch, some miles away still.

The return journey, although retrospective, was almost as beautiful in its way as the outward one, the light of the setting sun bathing the tops of the various mountains on the eastern side of the loch in one uniform rosy tint, which, as time went on, turned gradually into the cold grey of a frosty evening. By 5.30 p.m. we arrived at our journey's end, and having had one more snack to show our appreciation of the air we had been enjoying, we raked out the fire, and saw that all was snug and taut, and then betook ourselves to the dingey, and pulled slowly to the shore, still some three-quarters of a mile off, the moon by this time shedding a bright cold light on all around, a fitting end to one of the most enjoyable days I have ever spent in or among the Scotch lochs. I may here add I was given to understand by our host that there are many such days as this to be got in winter on this particular loch, but with regard to the other lochs he was not able to speak, as he had had no experience of them; he, however, believes that the fine winter days are peculiar to this loch alone.

One word, before closing this article, on the camera and lenses I used. The camera was a very portable whole-plate after Scott's pattern; the lens, one of the American Star Company's Rectilinear Lenses—a better one I do not wish for—and a set of Darlot's in case, which I used whenever it was necessary to take in a wide-angle. The plates all three of us used were Paget's 60-times.

## THE LATENT IMAGE.

BY W. LANG, JUN.\*

The attempt to discover and explain the nature of the latent image is as old as photography itself. Two theories of development have from time to time been put forward, and they have received respectively the names of the physical and the chemical. According to the first of these, light, when acting upon silver salts, was supposed to throw the component atoms of each molecule into a state of vibration, so that when the developer was applied separation of the metal from its haloid followed as a consequence of this vibration. The second theory—and which perhaps found the greater number of supporters—assumed that the effect of light on, say, silver chloride or any other haloid salt of silver, was to convert it to what is known to chemists as a sub-salt, this sub-salt being capable of being reduced by the developer, while the normal chloride, iodide, or bromide, are unaffected by it. The proof or disproof of either of these two theories is by no means a simple matter. I only refer to them here in order to lead up to the subject matter of this communication. Carey Lea—who, according to his own words, had been experimenting for three years in the laboratory for the purpose of trying to throw further light if possible on this vexed question—last summer, in the *American Journal of Science*, has added a third theory.

His theory is that the light acting on a haloid salt of silver converts it into what he has termed a photo salt, which is a compound in which the sub-chloride, sub-bromide, or sub-iodide is in chemical combination with the chloride, bromide, or iodide originally present. These photo salts have been prepared in quantity by the American experimentalist not by light, but by a chemical process. The photo-bromide, photo-iodide, and photo-chloride are here for your inspection on the table before you. It would be beyond our province to go into all the reactions by which photo-salts can be prepared—and they are many. Recourse for this purpose must be had either to the original memoir, or to the reprints in the photographic journals. It would further be occupying too much time to follow the author in his attempt to prove the identity of the

latent image with the photo combination of silver chloride, and its sub-chloride. What I purpose more especially calling your attention to this evening is the nature of two reactions which Carey Lea brings forward to prove his case. These two are—first, the action of a solution of sodium hypophosphite on a silver haloid; and second, the phenomenon to which Lea has given the name of image transference.

Before going further I may here mention that I have not found time to carry out a systematic series of experiments, which I should have liked to have done, to have practically illustrated the facts to which I am calling your attention this evening. I can, however, show you the effect of an application of the sodium hypophosphite on a bromide paper (Eastman's). The small wooden printing block which you see here was brushed over with the hypophosphite solution, and in the light of the dark room was pressed down on the sensitized paper, being retained there for about a minute; the paper was then steeped in water, and development with ferrous-oxalate, as recommended, resorted to. That an action has taken place, the paper with the developed impression now passed round will sufficiently demonstrate.

Regarding the action of the hypophosphite we cannot do better than give Carey Lea's own description. "A silver haloid formed in the absence of light, and subjected to the action of sodium hypophosphite, gives rise to the gradual formation of sub-salt, which combines with the normal salt in the manner already described," that is, forms a photo compound. His mode of operating is to work photographic paper in a solution of an alkaline haloid dry, and afterwards apply a silver solution, the latter operation to be of necessity in non-actinic light. The paper is then thoroughly washed, and when dry is ready for experimenting with.

Quoting Carey Lea: "Marks made on this paper can be developed with the oxalate developer with the utmost facility. If a strong solution of hypophosphite is applied cold it may be washed off at the end of a minute, but a stronger impression is obtained by allowing it to wait half an hour before developing; or the action may be accelerated and increased in strength by laying the freshly-marked paper on a hot surface; or better, by steaming it before applying the developer. Paper prepared with a solution of KCl, KBr, or KI, dried and floated on acidulated solution of silver nitrate and well washed, if marked with strong hypophosphite solution and steamed for two or three minutes, will develop the marks as black as ink on a white ground. The use of heat simply gives a blacker development, but a very vigorous image can be got without."

In reading over our author's directions one thing occurs to me, and regarding which one would like to have some explanation, and it is with reference to the developer employed. Ferrous oxalate is spoken of throughout as the developer employed, by which we would understand the ordinary developer used in developing bromide prints. Now it is quite clear that such a form of developer would not do where the chloride of silver is concerned, as a general reduction would take place all over. I hope at no distant date to be able to find the necessary time to experiment for myself, and I trust I then shall have actual results to bring before our association. I am not going to enter into all the experiments brought forward by Carey Lea to prove the identity of the nature of the latent image produced by light, and by the application of the hypophosphite, but it is very curious to note how in the two cases the action of nitric acid before development is completely identical. Silver chloride and its latent image was almost unaffected, silver bromide to a slight extent, while silver iodide was entirely destroyed. Surely this must be something more than a coincidence.

Allow me now to call your attention to the second phenomenon, that of image transference, and I think you will agree with me that it is a most interesting one. Taking paper that has been coated with an organic salt of silver—

\* Read before the Glasgow Photographic Association.



say a tartrate, a citrate, or an oxalate—and exposing to light under a negative, the organic salt present being afterwards converted into a chloride or a bromide by immersion in diluted solutions of these acids, on applying a developer, after having well washed, the image starts into view as if the silver chloride or silver bromide had been impressed in the first instance. This reaction is one which would be well worth studying. Many curious facts in connection with the subject have been observed by its discoverer. For these I must refer you to the paper itself. Perhaps Lea's work is too chemical in its nature to be fully appreciated by the ordinary professional photographer, but I think all our members should, at least, see for themselves the original memoirs; and if this somewhat fragmentary communication has the effect of calling your attention to what are really a series of masterly researches, then, fragmentary though it be, it will not be without some good result. The chemistry of the silver salts has not yet been completely written.

## THE PHOTOGRAPHIC EXHIBITION IN DUNDEE.

### OPENING CEREMONY.

The following is from a report in a local newspaper:—

The Photographic Exhibition in the Albert Galleries, under the auspices of the Dundee and East of Scotland Photographic Association, was opened yesterday by Mr. J. M. Keiller of Birkcaldy and Morven. Professor Carnelley of University College, the Hon. President of the Association, occupied the chair, and the ceremony was attended by a large assemblage of ladies and gentlemen, among whom were ex-Provost Robertson, ex-Provost Moncur, Mr. A. D. Grimond, Mr. J. F. B. Firth, Mr. A. J. Buist, ex-Bailie Robertson, Mr. F. Henderson, Mr. J. M. White, Mr. J. J. Barrie, Mr. Thomas Bell, Mr. Victor Frenkl, Mr. J. C. Bell, Dean of Guild Mathewson, Mr. H. McGrady, Dr. Wilson, Rev. Colin Campbell, Rev. Dr. Short, Rev. R. Waterston, Rev. C. M. Grant, Mr. J. E. Robertson, Mr. A. J. Brough, Principal Peterson, Professor Stegall, Mr. Thomas Murdoch, Mr. W. N. Walker, Mr. R. Murdoch, Mr. William Ritchie, Mr. G. B. Simpson, Mr. C. C. Maxwell, Mr. R. L. Watson, Mr. W. B. Thompson, Mr. W. D. Valentine, Mr. T. S. Robertson, Mr. J. R. Gilroy, Mr. Marshall Wane, Mr. James McLaren, Mr. Charles Ower, Mr. Leslie Ower, Mr. J. M. Smieton, Bailie Macdonald, Bailie Doig, ex-Bailie Philip, Dr. Templeman, Dr. Lennox, Mr. G. G. MacLaren, Mr. D. Ireland, Mr. J. A. Rollo, Mr. W. M. Martin, Mr. John MacLachlan, Mr. G. D. Macdougald, Mr. J. A. H. Macnair, Mr. J. D. Miller, Mr. J. Russell, Mr. T. Murray, &c.

The Chairman said he thought the Society could scarcely have chosen a more suitable person to perform the opening ceremony than Mr. Keiller, considering his great sympathy with all things connected with art, which he had shown by the encouragement of art, and also by the pecuniary help he had given to art in the town. Those of them who had visited the last Exhibition would, he was sure, have still pleasant remembrances of the evenings spent at it. There were one or two points in connection with such an exhibition which he thought were occasionally overlooked. Many people seemed to regard photography almost exclusively as a matter of art, simply as a matter of taking portraits or views. There were many things, however, in science and otherwise to which photography had been applied with the greatest effect and benefit, and he had always had an impression that in connection with a photographic exhibition something should be done in the way of illustrating the practical and scientific application of photography. Another thing which one might have in addition to the ordinary exhibition of lantern slides would be a series of short lectures illustrating or explaining how photographs were taken, with a dark room fitted up so that people wishing to become photographers might obtain instruction for a small fee. He thought that this would add very much to the interest of such an exhibition. In conclusion he introduced Mr. Keiller.

Mr. Keiller, who was cordially received, said at the outset that he had to acknowledge the honour which the Dundee and East of Scotland Photographic Association had conferred upon him by asking him to take a leading part in the function of that day, and to thank their Honorary President, Professor Carnelley for the kindly words in which he had spoken of him, (Mr. Keiller).

He fancied that, after the experience of the past few weeks, it must be a relief to a Dundee audience to be addressed on any subject other than politics. From politics to pictures was a considerable jump, but he trusted that their feeling of relief would be all the greater, and make them all the more inclined to be lenient towards himself in the performance of a duty for which he felt himself indifferently qualified. After accepting the invitation of the Committee, he considered it incumbent on him to acquire some knowledge, however superficial, of the technical processes which were employed in photography. He had some of these described and illustrated to him by a local amateur, and he had thus succeeded in acquiring a jumbled smattering of phrases about focuses, fixing, developing, toning, pigments, and plates, and so forth. He came to the conclusion—he did not claim any originality for it—that a little knowledge was a dangerous thing. He thought he was treading on safer ground when he posed before them as an admirer—he trusted as an appreciative admirer—of the beautiful specimens which they saw adorning these walls. He was sure that such an Exhibition as this must impress them with the fact that photography had played a very important part in the history of our times. There was, he ventured to say, no more wonderful discovery made during the century in which we lived, than that which enabled men to render permanent a shadow, and to delineate in face and form a figure or a landscape by the aid of a ray of sunlight. Hardly less wonderful, and certainly not less creditable to the men who had effected this, had been the rapidity with which the art had developed. He thought that, on viewing the beautiful specimens of platinotypes and calotypes which were collected together in the hall, they would admit at once that knowledge and enterprise and tact had been possessed, and possessed in no small degree, by those who had engaged, whether as professionals or amateurs, in the study of photography. In their circular the Committee gave as one of their reasons for holding this Exhibition, the fact that there was unfortunately to be no exhibition of paintings this year. He did not suppose that the most ardent votary of photography would pretend that it ranked or stood on the same platform with that art which endeavoured to interpret the moods of nature in colour with brush and pencil, but he thought that if they looked at the different degrees of success with which different men effected the posing and grouping of figures, and in the taking of landscape or marine views, they would readily admit that photography lent itself to a large extent to the display of art and artistic feeling. In the Exhibition, which they would have an opportunity of viewing immediately, they would find specimens of work by all the eminent artists in the different parts of the country, who were attracted by the prestige of their local Association, and the liberality of the programme. They would also find, he believed, some specimens from foreign parts. They had some from Siam, and he believed that in one part of the room they would find some from Japan. Nothing, however, would, he thought, give them greater pleasure than to notice that the students of art who hailed from Dundee and district were still in the forefront of the friendly contest. While they appreciated the pleasure and profit to be derived by the study of photographs, they must not be forgetful of the service it had rendered in the world of science. It had been a great help in botany, in zoology, in architecture, and mechanics. It had been used successfully in the detection of crime, and also in war, as instanced by the plans with which the German army were furnished in the Franco-German war, and which, he believed, were produced by some process of photography. The Association were doing very good work, as they could see from the exhibits around them. It was also doing other work, to which Professor Carnelley had incidentally referred, which perhaps did not come so much before the public. He understood that its members occasionally gave lectures to the inmates of the different charitable institutions, illustrated with magic lantern slides, and thus did their best to enlighten and brighten the lives of many of their fellow creatures, whose lot had been less fortunate than their own. Before sitting down, he thought he might be allowed to make a suggestion. He would humbly suggest that they should institute a competition of, say, the best twenty views of different parts of our tramway rails, taken in different parts of the town, the prize to be awarded to the views which showed the biggest holes and the highest projections of the metal above the causeway. It would form an interesting collection, and might be dedicated to the Police Commissioners, and serve to bring the matter under the notice of that body, as it seems to have been hitherto beneath it. In time the collection might become rare,



and might be sought after by collectors, but it would, at any rate, give evidence to future generations of the long suffering and patience of the present race of Dundonians, and how they were sacrificed for the interests of a few shareholders of a Limited Liability Company. He then said he was sure that they could congratulate themselves on having such an energetic and vigorous body in their midst as the Dundee and East of Scotland Photographic Association. They were indebted to the Association for their painstaking labour in having gathered together such a fine collection of the masterpieces of photographic art. That the public would show their appreciation of the efforts of the Association by rendering this exhibition, like its predecessors, a financial success, and by their frequent attendance would give the Association the cheering assurance that their educative influence was not unfelt, was, he was sure, the hearty wish of all present. Mr. Keiller concluded by declaring the Exhibition open.

Mr. G. D. Macdougald, on behalf of the Association, proposed a hearty vote of thanks to Mr. Keiller for the great service he had rendered in opening the Exhibition.

Mr. Leslie Ower proposed a vote of thanks to the Free Library Committee for having granted the Association the use of the Galleries, and he thought Dundee was extremely fortunate in having such gentlemen to manage the institution, and in having gentlemen who devoted their liberality to forward art in Dundee. He was sure they all wished the accommodation at their disposal would soon be increased, and that the result of the movement would heartily taken up by Mr. Keiller, Mr. Orchar, ex-Provost Ballinghall, Provost Hunter, and others would be that before the next triennial Exhibition of the Association Dundee would be in possession of a set of galleries which would do justice to the exhibits which were sent to the town.

Ex-Bailie Robertson, in the unavoidable absence of Provost Hunter, replied on behalf of the Committee.

Mr. T. S. Ross proposed a vote of thanks to the judges, Mr. Marshall Wane, Mr. W. D. Valentine, and Mr. J. G. Orchar. The Association was under considerable additional obligation to Mr. Wane and Mr. Valentine from the fact that they had foregone their right to become competitors, and they were also further indebted to Mr. Valentine for sending some beautiful frames for exhibition.

Mr. Wane replied on behalf of the judges, and said that their task had been insignificant compared with the labour of classifying and hanging the exhibits.

On the motion of Mr. W. M. Martin, a vote of thanks was awarded to Professor Carnelley for presiding, and the proceedings terminated.

### THE MAGNESIUM FLASH LIGHT.

It may not be out of place at this time, when magnesium, as a means of furnishing a powerful artificial light, is occupying the attention of so many photographers, to consider briefly its history and development from the time of its little utility until the present, when it is successfully used by so many for making instantaneous photographs at night.

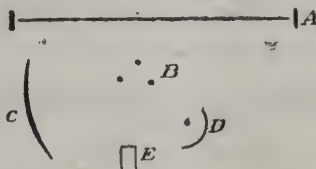
The researches of Bunsen and Roscoe first called attention to the great light power of metallic magnesium when burned. Photometric examinations showed a magnesium wire of 10 m.m. long and 0.3 m.m. in diameter to be capable of evolving a light equal to that furnished by 74 stearine candles, and but 36.6 times less than that of the sun when at an altitude of 37 deg. above the horizon. But in those days the metal was far too expensive for practical photographic purposes, and it was, therefore, but little used, except in experiment and in unusual cases.

It was not until the sixties of this century that the magnesium light began to be practically applied for photographic purposes. Piazzi photographed the interior of the Cheops Pyramid by its aid; Nadar secured pictures of subterranean passages; Mariat made photographs in the Adersbach rocks; and we, in America, photographed the interior of coal mines, and secured, on collodion plates, fine illustrations of the coal deposits and subterranean strata.

At that time magnesium ribbons were used. They were coiled upon a reel, and unwound by means of clock-work as fast as the metal was consumed; thus the light could be maintained steadily so long as the ribbon lasted, and well-exposed collodion plates were secured with its aid. It was discovered later that a far more intense light could be obtained by burning magnesium in pure oxygen than in ordinary atmospheric air, and this prob-

ably suggested the advantages of burning the metal with substances which easily and freely give off oxygen. As early as 1865 we find that similar compounds to those now recommended by Gaedike and other experimentalists were employed.

When the method for preparing the metal by means of electrolytic processes was discovered it became so much cheaper than formerly, that a new impetus was given to experiments with it as a consequence. The greatest activity was shown at Berlin, Germany, and without doubt credit is due to Messrs. Gaedike and Miethe, of that city, for having first made the light practicable for general workers. It was at once eagerly adopted all over the photographic world, and various modifications were suggested for using it. Gaedike himself, whose researches have been the most systematic, calculated that it requires 15 grains of metal to amply illuminate a subject for photographing. It must be remembered, however, that Mr. Gaedike had contrived an ingeniously constructed glass lantern for burning the magnesium, which was provided with a chimney for carrying off the products of combustion.



A, background; B, subject; C, side screen; D, source of light; E, camera.

The amateur, however, who but occasionally makes a photograph or interior by magnesium light, must resort to more simple means. An easy method for making single portraits or groups of three or four is to place the subject against a background considerably lighter than is required by daylight, and at such a distance as to prevent shadows from being cast directly upon it. A circular reflector is placed obliquely against the subject, the camera stationed at its proper place, and the source of light at the side to be principally illuminated, and at an angle of 30 degrees, and shaded by a curved sheet of tin, which also serves as a reflector, as may be seen in the diagram.

If the light be placed at about 60 inches from the subject, the objective being a Wale 10 inch or a 4.4 Gundlach rapid-rectigraph, 10 grains of metal in compound, or with gun-cotton, is sufficient to give a perfect exposure upon a Carbutt special plate. For greater distances the light force must be increased, and it may be fair to say as much as 60 to 90 grains will be necessary to light a large hall.

To retain the actinic qualities of the magnesium light no substance should be employed in the compound which tends to deteriorate its colour; gun-cotton makes the light yellow; the addition of much carbon or sugar produces too much smoke, and indiscriminately chosen explosives make the flash-light powders dangerous. Gun-cotton is probably the safest medium, notwithstanding all that has been said against it.

The highly interesting experiments of Drs. Rich and Mason indicate much further reaching results than seemed to be promised by their first experiments. Dr. Rich purposed to add pulverized zinc to the magnesium, and the resulting flame showed an extremely fine colour, although the combustion was slow. If by a properly prepared compound of zinc and magnesium a slow burning light, with the average good quality of pure magnesium, can be provided, we shall have an artificial flash-light powder for long exposures; a light which seems superior to the electric arc light, and of considerably less expense.

Whatever modification or result from the various compounds proposed may be finally settled upon as, all things considered, the best for artificial light, we are sure that magnesium in some form has a useful future before it for photographic purposes.—*Photographic Times*.

### Notes.

"Idylls of the Norfolk Broads" is a portfolio of twelve autogravure plates from negatives by Dr. Emerson, with an accompanying text. It does not come to hand in time for such notice as it deserves this week; but in our



next issue we propose to say something of this, which we incline to regard as the best series of "Emerson's Photographic Pictures." We say pictures advisedly, as Emerson has shown us how to make pictures by photography. He has succeeded in making pictures by trying to reproduce nature with the camera, and, in trying, he has cast aside the methods of the theatrical scene constructor, who first makes an unnatural concoction in the solid, and then photographs it; and of the photographic combinationist, who glues together—although sometimes the glue is only metaphorical—scraps of nature and scraps of construction, making thereof a non-whole. Still, the combinationist has fulfilled a useful function in the evolution of photography towards the position of a branch of the fine arts.

Some time ago, it will be remembered, a case at a London Police-court made it clear that the Customs House authorities had been for more than a dozen years paying a pension granted to a retired Custom House boatman, to his son. In defence it was urged by the son that his father, on his death-bed, had handed him his pension paper as though it had been a legacy, and it was also pointed out that the Custom House people were much to blame for continuing to pay without enquiry the pension of a man who must, according to the date of his retirement, have been at least 109 years of age, had he still been living.

Now the publication of these facts naturally caused a great stir in Government circles. Questions were asked in the House of Commons, the Treasury interviewed, and the most elaborate inquiries were made in order to make it certain that no other abnormally aged pensioners were still on the Government pension list.

The results of the investigation were to a great extent hushed up; but if rumour may be believed, it was found that much laxity had undoubtedly prevailed in paying pensions; especially in obtaining satisfactory proof of the identity of the pensioners. And well-nigh ever since the Treasury has been busily engaged in perfecting some scheme which should make a repetition of the incident detailed at the police-court impossible. And now it seems, according to the latest rumours, it has been definitely decided that the aid of photography shall be called in to prevent any future payment of a son in place of his father, and, in fact, to make it certain that the money granted by a grateful country to its retired servants shall not get into the wrong pockets. This means, in short, that the Paymaster-General will, in future, be provided with a photograph of each man or woman to whom he is ordered to pay a pension, taken, it is to be presumed, on the day of his or her retirement. It may be assumed, then, that the ponderous tomes in which the ever-increasing army of Government pensioners are registered will henceforth be transformed into huge photographic albums; and that it will be necessary for a pensioner who may suddenly be obliged to take to blue spectacles, or may elect to shave off his whiskers, or grow his moustache, duly to lodge a new photograph at the Paymaster-General's office before claiming his pension in his altered condition.

To us, as practical photographers, we must admit that this proposal, if it is really decided upon, seems open to several objections. But, at the same time, we would suggest one way in which photography may be made to do the taxpayer good service by aiding the cause of national economy.

At present, it is well known there are scores—nay, hundreds—of able-bodied, active men in this city, who have for years past been on the pension list. They have been sent adrift on one pretext or another, but the result is always the same. Their pensions, to the tune of many thousands a year in the aggregate, have to be paid out of the national funds. This is one of the most crying scandals of the Civil Service, this pensioning off of men in their prime. What we would suggest, therefore, is that henceforth the House of Commons shall summarily refuse to recognise any claim for pension on behalf of any public servant, unless his photograph be laid on the table of the House, together with the Treasury warrant awarding the pension. Let the House insist on this being done, and there will not be so much chance, at all events, of a Government clerk retiring on account of ill-health with a large pension, and at once proceeding to assume the management of a big bank; or of civil servants on the sunny side of forty being positively paid a special bonus on condition that they retire on pensions, and thus open the way to fresh appointments, and renewed nepotism and jobbery.

Let our plan be tried this session. When the Estimates come on for discussion the House will be asked to vote close upon half a million sterling for "Superannuation Allowances." In every new case, then, let it insist on seeing the photograph—and a good large realistic one let it be—of the proposed pensioner. It will certainly add to the interest of the discussions on Committee and Supply, and likely enough, too, it will result in saving John Bull's pocket. In any uncertain case the Speaker could be directed to summon the original and the doubtful photograph to the Bar of the House, and if this were done once or twice we should hear of no more pensioning of men in the prime of life merely because their places are wanted for other favoured clerks. Mr. Henry Labouchere, if he be now well enough to attend to the matter, might at once put a question to the Secretary of the Treasury on the subject; and we venture to say that the very knowledge that Parliament would insist on the photograph being presented before any new pensions were voted, would of itself have the effect of materially reducing the shamefully bloated rate for "Superannuation."

Last week, in referring to the action of the authorities of St. Paul's Cathedral in blocking out the public from anything like a near sight of the new reredos, we pointed out that to study the details one must journey to some place where photographs are exhibited—say to Spooner's in the Strand. Since then the London Stereoscopic Company have sent us a very fine 12 by 10 photograph, which can be seen somewhat nearer to the Cathedral, as they are sold by Griffith and Farran opposite. Still the Cathedral authorities should adopt our suggestion of hanging one up in some well-lighted part of the Cathedral.



A useful suggestion was made at a meeting of the Society of Arts the other day in the discussion of a paper on "Type-writers," one of the speakers stating that he had found it possible to make excellent lantern-slides by printing on gelatine in a type-writer. It is often required to put tabular matter in the form of a lantern slide, and this would appear to be an excellent way of doing it; but, like many other good ideas, is likely enough not to occur to many lecturers who would be glad to avail themselves of it as soon they are told of it. For such a purpose the little wheel type-writers which are worked without a keyboard can serve just as well as the more expensive and complex instruments.

In the last of the very interesting course of Cantor lectures on "Etching and Engraving" which Professor Herkomer has just concluded, he stated very fairly the case of the artists as against photogravure. The Professor's notion is, that the artist can, or ought to be able to, see in every picture the black and white underlying the painting, by which is meant, when translated into language to be understood of the people, that the artistic engraver can tell the best possible manner in which any picture in colour can be rendered in black and white. To attain his end, the engraver may have to exaggerate some features, and to subdue others, his aim being that the result of his work should produce as nearly as possible the same feeling, or the same ideas, in the spectator, as the work of the original artist. A very good example of this, mentioned by Mr. Herkomer, is the ordinary ease of enlarging. Many a picture which is charming on a small scale, is spoilt by enlarging; and many another, which on a small scale looks crowded and unsatisfactory, gains strength and vigour when enlarged. So it is with translation from colour into monochrome. Mere copying, even the most accurate, is not enough. What is wanted in the engraving is not a servile rendering of the brush marks or of the effects which can be got by colour and colour alone, but a faithful rendering into another language of the ideas expressed by the original artist in his own language. Now this is all absolutely true, but how far does it apply? How many artists are there in the country who are capable of this sort of work? Ask any painter who has had his pictures engraved; ask Professor Herkomer himself, who gave a lively account of the method by which engravings are now produced for the trade. Nobody who knows what he is talking about will say that any photographic process ever invented can or will produce work like the etchings of Rembrandt, or like the exquisite work turned out by Mr. Herkomer himself; but what is the fact, and what the whole tribe of mechanical engravers may deny as long as they like without in the least altering the fact, is that a good photogravure is better than an average engraving. Mr. Herkomer himself admitted as much, and indeed went on to draw the moral that photographers ought to improve their processes so that they might entirely dispense with hand-work. We should then have mechanical reproduction at its best. The conclusion is one which few photographers will be inclined to dispute.

The state of the atmosphere during the recent eclipse of the moon was as unfavourable for photographic observations in France as in England. M. Janssen had made extensive preparations at Meudon for photographing the phenomena, but the murkiness and the clouds frustrated his intentions. At the Marseilles Observatory, M. Stephan was a little more successful. Thanks to the comparative clearness of the air, the observers were able to study the occultation of stars up to the eleventh magnitude. A negative of the eclipse taken by a London photographer with a quarter plate lens, which we have seen, has something almost absurd about its appearance. The moon is about the size of a very large pin's head; nevertheless, the observation is very distinct. The development took nearly three-quarters of an hour. The photograph was taken more as a joke than anything else, but it is very successful, and would well bear enlargement.

It looks as if Mr. Besley read the PHOTOGRAPHIC NEWS. Some two or three weeks ago we suggested that when anybody met with an accident caused by another's negligence, the photograph of the injuries received would be good evidence in a court of law. At the hearing of the aristocratic assault case last Saturday, when the plaintiff enumerated the bruises he bore, Mr. Besley, the defendant's counsel, remarked, "Better have them photographed and get them enlarged, because I cannot see them." This notion is evidently based upon our suggestion. Should the hint be taken in any future assault case of a like nature, it must be made imperative that the negative be produced in court. By a skilful manipulation of the negative during printing a black eye could easily be manufactured. Prints, consequently, must not be relied upon alone.

Instantaneous photography is being made use of to a large extent in sporting circles. We noticed recently a book on football so illustrated, and Messrs. Longman announce that the next two volumes in their Badminton library will be on boating and cricket generally, both of which will contain a number of engravings from instantaneous photographs. It is a pity that the photographs themselves were not reproduced, as an engraving, however well rendered, is not the same thing.

The *Inland Printer* has an interesting article with the suggestive title, "Photo-Engraving as observed from a Printer's Standpoint." It is the opinion of the writer that the progress of the art has been greatly retarded by the ignorance of the experimenters—chiefly photographers and electrotypers—of the requirements of the printer. He observes that "when a photographer attempts to make an article to be used by a printer with such knowledge as he may have occasion to use in his own business, and is uninformed as to the merits of a printing art, he must not blame the printer for offering up a slight objection to the merits of his work." Singling out one commercial process as to the best in the market, he finds the fault which belongs to all photo-engraving processes in a more or less degree: that when used upon an ordinary quality of paper it becomes impracticable, for the reason that the



very fine linings are of such a small depth as to cause them to be filled up with the fine fibres of the paper, and thus present a smudgy appearance.

A fine wood-engraving is easier handled than the half-tone photo-engravings, and the problem which process-workers have to solve is how to obtain greater depth while retaining the fine soft effect. In speaking of reproduced pen and ink drawings, the writer is inclined to blame the zinc etcher a good deal for the defects frequently noticeable. In the rush of work and the competition of cheapness, the zinc etcher does not give the plate sufficient care, attention, and time, and the consequence is engravings are turned out which can only be used by the printer with great difficulty. But sometimes the fault lies with the photographer. The negative must be very dense, and in intensifying there is tendency to produce ragged lines.

The writer certainly hits the nail on the head when he says there has been a downward tendency in zinc etching. The competition has been in the direction of low prices, and not in the direction of excellence; the consequence is, as the writer says, "There does not seem to be money enough in the business to entice those who would no doubt remove its many imperfections."

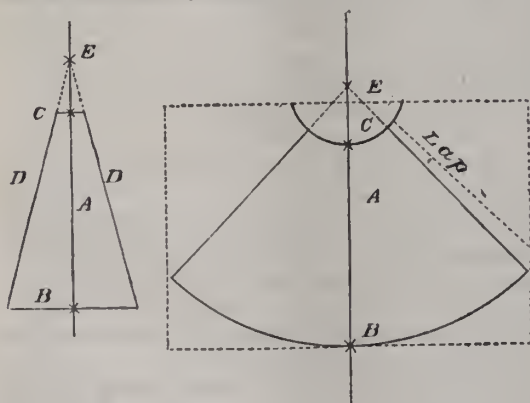
#### A SIMPLE METHOD FOR MAKING AN EXTENSION CONE.

BY C. D. CHENEY.

ALLOW me to begin by advising the use of comparatively long focus leuses in landscape work; the advantage—aye! the need of them—is great, but it may be necessary to use an extension cone.

Almost every photographer has had some occasion to make for himself an extension cone, and has succeeded after a fashion and after a good deal of cutting and trying.

The following method may help some one to make an accurate cone next time without trouble.



A Axis. B Base. C Top of cone. D Side lines. E Meeting point.

Returning to the diagram, measure the distance from the top of the cone to the meeting point of the side lines; then transfer this measurement to the central line on the board beginning at the supposed top of the cone.

To begin with, do not make the cone of the same diameter at its small end as the lens tube, but considerably larger, and as large at the big end as the front board will permit. You will appreciate the advantage of this in use.

Then, knowing the desired diameter at each end and the length, proceed to draw on any suitable surface a straight line to represent the axis of the cone; go on and draw a diagram, actual size, showing the length and the diameter at each end. Having done this, continue the side lines of the cone until they meet at a point on the axial line. [This diagram may be drawn on the press board which is to be cut for the cone, but to avoid a confusion of lines it is described as being done elsewhere.]

Put a tack through each corner of the sheet to hold it flat and unmovable; then draw a central line across the sheet, extending the line considerably beyond the top edge of the sheet. Now mark the length of the cone on this line within the borders of the sheet.

Now set one point of a divider on the meeting point, and the other at the top mark of the cone, and swing an arc of the circle across the sheet; extend the leg of the divider, and swing another arc in the same way, touching the base mark.

There may be considerable lap, but the more the better with press board. If it is desired to cut and lap exactly, it can be done by multiplying the diameter of the large end by 3.1416, and adding for lap which gives the circumference of that end. Mark this on the line indicating the large end, and draw straight lines from these points to the meeting point; also a third line in a similar manner to show the lap.

The figure which is now outlined on the press board will, when cut out and properly rolled up, form the desired cone perfectly, having ends at right angles to the axis.

By placing a broomstick across two chair-backs, and working the board over it with the hands, it can be curled into form very easily; then, after drawing a mark by the edge of the over-lap, the under-lap may be glued, and the whole wound with string, and stuffed with soft paper to keep the edges together until dry.

For lining the cone with velvet the same directions will apply, except that heavy draughting paper is to be used, and, after being cut and the lap marked off, one side is coated with glue, excepting the lap; the velvet is then carefully pressed into contact, beginning at the centre of the glued surface, after which the whole is wrapped (velvet inside) about the cone for which it is intended, and then well fastened with string or rubber bands.

When the glue has dried, the free edges of the velvet are to be neatly trimmed off; then the lap can be glued and the whole pushed tightly into the cone; a stuffing of soft paper can be put inside if necessary.

Velvet forms a very good non-reflecting surface, but its efficacy can be considerably increased in this instance by winding an open spiral of hard cord about the cone before placing the freshly-glued lining upon it to dry. This will form fine corrugations in the pile of the velvet, and, if well done, will reduce the reflecting surface by one-half at least.

If the measurements have been carefully made and the subsequent operations properly done, no fitting or cutting will be needed after the glue is dry and the wrappings are removed.—*Photographic Times*.

#### IDENTIFICATION BY PHOTOGRAPH.

A CHAT WITH A DETECTIVE SERGEANT.

THE Sergeant was not very easy to draw out. He was guarded in his replies, and volunteered no statements. It was only under the genial and mollifying influence of "special" Scotch that he thawed, and began to show an inclination to gossip about his experience.

"Well, sir, to tell you the truth, the prison photographs we get to identify a man who's 'wanted' aint much good to us. Lord, the odd things we have sent to us!—you'd die of laughing to look at 'em. Fellows with their arms and legs stretched out with a warder holding each of his limbs, and he a-making the most horrible faces. That's the kind of portrait we have very often, and of course it's not a bit of good."

"Then what do you do if you have nothing to guide you?"

"Well, of course it's a bit difficult. If we can only get hold of one of our men who's seen the fellow—say in the dock at the police-court, or at the Old Bailey—why it's a great help, because half a look at a face is better than all the photographs."



"Yes, but supposing the policeman who has seen the man is not employed on the particular 'job,' how can he help you?"

"Oh, he gives us a sort of description—says he's like So-and-so, perhaps with a difference, and he tells us what the difference is. Then, if we've got one of these bad photographs as well, we can piece out what he's like. But there's no mistake about it—the photos ought to be better. We've complained over and over again, but it's no use. You see it's like this. A man's taken up to a chair. 'Sit down,' shouts out the warder. Well, he knows in a moment what's going to be done, and so up goes one eye, or he screws up his mouth, and ten to one if you can recognise him."

"Then they don't use instantaneous photography in the prisons, and take the prisoners without their knowledge."

"Well, sir, I don't know much about photography, but if that could be done it would be the very thing. And I tell you what also would be a great assistance as well: photograph the hands. Very often a man will have a mark—say a scar—or he may have lost the top point of a finger or what not, and that helps identification wonderfully."

"But note is always taken of those defects, is it not?"

"Yes, that's true, but somehow, when you have once seen the thing, it sticks in the memory. Besides, although it's easy to say, perhaps, that a man's lost the top joint of his fore fingers, it isn't so easy to describe the exact shape of a scar. I remember getting hold of a man, one of the 'Long Firm,' as full of tricks as a monkey, entirely through some tattoo marks on the back of his right hand."

"From the description?"

"Not exactly. You'd never have known it from the description. It was an odd shape, just as if the tattoo-er had stopped halfway in his design, whatever it was. I'd had one of those comic photos sent to me that I told you of. The chap had got two heads, and such a grimace on as you never saw. One of his hands was all a blur, but the other had been held as steady as a rock by the prison warder. It was the back of the hand that was turned towards you, and there was this tattoo mark. When I saw the chap I suspected, I should no more have known him for the man in the photo, than I should for the man in the moon. It was in a public house I spotted him, and while he was holding up the glass I caught sight of this odd-looking shapeless tattoo mark. It was enough for me. I saw I'd got the right fellow, and nabbed him."

"On the whole, you don't seem much impressed with the value of photographs."

"Not very much. I tell you what would be useful—if the regular thief could be photographed as he stands in the dock, and his portrait published in a paper for circulation among the police. There wouldn't be many escape us then, I'll warrant; that is, if the pictures were printed on decent paper."

"Which they wouldn't be, in all probability."

"I suppose not," remarked the sergeant; "that affair of Currell was a sad mess. If I had time I should like to do a bit of photography myself. I dare say I should find it useful. But what would be the use? I suppose the authorities would object."

With which philosophic reflection the interview came to an end.

## FRENCH INSURANCE COMPANIES.

### EXTRAORDINARY PRINCIPLES OF ASSESSING DAMAGES IN CASE OF FIRE.

*Galigiani*, of the 16th inst., has an article which may be of interest, as bearing on insurance of photographic goods; and moreover, informs the world that "dry gela-

tine plates" were introduced in France by "Professor Stebbing."

An action, which came before the 6th Tribunal yesterday, affords an insight into the manner in which French Fire Insurance Companies conduct their business.

Professor Stebbing was the introducer into France of "dry gelatine plates" for photographers in 1865. Like every other "innovation" in this country of civilisation, the invention took some long time to become popular with the people whom it was destined to serve, viz., the photographers.

However, in course of time, and by dint of perseverance and sacrifice, M. Stebbing's products came to be recognised as the best obtainable.

After several commercial transitions, such as taking unsuitable partners into his business, &c., M. Stebbing found himself in 1887 at the head of a most flourishing and profitable business. His house effects and factory in the Rue des Appenins were insured for 76,000 francs with the Company La Foncière.

On the 22nd of January the whole was destroyed by fire. M. Stebbing, from the excitement and fear of ruin of his business, had an illness which confined him to bed for some time. During his illness the Insurance Company virtually took possession of the premises, sent experts, &c., and finished by stating that there was only 32,000 francs worth of goods destroyed.

How they arrived at this calculation is, of course, best known to themselves. They offered that sum. It was "take it or leave it."

M. Stebbing refused. A fresh expert was named, who reduced the value of the lost property to 28,000 francs. M. Stebbing objected more than ever, and was told to go to law. "You had better have accepted our first offer," said the Insurance Company. M. Stebbing was obdurate. He argued, as any insurer with a respectable company would argue: "I declared the value of my property at so much. The insurance company sent inspectors to visit my premises, and on their report accepted my risk. They received the premiums upon the amount insured for years, and the day that I have the misfortune to have a fire they pretend to find by the ashes left of my property that I had not so much value. Why then did they accept my premiums? and that after having valued (or pretended to value) my stock and furniture in order to assess the risk."

After four successive adjournments occasioned by the crowded state of the rolls of the Court, the case came on for hearing yesterday in the Sixth Chamber of the Civil Tribunal.

M. Durier, Mr. Stebbing's advocate, stated the foregoing facts, while a clever young barrister employed by the company (La Foncière), went into all sorts of irrelevant details, such as a statement that "because M. Stebbing only had 11,000 francs owing to him by his customers at the time of the fire, he could not have had the amount of stock he stated."

After such a clinching (!) argument the President adjourned the case for a week to give judgment.

There are some striking features in this case which should cause insurers to reflect.

French insurance companies always deduct a percentage for deterioration from the value of goods insured. If you have paid a premium for ten years upon a table that cost you £40, and it is burnt during the eleventh year, they say it is not worth so much as when you bought it, "because it has been used for ten years." They overlook the fact that to replace it you must pay as much as before.

In the case under consideration they carried their principle to an excess. Amongst other things burnt were photographic apparatus—quite new, not even unpacked. The invoices showed their cost at 1,000fr. each a few days previous to the fire. Bought wholesale, to sell retail, they ought certainly to have been worth more than the cost price to the dealer. Nevertheless, the insurance company deducted 35 per cent. for deterioration in value.

But the beautiful stupidity of their system was more fully exemplified by the fact that there was a quantity of nitrate of silver bought at 90fr. the kilo, some time before the fire. At the time of the disaster the market value of nitrate of silver was 120fr. "Never mind," said the insurance expert, "there is a deterioration of 35 per cent. in value!"

Any remarks on such reasoning would be superfluous. The only moral to be drawn is, if you insure with French insurance companies, make your policy agree with the terms of an English or American fire insurance company. If the French company will not agree to your conditions refrain from insuring with it. There are, of course, respectable French companies, but they



are so eaten up with routine that they rob the public without either knowledge (?) or intention. It is for the public to object, or, better still, not to insure with them. There are plenty of respectable English and American companies having offices or agencies here, who, when once they have accepted a risk, will pay the sum insured.

### TONING OF SILVER PRINTS.

BY EDWARD J. LOVEJOY.\*

As a preliminary to toning, I may mention that the colour of the print is much influenced by the character of the negative; also, that unless you get a good negative—that is, one having a wide range of tones—you cannot get a good silver print.

Allowing that your negative is all that can be desired (and after printing somewhat deeper than the finished print is required to be, in order to allow for loss in the subsequent operations) the print is removed from the printing frame, trimmed, and put into a dish of water to dissolve out all the free silver, frequently changing the water till it no longer shows signs of milkiness; then place it into another dish of water, in which a little common salt has been previously dissolved; this converts any remaining free nitrate of silver into chloride, which is afterwards dissolved out of the film in the fixing bath. I believe the salt bath to be very essential, and for this reason it causes the prints to take a little longer to tone, by which they get a much finer deposit of gold on their surface, which adds to their permanency. After the print has been in the salt bath a few minutes it is rinsed again in water and is ready for toning.

There are several kinds of toning baths, with nearly all of which excellent results can be obtained. I will here, however, give you the formulæ for two only, both of which I use myself, and get very good results:—

Chloride of gold	...	...	...	1 grain
Acetate of soda	...	...	...	20 grains
Water	...	...	...	8 ounces

This should be made at least twelve hours before using. The other is:—

Chloride of gold	...	...	...	1 grain
Water	...	...	...	12 ounces
Borax	...	...	...	$\frac{1}{2}$ ounce

Sufficient bi-carbonate of soda should be put into the gold solution to neutralise any acid that may be in it. This bath may be used as soon as cold, for it is necessary to dissolve the borax in hot water, and when cold, add the gold to it. This is an important point. The gold must be added to the borax, and not the reverse. The print is now placed in the toning bath printed side down, and moved about to expel any air-bells which may have adhered to the under surface, and it is well to keep the solution in motion till toning is completed, as, where there are a number of prints in the bath, it causes the gold to deposit equally on all. The print should remain in the bath till of a fine purple tone, which usually takes from twelve to fifteen minutes, and I recommend the bath to be used at a temperature of about 70° Fah. The print is then taken out, and placed in a solution composed of methylated spirit four parts, water one part; this will prevent blisters from appearing on the print, which is a source of great trouble, and very prolific with some brands of ready sensitized paper; it is then put into the fixing bath, made of

Hyposulphite of soda	...	...	...	2 oz.
Water	...	...	...	20 ozs.
Liquor ammonia	...	...	...	15 drops

Fixation will be complete in fifteen or twenty minutes, when it should be taken out and washed in repeated changes of water, in each of which it should remain five minutes, and between each change it should be laid upon a piece of plain clean glass, face down, and a squeegee passed over the back. This is a very effectual way of removing the hypo out of the print. Then wash in running water for several hours.

### Patent Intelligence.

#### Applications for Letters Patent.

2207. FREDERIC LOUIS PERBEN, 34, Southampton Buildings, London, W.C., for "Improvements in lighting apparatus for magic-lanterns."—14th February, 1888.

\* Read before the Derby Photographic Association.

2360. WILLIAM McELROY and THOMAS PARSONS WATSON, 53, Chancery Lane, London, for "Improvements in exposure shutters for photographic purposes."—16th February, 1888.

Patent on which the Fifth Year's Renewal Fee has been Paid.

843, of 1882. T. SAMUELS, "Holding dry plates, &c., in photographing."

Patent on which the Eighth Year's Renewal Fee has been Paid.

1117, of 1880. W. WILLIS, junr., "Photo-chemical printing."

#### Specifications Published.

9,948. THOMAS PARSONS WATSON, of 313, High Holborn, London, Optician, for "An improved spring fastening for the shutters of dark slides of photographic cameras."—Dated July 15, 1887.

The claim is:—

1. A spring latch fastening for photographic dark shutters, consisting of a single spring strip of metal having a nib turned up along one edge at about right angles thereto, the spring strip being applied along the handle of the shutter, and being adapted to be engaged and disengaged by flexure of the spring in the direction of its length, in combination with a fixed catch in the end of the frame, with which the nib is adapted to engage, substantially as specified.

2. A spring latch fastening for photographic dark shutters, consisting of a metal strip having an outwardly turned forked nib near the middle thereof, secured along the handle over a cavity therein, as described, in combination with a round-headed screw pin fixed in the end of the frame for engagement with the forked nib, as specified.

3. A spring latch fastening for photographic dark shutters, the spring or movable portion of which is wholly external, that is to say, is applied only to the projecting portion of the shutter, substantially as herein specified.

4. A spring latch fastening for photographic dark shutters applied to the projecting portion or handle of the shutter, and having a nib adapted to engage with a fixed catch projecting from the end of the frame.

3,922. JOHN RUDOLPH GOTZ, Optician, of 19, Buckingham Street, in the City of Westminster, for "Improvements in instantaneous shutters."—Dated 15th March, 1887.

The claim is—

1. In instantaneous shutters containing a spiral spring and a reciprocating slide adapted to be set in motion by the said spring, the combination of a supporting frame and guide with a spiral spring, a spring barrel, and balanced crank disc, a circular rolling slide, a connecting rod connecting the crank disc directly with the axle of the said slide, a locking apparatus, and a pneumatic releasing apparatus adapted to act on the locking apparatus.

2. In an instantaneous spiral spring shutter, substantially as described, a bow spring secured at its ends and bent near the middle of its length, and having a concave surface adapted to act as a brake on the circumference of the crank disc, substantially as described.

3. In an instantaneous spiral-spring shutter, an automatic spring-brake, adapted to produce frictional contact, and thereby to retard the motion of the crank-disc or spring barrel shortly before reaching its position of rest, substantially as described.

4. In an instantaneous spiral-spring shutter, an auxiliary brake adapted to act on the axle of the spring barrel.

5. In an instantaneous spiral-spring shutter, a star wheel or tooth wheel, or equivalent device adapted to indicate and limit the number of turns of the spiral spring, substantially as described.

6. In an instantaneous spiral-spring shutter, having a spring barrel, crank disc, and locking apparatus adapted to operate substantially as described, a time lever and accessories revolving with the crank disc, and adapted to stop the same after having made half a revolution, substantially as described.

7. In an instantaneous spiral-spring shutter, the pneumatic locking and releasing apparatus, comprising locking lever, spring, lifting lever, air cylinder, with piston, piston rod, and guide post, and air tube with elastic ball, substantially as described.



## Correspondence.

## ORTHOCHROMATIC PHOTOGRAPHY.

DEAR SIR,—I should not have troubled you regarding this subject again at present, but I am afraid I must ask you to insert a short reply to Dr. Vogel's letter, which appears in your last issue, as he has fallen into several—no doubt, unintentional—inaccuracies. I will deal seriatim with his statements.

In the 2nd paragraph Dr. Vogel says, "Captain Abney don't read German; he is not in condition to know the scientific ideas which rule in Germany, &c." Allow me to say that I can and do read scientific German literature, having gone through the pain of studying the language at home and abroad for the very purpose.

At the end of the 2nd paragraph he says I cite a sentence of one of his letters, "written, perhaps, ten years ago." The sentence I quoted is in his letter which appeared in the NEWS of the 27th January, 1888, and to which my last letter was a rejoinder.

The 3rd paragraph in the quotation I made from that letter.

The fourth paragraph is as follows:—"This says (so continues Mr. Abney) in other words, that to deprive a ray of part of its energy enables it to do more work." Apparently (taking the context of the next paragraph) Dr. Vogel thinks these are my own opinions. He will see, on re-reading my previous letter, that they are merely a paraphrase of his own words in the 3rd paragraph.

In answer to his next paragraph, I may say that I have not forgotten the principle of the "conservation of energy," the demonstration of which was not first made, by-the-bye, by Meyer (Mayer probably is intended) nor Helmholtz, but by Joule. It was on the grounds of this very principle that I cannot accept Dr. Vogel's theory as I understand it. If a certain amount of the energy of a ray has been expended on a dye, either in the production of heat or chemical action (which is shown by its absorption by the dye), there is less energy left after its passage through the dye to act upon the silver salt. The emasculated ray would only act upon it if the salt of silver was sensitive to that ray. It would be equally logical to place a dyed film as an "optical sensitizer" in front of the spectroscope, and expect the silver salt to be more acted upon by that part of the spectrum in which the absorption by the dye took place, than when the film was not there. If it is necessary for the dye to be in molecular contact with the silver salt, then the explanations I have offered are sufficient. I have never called in question the facts of the case; all I have demurred to is their explanation as propounded by Dr. Vogel. He says, "These facts are that certain dyes mixed with silver salts make sensitive the silver salts only for those rays optically absorbed by those dyes." This is a summation of facts which must be received with reservation. When dyes are combined with silver compounds the absorption by the compound is not necessarily the same as that by the dye, but it may be acted upon chemically. When the dye is fugitive, and does not combine with the silver salt, it is the dye which is sensitive, and not necessarily the silver salt at all, the reduction of the silver salt being a secondary action, as I long ago pointed out. My explanation is essentially based on the connection between absorption and chemical action, and on no other. In his opening paragraph, he says that I repeat my old objections against his theory without convincing him at all. I did not expect I should convince him.

I regret to differ from Dr. Vogel, but it cannot be helped. It may turn out that our difference is only one in name, and that we, in reality, mean the same thing. Perhaps when my knowledge of German is greater, and his of English more perfect, we may arrive at that conclusion.—Yours faithfully,

W. DE W. ABNEY.

## ORTHOCHROMATIC PHOTOGRAPHY.

DEAR SIR,—Messrs. Edwards and Co. have now dropped the points originally at issue, and their letter in the NEWS of the 17th inst. is mainly a series of personal imputations against myself, notwithstanding their alleged wish not to introduce personal matter. The following facts will enable your readers to form their own opinions as to Messrs. Edwards and Co.'s notions of accuracy and fairness.

The reference in their previous letter to some imaginary experiments of mine with dyed films of plain gelatine is now supposed to be supported by a quotation from p. 147, and I am alleged to have apparently given this statement as the result of my own investigations whilst I was really appropriating the work of others. Now, sir, the sentence quoted, as indeed is obvious from the sentence itself, does not refer to a photographic experiment at all. It occurs in a general account of the various methods of examining absorption spectra; there is not a single indication that I had made any observations myself in this particular way, and in the sentence immediately preceding there is a reference to one of the original papers in which Vogel pointed out some of the reasons for adopting this particular method! Moreover, much further on in my articles you will find this sentence, p. 539, "Hitherto the author has dealt mainly with the experiments and results of others."

Again, I have "annexed Tailfer's bath process, or a bad copy of it, . . . without a word of acknowledgment to the original inventor." In the first place, I have never done anything so absurd as to claim bath processes as in any way an invention of my own, and in the first part of my articles there is a long list of formulae for bath processes recommended by previous workers. Moreover, any one can see that the proportions which I used differ but little from the proportions in Mallman and Scolik's formula published in 1886 (p. 212), the variation being made in the first instance to simplify measurements, and retained because the plates were found to be somewhat less liable to fog. I have previously quoted the patent more than once, but here is Tailfer's description of the bath process:—"When gelatino-bromide plates already prepared are available, it is sufficient to pour over the dry film the ammoniacal solution of eosine to which alcohol is added. The plate is then washed without fear of the removal of the eosine, which becomes immediately associated with the gelatino-bromide." There is not another word of description of a bath process in the specification. How much eosine? How much ammonia? How much alcohol? I leave your readers to judge how far the various bath processes can fairly be called copies of a vague general instruction like this, except of course that they involve the use of an eosin dye mixed with ammonia.

Then I make no acknowledgment to Tailfer. I quote the patent (p. 708); I say (p. 707):—"This patent is of considerable interest, since it was the direct outcome of the first successful application of dyes to gelatine plates for the purpose of rendering them sensitive to the less refrangible rays." See also *Journal of the Society of Chemical Industry*, 1887, p. 424. Doubtless Messrs. B. J. Edwards and Co. would not be satisfied unless one stated that the process as described by Tailfer is perfect, and represents finality in orthochromatic photography.

Further, it is said that Mr. Bothamley again attempts to throw dust in the eyes of your readers by referring to the bath process used by him as distinct from Tailfer's patented process. Now in my last letter (Jan. 20th) there is not a single reference to any relation between or difference between the bath process which I used, and the Tailfer bath process. I have never said that the bath processes, involving the use of eosins and ammonia, were not covered by the Tailfer specification, but the formulae given by myself and others certainly specify definite quantities which are not specified in the patent.

Then they demand a public acknowledgment that the



bath process I used is an infringement of the Tailfer patent. Is not this somewhat absurd? Here is a specification covering the application of eosin dyes to gelatine plates in conjunction with an alkali, and here is a formula for treating plates with a solution of an eosindye made alkaline with ammonia! I do not think I have written a single article on this subject without calling attention to the patent. See, for example, YEAR-BOOK 1888, p. 48:—"The application of the eosin dyes in conjunction with an alkali to gelatine plates" is the subject of patent No. 101,\* 1883, and also *Photographer's World*, 1887, p. 198:—"Erythrosin is one of the eosin dyes, the use of which, in conjunction with an alkali, is protected by Patent 101, 1883."

Lastly, I am "evidently not aware" of the extent of the unpublished researches of "Tailfer and Clayton in France, and others (including ourselves)." I am inclined to think that there is nothing unusual in a want of knowledge of things which have never been published. I am quite sure that unpublished experiments and results do not add anything to the stock of general knowledge of a subject. We are also favoured with an opinion as to the extent and value of these unpublished experiments, a point on which Messrs. Edwards and Co. are, of course, impartial judges.

I trust photographers will be properly grateful to Messrs. Edwards and Co. for their anxiety that my statements should not go uncontradicted. The reason for that anxiety is, perhaps, not far to seek. The value of their contradictions is, however, not self-evident.—Yours truly,

C. H. BOTHAMLEY.

Feb. 18th, 1888.

#### THE AMATEUR PHOTOGRAPHIC CHARITY ASSOCIATION.

SIR,—In the last week's issue of the PHOTOGRAPHIC NEWS, I notice a letter from Mr. William Adcock, in which he strongly condemns the present movement amongst amateurs for benefiting charities by the proceeds of their work. In this matter there is not the slightest intention, nor in my opinion any likelihood, of such a movement infringing in any way on the interests of professional photographers.

Would it do so, the idea of founding the charity association would never have been mooted, as every amateur must gratefully acknowledge the useful hints and the many valuable services always so cheerfully rendered to them by the professional brethren.

Mr. Adcock, in his letter, gives a very graphic description of the vested interests, dependants, and general liabilities of the profession, which I acknowledge, and agree with him that in these times of bad trade and keen competition the life of the man whose calling is to produce pure luxuries cannot be "a happy one." After his description, there follows, in my opinion, a most erroneous assertion and idea when he says: "Lord Grosvenor suggests that amateurs shall work for money, and that they take portraits of friends for money, &c." Well, if Mr. Adcock thinks the majority of amateurs, with their landscape lens, no accessories, little spare time, and less practice, can turn out portraits that will compete with a professional, who has usually every modern appliance, great skill, practice often of a lifetime, well then I think either the amateurs should feel highly flattered by Mr. Adcock's tribute to their work, or a great deal of professional work must be awful rubbish. We know how every amateur aspires to portraiture on his commencing photography, and we also know how soon he is happy to give it up for landscape or other more purely amateur work. His friendly sitter would never be sufficiently satisfied to pay for results which cannot compare with highly-finished retouched professional work. Let me take, out of many others, just three illustrations where myself,

an amateur, might have earned money for a good cause without any possibility of taking the bread out of any professional's mouth, and these are the samples of the instances, and not portraiture, from which the Amateur Charitable Association hopes to derive its funds.

Last summer a friend, who had a favourite collie dog grown old, feeble, and near the end of its career, asked me to photograph the animal, which I did. Again, a lady friend, interested in a bazaar, asked me for a few photographs towards same; I printed a dozen from landscape negatives, which sold readily at two shillings each. Lastly, an acquaintance having built a house, and being naturally proud of the edifice, begged me to produce for him a photograph of same; it was done, and gave him great pleasure. Now, in these three cases, the professional man would never have been called in—it was only the knowledge of my dabbling in photography that created the demand.

Had I said to my two friends, "Well, I shall be happy to photograph your dog, your house, or print some for your bazaar, but I am interested in a charitable association, and wish to make my art not only a pleasure to myself, but the means of doing good to the sick and poor, therefore I will do my best; but you in return must give me just what you consider the pictures are worth," the result would have been ten to fifteen shillings cheerfully given.

It would also have produced a feeling in the amateur that he must turn out good work, the recipient would not be under the obligation he now feels he is, and the professional would not be one iota the worse for the contributions having been given. Multiply the above cases and the above sum of money by thousands, and, Mr Editor, you will have some idea of what amount of money amateurs can raise for charitable purposes if they join the association about to be started.

Let me respectfully suggest to Mr. Adcock that the breakers ahead he sees are purely imaginary, and assure him that he never need fear the professional income ever being encroached upon because of the existence of the Amateur Photographic Association.

What justice would there be in robbing one portion of the community to benefit another?—I am, yours truly,

ALFRED CONSTANTINE.

Oakfield, Somerset Road, Handsworth Wood, Feb. 19.

#### Proceedings of Societies.

##### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE usual weekly meeting was held on the 16th inst., A. HADDON in the chair.

"Photomicrography, with Medium and High Powers," was the subject of a discourse by A. PRINGLE. Commencing with his indebtedness to Dr Maddox, the Lecturer proceeded to describe the apparatus. Different systems had been employed by able and good authorities. He would, however, only describe the method he had adopted. This consisted of camera and microscope attached; the latter instrument being mounted on a turntable, thereby admitting of an object being examined with the microscope detached. The optical system was next referred to. For bacteria work he used an oil immersion lens and the new lenses that had recently come into the market. Of these objectives he could speak in unqualified praise. In connection with these powers an achromatic sub-stage condenser was necessary—after being accurately centred with a lower power. This part of the optical system the lecturer considered the least understood as a rule. The use of the eyepiece was still a debatable point. As to the question whether an image should be taken on a small size plate and enlarged afterwards, or taken direct the size required, was a matter of convenience. Excellent enlargements could be made from small negatives taken with low powers. The plates he had used were what would be called slow; but recently he had made an emulsion for the purpose which gave excellent results. Amplification he had not found satisfactory if 850 diameters were exceeded. Focussing was

\* The printer has made this 107.



effected by a brass rod, acting by means of a band upon the fine adjustment screws. One of the difficulties of photomicrography was the nature of the object when prepared and mounted other than for this special purpose, leading to great waste of time, and frequently temper, on the part of the inexperienced operator. As to the amount of exposure to be given to an object, the lecturer said no absolute rule could be given on this point. Flat images with high powers were by no means rare, and it was not until after some little practice that he could determine whether this arose from over or under exposure. An image that came up without forcing had, in his opinion, received a normal exposure. In printing he preferred, for negatives taken with low power, using glazed paper; but with those taken with high powers, a bromide paper gave the best result, using a strong developer, and giving a short exposure.

J. TRAIL TAYLOR asked if the lecturer had tried sunlight as a source of illumination.

L. ATKINSON asked if it was necessary for the sub-stage condenser to be the same numerical aperture as the objective employed.

H. TRINKS had used several illuminants, but had come back to an oil lamp as being the most simple, and much more under control. He considered the whole question of illumination had been thoroughly expounded in a paper read before the Royal Microscopical Society by F. Crisp in 1885. He could speak from practical experience of the high qualities possessed by the new projecting eyepieces; he was able to resolve and photograph *amphipteura pellucida* without the least difficulty.

J. J. BRIGINS showed some lentilles mounted on platinum wire, which, being rendered incandescent with oxyhydrogen gas, formed an excellent illuminant for this class of work. He believed it only required to be known to be more generally adopted. His method of bringing the sub-stage condenser into the optical axis was by focussing with a low power two micrometer lines drawn on the front lens of the condenser. He asked what method the lecturer adopted in measuring the amplification of the object, and the screen he employed.

The CHAIRMAN remarked that the lecturer had stated his preference for a collodion emulsion in consequence of its fine state of division. In his (the Chairman's) opinion, a slow gelatine emulsion would be more finely divided than collodion.

A. PRINGLE, in reply, said, with regard to sunlight, if he had been inclined to try this method of illumination, it would not have been an easy matter, as so little had been seen the last few months. As to the sub-stage condenser, it should be suitable for the special class of work for which it was employed. He had used lentilles with oxyhydrogen as a luminant with success. In measuring the amplification of objects, he focussed a micrometer slide on the screen, and then measured the image with a pair of compasses. This could not be considered a very exact way, as the micrometer lines were thickened on the screen. However, an approximate measurement was effected by taking the centre of the lines. For a screen he used a piece of plate glass with lines ruled across. He was, however, after some little experience, enabled to determine the exact focus, when using an oil immersion, by the fringes of colour on the screen. This would not, of course, hold good with an achromatic lens. All his lenses had been selected for photo-micrographic work, and he had found them admirably suited to that class of work. A series of slides from negatives taken by the lecturer of bacteria bacilli, micrococci, septicaemia, and spirilla (the latter with flagella), were then projected on the screen.

A hearty vote of thanks proposed to A. Pringle by the Chairman for his interesting lecture was unanimously voted.

#### CAMERA CLUB.

On Thursday, February 16th, the subject under discussion was "Negative Films." Lieut.-Col. Verney presided, and opened the proceedings by describing his experience of the new Froedman film. He then called on Mr. Vergara, of the Vergara Film Company, who gave an outline of the manufacture of this gelatine film, and of the manipulations required in actual practice. Mr. Vergara also exhibited specimens of his slide specially adapted for use with the films, and specimens of ingenious carriers invented by Mr. Samuels.

Mr. DAVISON gave some further details of Vergara film, and referred to the Eastman stripping films, examples of both processes being handed round.

Mr. PUMPHREY contributed an interesting history of his experiments with films for many years past, and then demonstrated

the procedure required with his latest lifting film. Excellent negatives and prints were handed round.

J. SHEW also exhibited an unexposed specimen of the Balaguy film.

H. FRY described a new film about to be introduced by Fry and Co., which would be exposed and developed in attachment to a paper support. The film when wet could not be detached from the paper, but it would peel off almost of its own accord as soon as dry. To dry the film after development it need only be suspended by a clip or laid on a sheet of blotting paper, no pressure being required to prevent cockling.

The discussion was carried on by Messrs. Dresser, Lucas, Clark, and Ferrero.

The subject for Thursday, March 1st, is "Home-made Sensitised Papers," to be opened by a communication from H. J. Gifford. Plain salted papers, the preparation of platinotype, &c., will be discussed. Meeting at 8 p.m.

#### NORTH SURREY PHOTOGRAPHIC SOCIETY.

The usual fortnightly meeting was held at the West Norwood Constitutional Club on Tuesday evening, February 14th, G. R. FLUDDER in the chair.

Mr. Wilkinson was elected a member of the Society, and R. Norton and F. W. Chambers were proposed for election.

The Hon. Secretary (H. SENIER) read a short paper on the "Solubility of Light-altered Silver Salts in Hyposulphite of Soda." The communication had special reference to the possibility of fixing negatives in actinic light, upon which a discussion had been raised at a former meeting. Mr. Senier first showed that light-altered silver salts were not altered as regards their solubility in hyposulphite of soda, and then passed round some bromide and chloride plates upon which experiments in this direction had been made. One of these plates was an ordinary Ilford which, for over twelve months, had been constantly exposed to daylight, but which was thoroughly fixed by an immersion of ten minutes in the usual hypo bath. After well washing, this plate was immersed in a bath of sulphhydrate of ammonia to discover if any silver was left in the film, but none could be detected. A chloride plate treated in the same manner gave a similar result.

H. SENIER next showed a transparency which, after development and washing, had been exposed for two hours to full sunshine, and then half of it put into the hypo bath, the result being that it fixed as quickly and as well as if it had never left the dark room. Mr. Senier concluded by pointing out that it was quite practical to fix negatives in open daylight so long as the developer was quite removed by very thorough washing. At the next meeting of the Society on Feb. 28th Mr. Acworth will give a demonstration of Alpha paper. Visitors are invited.

#### MANCHESTER AMATEUR PHOTOGRAPHIC SOCIETY.

On Tuesday the above Society held a soirée and exhibition of photographs in the Lecture Hall of the Athenæum. There was a crowded attendance of members and friends, who were entertained at intervals with music, and also with a lantern exhibition, in which a number of slides were thrown on a white screen, illustrating scenes taken by members chiefly during their summer rambles, the manipulator of the lantern being J. G. Jones. On the walls and tables round the room there was a display of sketches by members, comprising landscape, architecture, and portraits, many of them being quite equal to the work of professionals.

The chair was taken by the President of the Society, the Rev. H. J. Palmer, M.A., who delivered a brief address. He said it seemed only the other day that they launched their society in the midst of several other societies in this city, yet such had been its progress that it now numbered 240 members, being an increase of ninety during the past year. It now ranked almost first among the amateur societies of Great Britain in number, and he thought from what they saw upon the walls the company would agree with him that it was certainly among the first in the excellence of the work which its members produced.

During the evening ten new members were elected.

Over 1,000 prints and transparencies were exhibited on the tables and walls; and 170 lantern slides were shown on the screen by J. G. Jones.

#### DERBY PHOTOGRAPHIC SOCIETY.

This Society held its usual monthly meeting on Tuesday, Feb. 14th, at their rooms, 33, Victoria Street, RICHARD KEENE presiding.



C. J. LOVEJOY (Hon. Sec.) read a paper on "Toning of Silver Prints" (see page 124), which was well received, and elicited discussion.

It was decided that there should be a competition for the best set of four negatives taken at the outdoor excursions this season, the first being fixed for Saturday, April 28th, at Duffield.

At the March meeting, Ismail Sabry will read a paper on "Photographic Experiences in Belgium."

#### CARDIFF AMATEUR PHOTOGRAPHIC SOCIETY.

THE customary fortnightly gathering of this Society took place on Tuesday, at the Lecture Theatre attached to the University College, kindly granted for the occasion by the Principal. Professor KER occupied the chair, and introduced the lecturer for the evening—

C. HENRY JAMES, who gave an interesting description of a holiday spent in Norway accompanied by the camera. The lecture was photographically illustrated by electric light, and depicted the characteristics of the people, formation of the country, &c. The lantern was manipulated by Messrs Harrison and Davies.

### Talk in the Studio.

PHOTOGRAPHIC SECTION OF THE EXHIBITION AT GLASGOW.—Our readers should remember that the exhibition will be opened in May, 1888, and the following are the more important of the regulations. It will comprise illustrations of photography, under the following heads:—(a); portraiture, landscape, photographs, architecture. (b); reproductions of pictures, drawings, etchings, and engravings. (c); photo-lithographs, photogravures, phototype, photo-blockprinting. (d); illustrations of books. (e); transparencies and enamels. Pictures sent must be framed, and must be delivered (carriage paid) at the Exhibition Buildings, Kelvingrove Park, Glasgow, during the week ending the 24th March, but any convenient number of photographs may be mounted in a single frame. Oxford frames will not be accepted, and at the back of each frame must be written the name and address of the exhibitor, the title of the picture, the process by which it is produced, and (if for sale) the price. This information must be repeated on a label attached by a string to the top of the frame, so as to hang over in front. An advice form, filled in with the name and address of the artist in full, the titles of the works, and their prices (if for sale), must accompany all works sent in. Labels and advice forms will be supplied on application to the secretary of the Fine Arts Section, Robert Walker, 27, St. Vincent Place, Glasgow. *Note*.—Separate prospectuses, containing the regulations of the loan and sale sections and the archaeological sub-section may be had on application to the secretary as above.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The usual monthly technical meeting of this Society will take place on Tuesday next, February 28th, at 8 p.m., at 5A, Pall Mall East, when a short paper will be read, and a demonstration given of "Silver-Gold Printing by Development," by Howard Farmer, and H. K. Taupkin, B.Sc. Doors open at 7 p.m., for journals and conversation.

THE EFFECT OF LIGHT ON PLANTS.—The herbalists of old, after the experience of a life in collecting plants for their medicinal preparations, observed the peculiarities of these plants at different times of the day and night, and even under different phases of the moon. This was long looked upon as a superstitious craze—a remnant of alchemy and magic. The rules of these herbalists, however, deduced centuries ago after careful observation, are now being explained. Long were they laughed at as mere delusions, but Sachs, the highest authority on the physiology of plants, has demonstrated their truth. His observations show that the amount of starch present in the leaf of any given plant varies considerably under different circumstances. When the sun shines brightly and directly upon the plant, without much wind, starch is formed very rapidly. During the night, again, this starch generally disappears. Accordingly, leaves collected at sunset are full of starch, whereas the leaves of the same plant gathered at daybreak are quite destitute of it. Sachs has given us the best means of detecting the existence of starch in leaves. The leaf to be examined is first plunged into boiling water for about ten minutes, then taken out and digested in alcohol for

about the same time. The whole of the colouring matter is thus extracted, and the leaf is left quite white. If the leaf be now placed in an alcoholic solution of iodine, the existence of starch can be instantly detected. If much starch be present, the leaf turns blue-black; if the quantity of starch be but small, it becomes only brown; if there is no starch, no change occurs. The veins of the leaf form a pale network on a dark ground, rendering it a very beautiful object. Sachs has not yet succeeded in preserving one of these specimens of venation beyond a few hours. The variations in the amount of starch in the leaves of plants at different periods of the day and night arrest the observer's attention, for they render it possible that the amount of some of the poisonous alkaloids formed by the decomposition of albuminous substances may vary in a similar way. This is quite a new study. The influence of light on plants may yet prove of great practical importance in medical art.—*Scientific News*.

PHOTOGRAPHIC CLUB.—The meeting on February 29th will be a lantern night. Discussion on lantern matters. Visitors invited.

### To Correspondents.

\* \* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER AND CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

J. G. MARTIN.—Lamp black will answer very well, but it must be thoroughly ground with the jelly. About twenty grains to each pound is a convenient proportion.

JOHN E. FALKNER.—The papers we sent you are not likely to assist you in obtaining what we now understand you wish for; but do not trouble to send them back. We decline to assist or advise you further.

J. E. LANGFIELD.—We have posted your letter to Professor Bothamley.

OWEN WILLIAMS.—It is a solar microscope, and should be fastened over a hole in the shutter of a darkened room; the mirror being to reflect the solar rays through the instrument. It could be used as an attachment to the front of an optical lantern. Probably at a sale in London it would not fetch more than a sovereign or thirty shillings.

W. H. BANKS.—If you only desire local treatment the method you refer to is the best.

W. MORGAN.—Use the developer rather weaker—that is, diluted with water—in warm weather.

J. STORY DAVIS.—The work of registration is undertaken by the publishers of the PHOTOGRAPHIC NEWS, Piper and Carter, 5, FURNIVAL STREET, E.C., and for twopence they will send you a form with particulars. The Editorial department undertakes nothing of this kind.

W. MALBY.—We cannot inform you, but feel sure that it will come outside the ordinary regulations for the registration of photographs. Perhaps you had better consult a patent or registration agent.

A. W. C.—1. Perhaps five or six shillings the lesson of one hour. 2. We cannot tell why there was no reply.

C. COOPER.—1. You will find full particulars in the current issue of the YEAR-BOOK. 2. More water is required; indeed, the strength should seldom exceed 20 grains to the ounce.

SPOT.—It should not be used under any circumstances, and after the warning you have had, you deserve but scant sympathy.

T. BREADER.—It has been completely spoiled by damp, and we do not think it is worth while to have it put right. You had better buy a new one.

R. D. T.—You ought to know better than to suggest such an arrangement.

C. EDMONDS.—Write to the maker, Watson, of Holborn.

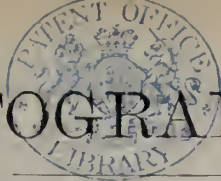
### Photographs Registered.

Mr F. W. BROADHEAD (55, Welford Road, Leicester)—Two photos. of the Duke of Rutland.

Mr. BATEMAN (Canterbury)—Six photos. of the remains of St. Thomas A'Beckett.

Mr. F. WHALEY (Lincoln)—Photo. entitled "Mother's Pride," photo entitled "The Finishing Touch."





# THE PHOTOGRAPHIC NEWS.

VOL. XXXII. No. 1539.—March 2, 1888.

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### EMERSON'S LATEST COLLECTION OF PHOTOGRAPHS.\*

EMERSON has so far the spirit of the free craftsman as to seek first to produce that which is excellent according to his own view—in other words, that the production of which gives him pleasure. He neither works for a master who dictates what is to be made, nor does he work with a view of attracting the patronage of a purchasing public; whether a public paying in cash or in medals.

By boldly taking up the position of absolute freedom from the constraint of masterdom or convention in any form, and striving to make his photographic productions approach his own ideal, as nearly as his technical skill and opportunities would allow, Emerson has experienced much the same as the free worker of great ability has generally experienced, whether that free worker be a constructor of something material, or a thinker: his work has been first spoken ill of, then tolerated, and afterwards admired; but all this time his skill has become greater, his opportunities have developed, and maybe his view of his ideal towards which he aims has somewhat altered. We may take it that his ideal is the representation of nature, and although nature as his ideal remains constant, the notion of the most perfect representation of nature must shift with a man's culture of the perceptive sense, and in his sense the ideal of the artist shifts or develops. The commercialist, on the other hand, has no ideal. He merely constructs that which he thinks will bring him the reward he desires, whether money, goods, or laudation: consequently he must study, not Nature, but the ever-shifting convention of taste among those who pay for what they and their friends are pleased to call works of art.

Several times we have criticised Emerson's work, and, indeed, not always in every respect favourably; but here we have to acknowledge the receipt of something really far better than the former excellent work sent us.

"At all seasons of the year is it beautiful," writes our author of the East Norfolk scenery, and we need go but a little further to see that he has the first element of success as a craftsman—love of his work; he then gives a poetic account, almost with the loving fervour of Virgil, of the beauties that he so much feels.

"The Skirt of the Village" is altogether a gem of a picture, not quite four and a-half inches square. It shows two village children looking into the battered reed hedge by the side of a dike, the pleasant village cottages being shown in the distance. Emerson has well handled his tools in keeping the maximum of sharpness for the principal figures.

"The Haysel," though much larger, pleases us much

\* "Idylls of the Norfolk Broads," being twelve autogravure plates from original negatives, together with descriptive text and introductory, by P. H. Emerson, B.A., M.B. (Cantab). Proof set on India paper No. 45. London, The Autotype Company, 74, New Oxford Street. Author's introductory, date April, 1887. Proof sets limited to one hundred and fifty copies. (Briefly noticed last week).

less; indeed, if about a third were cut off from the right-hand side, we think it would have made a more agreeable picture; but the next, No. 3, "Noontide on the Pastures," abundantly compensates for the slight reaction from No. 1 to No. 2. The richly plant-laden water-way, the bright grass land, the distant trees, and the grazing cattle, are delightfully pictured. An artist, having made such a picture by hand, might well be proud of it.

Smaller still—indeed, not quite three inches square—is the next, "Flowers of the Mere"; but we look on it as the very best in the collection. The text thus refers to it—a text which is a refreshingly excellent example of typographic printing on good (hand-made) paper:—"A charming little village maiden sits in her father's clumsy old marsh boat, amid the golden and white cups of the water-lilies. She has pushed her craft into a corner rich with blooms, and hidden from the broad by the green gladdon beds. Plucking the flowers, she binds them together with ribbons of light green gladdon, and, placing them carefully in her basket, will on the morrow take them to the Norwich Market and sell them."

"Autumn Floods" shows unmistakably as a photograph. In this, by virtue of a slight misuse or slip in the use of the tools, "the line of rush, crowned with their bursting seed cases," which breaks up and emphasizes the foreground, is far less sharp than the greater distance, which should not be the case, as after the first glance the eye rests on these rush plants. Our artist could not perhaps bring his mind to sacrifice so fine a picture, but he should have done so, even if he had to wait a year for making the fresh exposures which would have yielded the fruit of the whole labour. To do the best possible, one must be courageous in rejecting, and industrious in acting on each lesson.

We have no such fault to find with "The Sedge Harvest," a delightful piece of composition. "It is a beautiful sight to watch the slowly-gliding boat with its heavy load being laboriously pulled through the water ways by these stalwart oarsmen," says our author. His picture emphasizes his words.

Attractive indeed is the last of the series, "The Windmill," but one peculiarity of this is its excessive sharpness right through from foreground to distance; indeed, it almost invites us to take up a magnifier for further examination. Is this nature? may be asked, and does any human eye see all in front of it anything like so sharp at the same time? Dr. Emerson should be well qualified to answer this question. We would like to see the same view taken with a somewhat larger stop and the foreground focussed.

Altogether Dr. Emerson has in this last series done an excellent thing, and should the time come when photographers in general do similarly, artists will not speak of photography as they very often do at present.

The reproduction by the Autotype Company is such as to add to their existing high reputation.



# PHOTOGRAPHIC EXHIBITION AT THE CRYSTAL PALACE.

In commencing our second notice, we may mention that arrangements have been made to keep the show open till the 17th of the present month.

The awards already announced are numerous in proportion to the exhibitors, and the following is a list of the recipients:—

*Class A.*—Cameras and fittings: medal—H. Watson and Sons; certificates—Geo. Hare, J. R. Gotz. "Detective" cameras: medal—W. W. Rouch and Co.; certificates—R. and J. Beck, Scovill Manufacturing Co. (per the Eastman Dry Plate Co.). Appliances for paper and film photography: medal—the Eastman Dry Plate and Film Co. Tripods and studio stands: medal—W. Watson and Sons; certificate—W. Ford Stanley. Studio furniture: medal—Marion and Co.; certificate—Oscar Schölzig.

*Class B.*—Lenses: The awards in this section are not yet made. Instantaneous and time shutters: medal—J. H. Dallmeyer; certificate—Eidsforth and Mudford. Finders and view meters: No award. Enlarging apparatus: medal—George Houghton and Son; certificate—Noakes and Son. Lanterns: medal—Docwra; certificate—Noakes and Son; special medal—Awarded for automatic gas governor, Oakley and Co. Appliances for artificial illumination: medal—Marion and Co.; certificate—Mawson and Swan. Stereoscopes: No award.

*Class C.*—Cheap and popular sets: medal—Underwood and Co., per Mawson and Swan; certificate—Marion and Co.

*Class D.*—Dry plates and film: medal—Paget Prize Plate Co.; certificates of equal merit—Thomas and Co., Limited, and Beernaert and Co. (per J. Mothersill.)

*Class E.*—Mounts: medal—Marion and Co.; certificates—Kleffel and Co., and Woolff (per Oscar Schölzig) for novelty. Mouldings and frames: medal—Fede Butt and Son (for moulding); certificate—Couch and Co. (for frames). Albums and cases: medal—Marion and Co.; certificate—D. A. Lowthime.

*Class F.*—General appliances and plant: medal—Marion and Co.; certificate—Mawson and Swan; special medal—G. Houghton and Son (for portable dark-room); special certificates—Awarded to Photo-Artists' Association (for Marriott's Automatic Centrifugal Print Washer), James Swift and Son (for apparatus and microscopes arranged for photo-micrography), and W. Tylar, for general exhibit under this class.

*Class G.*—Cycles fitted for photographic purposes: medal—The Success Cycle Co.; certificate—Marriott and Cooper.

**PHOTOGRAPHS.**—*Class A.*—Green Brothers (pro.), medal; H. Collis Pettitt (pro.), Chas. Jacquin (pro.), Harry Pointier, certificates; Geo. Davison (ama.), medal (the silver medal presented by the *Amateur Photographer* is also awarded to this exhibitor); Carl Norman (pro.), medal; B. G. Wilkinson, jun. (ama.), certificate; Russell and Sons (pro.), certificate; Frith and Co. (pro.), medal; J. B. Hilditch (ama.), medal; C. Cheald (pro.), certificate; Richard Keene (pro.), medal; M. P. Copland (ama.), certificate; Frank Sutcliffe (pro.), medal; W. Cobb (pro.), certificate; Symonds and Co. (pro.), certificate; Hedges and Son (pro.), certificate; Lunden (ama.), medal; Colon—(ama.), certificate.

*Class B.*—W. W. Winter (pro.), medal and special commendation; H. Van der Weyde (pro.), medal for series, and certificate; J. Lafayette (pro.), medal; P. Nadar (pro.), medal; Jacolette (pro.), certificate; Webster Brothers (pro.), certificate; Werner and Son (pro.), medal; G. E. Bicknell (ama.), W. Adcock (ama.), certificates; W. J. Byrne (pro.), T. J. Dixon (pro.), medals; Elliott and Fry (pro.), certificate.

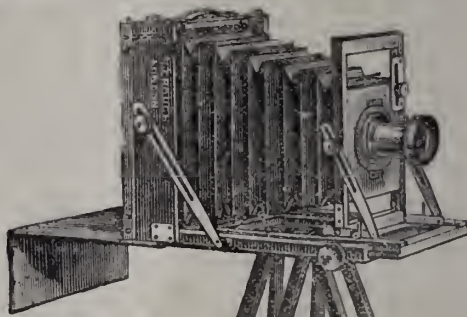
*Class C.*—Lyd. Sawyer (pro.), medal; Mayall and Co. (pro.), W. Shawcross (pro.), certificates; H. P. Robinson (pro.), medal; W. H. Geddes and Son (pro.), certificate; W. Nicholson (pro.), P. M. Lawes and Son (pro.), Dixon and Sons (pro.), T. J. Hirst (ama.), medals; Dr. Verwaest (ama.), certificate; W. Griggs (pro.), medal; W. A. Powell (pro.), MacIure and Macdonald (pro.), Gus. Rainger (pro.), certificates; J. R. Dimlop (ama.), medal; S. Francis Clarke (ama.), A. Piingle (ama.), certificates. Special for carbon: T. G. Whaithe, medal; W. P. Marsh (pro.), certificate. Genre: J. Terras (ama.), medal; Dr. Alabone (ama.), certificate. Still life: P. Bellingard (pro.), medal; H. Stevens (ama.), certificate.

*Class D.*—Special award for new process: The Eastman Dry Plate and Film Co., medal. Lantern slides: Woodbury Printing Co., medal; G. W. Wilson and Co., certificate; J. Gale, certificate.

*Special Awards.*—For series of reproduction in platinotype: medal to F. W. Edwards (pro.), with very high commendation by judges. For series in platinotype, "Andorra Views," medal to F. H. Deverill. For series in silver: medal to Dr. Ernst Seligmann.

Amongst the apparatus exhibits we may direct the attention of the visitor to the exhibit of Marion and Co.; and perhaps our amateur readers will be most attracted by Berthon's Collapsible Portable Studio—an elegant and convenient tent, easy to put up and take down. It is provided with a variable opening at front, and can be easily turned to adapt it to varying conditions of lighting; indeed, we take it that with this tent, on an open lawn, the portraitist would have some distinct advantages over the ordinary glass house. One serious objection to this tent seems to be the considerable probability of the women-folk of the household taking possession of it as a sitting place, and refusing to be evicted when the amateur photographer of the establishment desires to use his camera. The tent should, we think, have a good sale, quite apart from its photographic use. There is also shown a portable dark tent of Berthon's, and, judging from what we saw, we think it likely to prove convenient in use.

Watson's exhibit of cameras is very excellent, and well calculated to uphold his reputation for good and careful construction; and the double action camera of Rouch also deserves very special mention, front and back being interchangeable, often a matter of considerable importance. Moreover, with Rouch's new camera one can easily adjust the centre of weight of the camera always immediately over the centre of the tripod head. A camera by Crouch, of the Barbican, on the shut-down front principle now so largely adopted, is also very excellent in its details, and, moreover, has a flap which covers the focussing glass, and so removes the most common objection to this form, namely, the need of using a case. The instrument in question is shown by the subjoined cut.



We can hardly leave the subject of cameras without referring to a fine instrument made by the Scovill Manufacturing Company, of New York, and exhibited by the Eastman Company. It is a camera for making large direct portraits in the studio, and taking plates 24 by 20 inches, focussing out to 6 feet. The dark slide is provided with interior bevil gearing, by which a plate of any smaller size can be conveniently gripped between parallel jaws.

Other exhibits of the Eastman Company require no special notice, as they have been already described in our columns; this latest novelty, "Transferotype," or positive stripping film, having been noticed a few weeks ago.

Lowness of price is a very characteristic feature of the exhibits of J. H. Skinner and Co., of East Dereham, Norfolk; this firm supplying a "boy's" set of photographic apparatus for 3s. 6d., and indeed a set capable of being used for the taking of a very passable photograph indeed. The three-and-sixpenny set includes polished mahogany sliding bellows, 4-plate camera with focussing-screen, dark-slide, lens, brass fittings, developing and fixing solutions, packet of dry-plates, and instructions.



The purchaser who expects a ten guinea set for 3s. 6d. will be disappointed; but he who only expects wonderful value for his money, and apparatus with which a careful and intelligent worker can make a photograph, will not be disappointed. Skinner and Co. also supply expensively-made cameras, but one of intermediate price (quarter-size, 10s.) deserves special mention as appearing likely to be of real service for hard work in the hands of the tourist.

Tylar's ingeniously designed and constructed novelties are displayed, and attract much attention; but we noticed nothing of importance which has not been sufficiently described in the PHOTOGRAPHIC NEWS.

Lenses by Wray and Swift are shown, and these rising makers of photographic objectives show considerable enterprise in endeavouring to make their instruments convenient for photographers to use. We were especially struck with the easy working and convenience of the "iris" diaphragm as now fitted, a double scale showing the aperture in relation to focus, and also the intensity according to the standard of the Photographic Society.

### FRENCH INSURANCE COMPANIES.

LAST week, under this heading, we gave some particulars extracted from *Galvani*, as to the procedure of a French insurance company in relation to the insurance of photographic goods. The following extract from the same publication, but of date February 26th, gives further particulars as to the same matter:—

"The action of Mr. Stebbing against a French insurance company, which we reported a week ago, has ended in a judgment of the Court for less than half the sum claimed. Mr. Stebbing intends to appeal, but he will probably go further and fare worse. The moral of the case is, that any French insurance company that chooses to deal liberally with its clients may make a large fortune. A case in point, from the history of insurance in England, may prove instructive to our neighbours. About twenty years ago, a ship, laden with gunpowder, lying in the Mersey, took fire, and the explosion broke all the windows within many miles. Every company, with one exception, refused to pay the claims of insurers, on the ground that the contingency was not included in the risk covered. The Royal Insurance Company alone paid every claim in full. The result is that the Royal, at that time a small company, is to-day one of the first, if not the first, in the United Kingdom."

### PRINTING-OUT ON OPAL, AND A SUCCESSFUL PRINTING-FRAME FOR THE PURPOSE.

BY W. M. ASHMAN AND R. OFFORD.

In a series of thirteen articles, published in the PHOTOGRAPHIC NEWS between March, 1885, and October, 1886, we entered somewhat fully into the question of printing-out upon gelatine in place of albumen. The chief results of some hundreds of experiments were recorded, and various formulæ given, by which distinctly good prints were obtained. We made no pretensions to novelty, except in the employment of commercial transfer paper as a basis upon which to work in one direction, and in the use of quantities of minute auric chloride mixed with emulsions to facilitate the toning of the prints.

Treating of the application of organified chloride of silver emulsions to printing on opal glass, we had occasion to point out the advantages possessed by the simple printing-frame, the invention of R. Offord, previously fully described in a leading article in the PHOTOGRAPHIC NEWS of March 14th, 1884, and illustrated in that of April 4th in the same year. The subject having recently cropped up, we think it desirable to draw attention to the ease with which those convenient frames can be constructed by any photographer with a little mechanical skill. The illustrations will make clear a few words of description.

The materials required are, a common printing-frame, preferably a size larger than the negatives to be printed from, so that a clear glass can be firmly fixed in by the corners with a little shellac, or some cement, such as Prout's glue; on this the negative can be adjusted and secured by narrow strips of gummed paper across two opposite corners, a piece of stout zinc plate a little longer than the back of the frame, a few one-inch wire nails, and a few one-inch circles of india-rubber rather less than one-eighth of an inch in thickness, and perfectly smooth on one side. The illustration represents the back of a 5 by 4 printing-frame, the size suitable for small

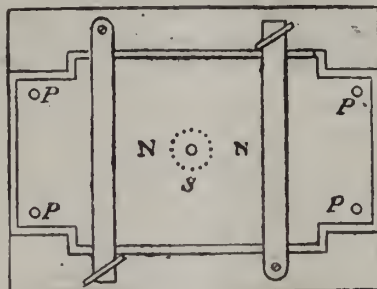


FIG. 1.

work, and the same in partial section. Remove the wooden back of the frame and cut the zinc to shape, as in fig. 1. Make the four holes *p, p, p, p*, in corners accurately to fit on four wire nails. Lay the zinc on the frame, as shown, and drive the nails through the holes, upright, which is more easily managed if a fine bradawl is used first to bore the wood in the exact centre of each hole. Cut off the heads of nails with cutting pliers, and see that they are perfectly upright, and that one end of zinc and frame is distinctly marked. The zinc can then be taken off and replaced in perfect register as often as required. The same effect can be partly secured by hinging one end of a wooden or metal back by a pair of good hinges, but this does not allow for variations in the thickness of negative and opal glass. Then take one of the circles of rubber, and having made a small hole through the centre of the zinc, rivet the former to the latter by means of a nail, which can easily be done if the head of the nail is large enough round, and is filed smooth inside, the sharp edges being removed. The head thus forms a washer, and the riveting being done outside the zinc the rubber should assume the form of a cup or sucker, and, being moistened with a touch of glycerine and water, will adhere securely when pressed on to the opal.

Fig. 2 shows the arrangement complete: *s* the sucker, *o* the opal, *n* the negative, *g* fixed glass, *z* zinc back, and *p* nails, all in proportion. If the head of the nail will not do, a small washer must be cut out of a piece of stout tin plate, or of brass, with a hole to fit the nail. The latter is then put through the zinc the other way, and the rivetting

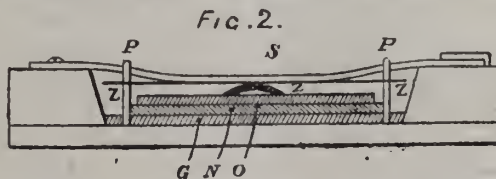


FIG. 2.

done inside. If the rubber is good, and the fixing of it effective, and if, when not in use, it is left unpressed, one will be found to be sufficient for small pieces of opal up to C.D.V. size; beyond that, two or three may be employed, or even more. With indifferent rubber, roughly arranged, it is safer always to have two close together. For a durable arrangement we prefer stout tin plate instead of zinc, as the latter, being soft, has a tendency to wear in the holes.



We understand that a frame similar to this has been shown lately as a novelty, but we have not seen it. We would merely refer our readers to those numbers of the PHOTOGRAPHIC NEWS for 1884, mentioned above, when it will be seen that the frame therein described does not materially differ from the one in our illustration.

A striking instance of the satisfactory employment of one sucker was exhibited at one of the meetings of the Photographic Society of Great Britain some few years ago. One of R. Offord's frames, precisely similar to the above, was shown by W. M. Ashman, with an opal print therein, which had purposely been examined six times, and replaced, without showing any trace of being out of register. No special precaution is requisite, but of course the back with the opal attached can more easily be removed if it is lifted at each corner at once, and so kept parallel with the frame. The same plan should be adopted upon replacing the back. The print when finished will come away from the sucker by sliding it to one end, and here also the glycerine and water are useful.

As there is no pad, we have found it sometimes useful to place a piece of stout cloth, or a few folds of paper, between the back and the springs of the frame. The inside of the zinc should be painted black.

We shall be glad to hear of others having proved the utility of this simple contrivance, with which several have been well pleased.

Since the publication of our series of articles on gelatino-chloride of silver, several efforts have been made to introduce, commercially, printing-papers manufactured with gelatine, silver chloride, and organic salts: such as that of Obernetter, which seems to us to give very fine results; and occasionally we have observed advertisements of opal glass with some compound chloride emulsion, such as we have described. This shows that experiments in this direction are being carried on, and we feel sure that, sooner or later, there will be a considerable demand for some substitute for albumen, which will print as quickly, and give greater brilliancy in the shadows. Our experience teaches us that with a citro-chloride emulsion spread on paper or opal, or even, better still, with a gelatinized paper suitably salted, and sensitized on a silver bath, it is possible to print up dense high lights without obscuring the darker details; the process of printing appearing to stop just at that point where albumenized paper begins to bronze and blacken hopelessly. On the other hand, with weak negatives, by printing a little slowly, such papers will give far superior results to albumen.

To experimentalists we would give a word or two of suggestion. The tendency exhibited by organic chloride emulsions to turn slightly yellow is often found to be a great drawback to their employment, especially on opal. The colour we speak of is not removable by hypo, or by acid and alum. It seems to be a staining of the gelatine. We conducted a series of experiments in this direction which proved that if the effect cannot be traced to the overheating of the gelatine, or the employment of stale or weak hypo solution, it must be looked for in the excess of organic salt employed. This is scarcely ever seen in a plain acid chloride unwashed emulsion. We prepared a mixture of gelatine and various salts at as low a temperature as possible, coated opal plates, and kept them with no special precaution against air or slight damp. The result was, that all containing organic salts were more or less stained, chlorides quite white. Hence an excess of any such salt as sodium citrate is very likely, with even gentle heat, to produce discolouration. At the same time, the difficulty in making pure silver citrate without a little excess of the citrate salt makes it impossible to avoid that excess. This difficulty is increased by the fact that the chromic acid colour test for free silver is useless, as that acid decomposes silver citrate; and, of course, a chloride test acts in a similar manner by substituting HCl for citric acid.

This is partly why we recommended the making of separate emulsions of chloride and citrate, and washing each to remove as much of the nitrates and citrates as are not required to render the printing vigorous. We observed that the potassium salt was more likely to produce the yellow tint than that of sodium or ammonium. This salt is also more prone to exhibit that special characteristic of all the citrates, namely, the tendency to coagulate gelatine. Upon keeping an emulsion made with excess of citrate, it is very liable to become insoluble for that reason; and we have known of three days being sufficient to bring about that result. Our investigations in this direction are yet progressing, and we believe that there is ample field for careful experiment, and sufficient to interest either the professional or amateur who cares for such work.

## INSTANTANEOUS STUDIES.

### NO. 14.—CHARITABLE PHOTOGRAPHY.

*Mrs. Jellaby.* Do you know that I have taken up photography?

*Unsuspecting Friend.* Really! I was not aware you had an interest in such matters. I thought your time was entirely occupied with the poor heathen in Africa.

*Mrs. Jellaby.* So it is—at least almost entirely; but for all that I've found time to practise taking photographs. The occupation, I assure you, is most fascinating.

*Unsuspecting Friend.* So I've heard. And how are you getting on?

*Mrs. Jellaby.* Oh, splendidly. You'll scarcely believe it, but I've brought my camera with me (*produces leather box with handle*).

*Unsuspecting Friend (with surprise).* That? Dear me, I thought it was a missionary collecting box.

*Mrs. Jellaby.* Oh, well, I had the name of the "Mission to the Borial: Boolah Gahs of Central Africa" put on the box, because I thought it looked well. But do let me try and take your photograph.

*Unsuspecting Friend.* But you cannot take a photograph in this room?

*Mrs. Jellaby.* Indeed I can. You see, I have all the apparatus here (*produces a folding tripod from leather case*). On the outside of this case I have had the words "Mission to the Wagga Waggas of Central Australia." Very complete, is it not?

*Unsuspecting Friend.* Exceedingly so.

*Mrs. Jellaby.* Now, will you sit down in this chair? Ah! a little nearer the light, if you please.

*Unsuspecting Friend.* But it is giving you so much trouble.

*Mrs. Jellaby.* Not at all. (*Poses sitter and takes photograph*). Thank you.

*Unsuspecting Friend.* Can I see it?

*Mrs. Jellaby.* Not yet. But I'm sure it's a lovely portrait. You've no idea what a charming expression you had. Now, how many copies would you like to have?

*Unsuspecting Friend.* Oh, you are too kind, but I must leave it to you. I'm sure I should be quite satisfied with one.

*Mrs. Jellaby.* One! Ridiculous. You must have half-a-dozen at least. I'll tell you why. You see, I'm collecting subscriptions for my two favourite missions which are doing such valuable work, and I generally ask those who sit for their photograph to contribute say at the rate of ten shillings the dozen. The price really is very low, and you see the system has this advantage: you get something tangible for your money. Of course the consciousness that you are doing good to the poor heathen ought to be a sufficient motive for contributing a trifle, but we must stoop, I am afraid, to the—may I say the mercenary side of human nature?

*Unsuspecting Friend (taken aback).* You wish me to pay for the photographs?



\* Read before the Society of Amateur Photographers of New York.



A step in this direction was the Woodbury film, which I exhibited before this Society a little over a year ago. The support employed was a special thin paper treated with a resinous substance to make it transparent, and coated on both sides with gelatine sensitive emulsion. The film was quite delicate when wet, and easily torn. When dry, it presented a peculiar crinkled or wrinkled appearance, which was not altogether satisfactory.

Last fall, a new transparent film based on the invention of Francis H. Froedman, a chemist, of Dublin, Ireland, was introduced, and is now supplied by the Vergara Film Company, of London. This is the film which I wish to exhibit and explain to you to-night, samples of which were kindly sent to me by the Company. The film is patented in England, but not in this country, so far as I have been able to learn; hence, there is no reason why it cannot be made successfully here.

An extract from the patent says that the best gelatine, either the hard or soft kind, is used, according to circumstances, which is soaked for a certain time in water to soften it; it is then heated on a water bath, having additional water added until it is completely dissolved. Then a solution of bichromate of potash is added to the hot solution, and also certain proportions of alcohol and glycerine to make the solution flow well, and give the film pliability.

The formula which works well is as follows:—

Take of the best hard gelatine	...	...	3 parts
Water	...	...	24 "
6 per-cent. solution bichromate of potash	...	...	4 "
Alcohol	...	...	4 "
Glycerine	...	...	$\frac{1}{2}$ part

This is filtered through a flannel, and is then ready for use.

The film is prepared on a glass plate treated with talc. The plate is first coated with enamel collodion, washed and drained, then coated with the hot bichromated gelatine solution on a levelled marble slab, and dried, free from dust, at a temperature of 65° to 70° F. In place of collodion, the gelatine may be put directly on the glass, provided a rubber edging solution is used.

The bichromate plate, when dry, is next exposed to sunlight or shade until it is made insoluble, as will be indicated in the change from a yellow to a brown colour; it is then washed in water sufficiently to remove any soluble bichromate salts not affected by exposure to light, and is lastly immersed in a solution of sulphurous acid or its compounds, which bleaches the film and renders it more transparent. When sufficiently acted upon by the acid, the plate bearing the film is washed in several changes of water until no more acidity is perceptible.

When thoroughly dry, the film is next coated in the usual way with the sensitive gelatine emulsion, then dried, and stripped from its glass support by cutting around the edges. The film may be made in long lengths suitable for the roll holder.

It is perfectly smooth and flat, and looks very much like a thin glass plate. It is not affected by hot or cold water, and is insoluble in dilute acids and alkalis. The patent is dated May 3, 1887.

From the foregoing description, it will be seen that the film is virtually nothing more than an insoluble gelatinic skin, rendered nearly colourless by sulphurous acid, coated with a sensitive emulsion.

From a few experiments I have made with the film, I am convinced that it can be treated just as easy and certain as glass, and is much better than paper, because it is quite tough, like leather, and will not tear. I have discovered that very cold weather causes the film to curl some on the emulsion coated side, while in a temperature of 60° or 70° F. it will flatten out nearly straight. I use the film on an ordinary Eastman carrier, which clamps the edges down flat. It may be slid in an ordinary plate-holder with a thin plate at the back. But the special carrier is the best.

The sensitiveness of the film is governed by the sensitiveness of the emulsion put on it. In making a test with Warnerke's sensitometer, using a strong potash developer, I find the highest number registered is 17, while a Cramer 40 plate registers 22. Both were developed at the same time in the same developer for five minutes. The highest numbers can be seen by holding the plate or film over a piece of white paper. Cramer's plate is, therefore, ahead on sensitiveness.

The development of an exposed film is very simple, and is carried on precisely like a plate. The film should first be soaked in water not colder than 60° F., for perhaps two minutes, until it lies flat. If the water is very cold the corners and edges will at first curl upward a little. Then the water is drained off and

the developer applied. That recommended is the pyro and ammonia developer, but I find the potash developer based on my formula works excellently. On the sample films I have brought, I employed three grains of pyro to the ounce, and six grains of potash. The development proceeds gradually, is under perfect control, and the film in the wet state can be easily removed and examined by transmitted light. The patented tray exhibited before the Society a short time ago, in which the film could be clamped to form its bottom, would work excellently, since the tray acts as a frame to hold the film.

After development, which usually takes about as long as a plate, the film is removed from the tray by taking hold of one corner and sliding it out on a glass plate; it is then held under the tap and washed for a minute, removed from the plate, and placed picture side upwards in the hypo bath, which should not be too cold (strength, 1 oz. to 4 oz. of water); it fixes out in a few minutes, is then washed for half an hour by soaking in three or four changes of water. Unless the film is completely fixed and well washed it will dry out with a slight yellow tinge. My first experiment in drying the film was to place it, while damp and limp, picture side upwards, on a glass plate; then I set the latter in the drying rack. In the morning the film had fallen off, and was somewhat buckled up. But the rapidity of drying, as recommended by a special process, is one of the excellent points, which I will demonstrate at the close of this paper.

Removing the limp and leather-like negative from the wash water, slightly draining off the surplus water, you simply put it in a tray and pour over it an ounce, or less, of common alcohol, and let it soak for fifteen minutes. Before the end of that time you will notice that the film becomes quite rigid. After soaking in alcohol I place the film between two sheets of clean blotting-paper, and bend them around a paper cylinder, such as is used for mailing purposes, not less than three inches in diameter, so that the coated side of the film will be outward, and clamp the paper to the cylinder by two or three elastic bands. If the film is removed from the alcohol before the time specified, it will stick in places to the blotting-paper.

If kept in a draft of warm, dry air from five to fifteen minutes, the film will become perfectly hard and dry, retaining, of course, the curve of the cylinder; but when put in a printing frame under pressure it is made quite flat, and as smooth and even as a glass plate.

The buckled film negative spoken of I treated in this way, wetting it first until it was limp, soaking in alcohol, and then bending it around the cylinder; it dried perfectly flat and smooth. Fresh alcohol should be used for each separate film.

There appears to be no better way to dry the film smooth. I tried squeezing it face downwards on a sheet of vulcanised rubber, but when dry it shrunk and buckled up unevenly, as you will see by the specimen I have brought. If the film is suspended from two corners on a line to drain and dry, it will take an hour or more, but it will curl inward around the edges. This may be overcome somewhat by soaking the film in water containing a small percentage of glycerine previous to drying. It is also a good plan when the film is surface dry to place it between sheets of blotting-paper, putting the latter in a printing frame; the pressure of the spring will case the film to dry flat. The film does not frill, and there is no danger of the sensitive film slipping off as it sometimes does on glass plates.

It has been said that the film is adapted for photogravure purposes, because it can be printed from on either side. I estimate it to be about  $\frac{1}{8}$  of an inch thick, and find when it is printed from on the wrong side there is a slight blur. Still there is no reason why the film may not be made sufficiently thin to be used from either side. The picture on the film may be as readily intensified or reduced as on glass.

The manifest advantages of this film to the tourist are that it supplies all the good qualities of glass and paper, with none of their drawbacks; being as light as paper, large quantities can be carried in a small space.

I submit for your inspection five 2½ inch square negatives made by contact from transparencies, and a strip of a part of an original negative made on a film not backed with collodion, accompanying all with a silver print. These were sent to me by the Company as specimens. I also have two or three 4 by 5 negatives made by myself, one exposed instantaneously with Hoover shutter, Ross lens, 7½ inch focus, f stop; another time exposure same lens, three seconds, very cloudy at time, and an over exposed negative having the peculiar buckling appearance obtained by drying on rubber. I also have a transparency made by contact from one of these negatives, deve-



loped with oxalate of potash and iron; also a sample of the film, a portion of which was dipped in hot water to dissolve off the sensitive film. You will notice the remarkable transparency of the shadows in all.

Thanking you for your attention, I close with the hope that a film equally as good may yet be produced in this country by some of our energetic manufacturers.

### A NEGLECTED METHOD OF SILVER PRINTING.

BY CHARLES L. MITCHELL, M.D.\*

DURING the past five or six years, and with the advent into popular use of the dry plate processes of photography, considerable attention has been given to different methods for producing by photographic processes various artistic effects in printing the picture, in simulation of those obtained by the mechanical processes of the engraver and etcher. The albumen silver print reflects the general popular taste, and when artistically made, is always pleasing, but the gloss and brilliancy of its surface soon becomes monotonous and even wearying, and the eyes seek relief in the mellow tones and soft outlines of a well executed etching or engraving. This has led to the introduction of the various forms of bromide paper, "Alpha" paper, platinum prints, &c., all of which seek to reproduce on a dead or mat surface paper, by different chemical methods, the blacks, purples, greys, and various half-tones, obtained by the skilful use of the engraver's tool, and to give effects corresponding to those found in a fine line engraving.

The use of these papers has led to considerable change in the styles of photographic printing, and although the albumen print will probably always be to a very large majority of persons "the photograph," and the only form recognized by that title, there will remain a considerable minority to whom the other more novel and more artistic styles of photographic printing will prove most interesting and enjoyable. The use of bromide paper for preparing prints, and particularly for enlargements, is rapidly increasing, and yet the writer feels compelled to acknowledge that after considerable experience in its use, he has frequently been disappointed in the results obtained from it. For enlargements, which can afterwards be worked up with the stump and crayon, it leaves nothing to be desired, but for contact prints and enlargements of moderate size, which are to receive no further finishing, it must be confessed that there is often in the finished bromide print a lack of the finer details of the picture, which is rather disappointing when compared with a good albumen print prepared from the same negative. Furthermore, the process is to a certain extent one which must be carried on in the dark—in a double sense—for not until the paper is exposed, and the latent image has commenced to show itself under the influence of the developing solution, does the operator know whether his exposure has been properly timed so as to secure the best print, and it is then too late to more than partially remedy the difficulty by influencing or modifying the remainder of the already partially completed development. It is true a succession of trials will soon determine the proper exposure for any one negative, but this takes time and is expensive, so that among photographers, and particularly amateurs, to which class the writer now mainly addresses himself, the remark is often heard, "Yes, bromide prints are very beautiful when you can get them just right, but I find much difficulty in doing so, and but few negatives produce fine results. For general work I prefer a good albumen print."

The purpose of the writer this evening is to call attention to a style of silver printing once quite popular, but now fallen into comparative disuse, which is, while probably no better in its finished result than the bromide process at its best, yet considerably more certain in its result, at least, as easy in its execution, and affords a variety in effect much superior to that produced by the bromide process. I allude to the old method of printing on plain paper, sensitized with chloride of silver. Years ago, in the time of the old wet plate processes, this method of printing was quite popular, but of latter years it seems to have dropped almost completely out of sight, and there is but brief mention of it made in the different technical works on photographic printing. Yet it gives results which are so extremely beautiful, that it seems but proper that more attention should be directed to it, and particularly by those artistic photographers who are always seeking new and beautiful photographic effects. In portrait work it gives beautiful, soft outlines and warm tones, and for landscapes, architectural studies, genre pictures, copies

of old engravings, &c., it gives results which, for softness, delicacy, and perfection of tint cannot be surpassed by any other method with which the writer is acquainted. With it a great variety of tones can be obtained, ranging from a sepia or a rich brown to a deep purple or even black, capable of reproducing, in many instances, the same soft and warm tints of an old mezzotint or copper plate engraving. Furthermore as the process is conducted in the same manner as in ordinary albumen printing, the period of exposure is not an uncertain quantity, but the printing can be watched as it goes on under the printing frame, and the depth of the print, and consequently the character of the subsequent tone, regulated according to the taste of the operator.

The details of the process are briefly as follows: The paper used should be an ordinary plain white paper—Rives, for instance—with a moderately smooth surface. This is to be salted in the usual manner with a soluble alkaline chloride (sodium or ammonium), a small quantity of gelatine or albumen being added to the bath, so as to give a slight size to the paper, and the paper subsequently well dried. Such paper can generally be procured from the dealers, already prepared, and the writer has been in the habit of using Morgan's Salted Mat Surface paper, obtained from Messrs. McCollin and Co., of this city. Other varieties of white paper with a rougher surface, corresponding in grain to the "C" Bromide paper, may be prepared in a similar manner, and the writer hopes to be able to make further experiments in this direction.

This prepared and salted paper is now to be sensitized. This is done by floating it on a sensitizing bath composed of fifty grains each of silver nitrate and ammonium nitrate to the fluid ounce of water. This bath should be kept slightly alkaline by the presence of a small quantity of silver carbonate (produced by adding a few drops of a solution of sodium carbonate to the bath), the clear supernatant liquid being always poured or filtered off from the precipitated silver carbonate before the bath is used. The paper should be allowed to float on this bath for from three to five minutes—three in summer, five in winter—and then hung up to drain and dry. All these operations must, of course, be performed in a darkened room, the same as in silvering albumen paper. When thoroughly dry, the sensitized paper must be fumed with ammonia for fifteen minutes, in the fuming box, and is then ready to print. This is done by exposing it, under the negative, to the sun, in the usual printing frame. The paper prints rapidly, and from time to time the frame must be removed to a dark place, and the progress of the printing inspected. Here is one of the great advantages of this process over the bromide process, for the operator can see just what he is doing, and can at any time stop the printing when the colour of the print shows it to have gone far enough. The prints when removed from the printing frame are to be soaked in a bath composed of acetic acid one oz., water one pint, for about fifteen minutes, and then this poured off, and the prints washed with half a dozen different changes of water, until nearly all the free silver has been removed. They are now ready for toning. The toning bath used is that formulated by Dr. E. L. Wilson, and is composed as follows—

Water	...	...	...	...	32 fluid oz.
Acetate sodium	...	...	...	...	60 grains
Chloride sodium	...	...	...	...	60 "
Chloride gold	...	...	...	...	4 "
Nitrate uranium	...	...	...	...	4 "

"Neutralize the gold and uranium, previously dissolved in a little water, with sufficient bicarbonate soda. Before using, add gold to renew the bath, as necessary."

The prints are to be introduced into this bath, one or two at a time, and allowed to remain there until the proper tone is reached, the dish being kept gently in motion during the operation, so as to avoid uneven toning. This portion of the operation requires careful watching, as, owing to the porous and absorbent character of the paper the prints tone much more quickly than the glossy albumen prints. A few minutes is amply sufficient, and for the lighter tones of sepia and brown, it is enough to but dip them in the toning bath for only a few seconds. A little experience will soon indicate the proper length of time. After removal from this bath, they are to be rinsed with several waters, and then transferred to the fixing bath. This is best made as follows:

Hyposulphite sodium	...	...	...	2 ounces
Salt	...	...	...	1 ounce
Bicarbonate soda	...	...	...	$\frac{1}{4}$ "
Water	...	...	...	1 pint

\* Read before the Photographic Society of Philadelphia.



Any of the ordinary hypo baths used for fixing prints will answer equally well, however. The prints are allowed to remain in this bath for about fifteen minutes, then removed, well washed in several changes of water, soaked for about ten or fifteen minutes in a bath of a strong solution of alum, to remove the last traces of hypo, and then thoroughly washed in running water for several hours. They are now finished, and can be dried by hanging them on a line, or by pressing them on a line between blotters; the latter is best. They can then be appropriately trimmed and mounted as desired. The writer has found it to be of an advantage to render them more pliable by dipping them in a 10 per cent. solution of glycerine in water just previous to drying them. They dry rather more slowly, but they mount much more evenly and smoothly. The prints which I now have the pleasure of showing you will illustrate much better than I can describe the different tones which can be obtained by this process. They represent landscapes of various characters, and also some copies of engravings, and I think will show fairly well the great range of tints and tone effects capable of being produced by this method of "matt printing," if I may so term it. These different effects can be produced by a little study of two particular parts of the process—the printing and the toning. Deep printing and quick toning will give sepias and browns; deep printing and long toning will give purples and blacks; light printing and short toning will give light sepia tints, and light printing and long toning will give cool grays and slate tints. Various intermediate effects between these can be produced with a little experimenting. The process is comparatively easy, sure of good results, and not expensive.

### Notes.

An excellent example has been set by the Liverpool Astronomical Society to make known its members to each other. So far as Liverpool itself in connection with the Society is concerned, it is little more than a name. There are but few local members, and the bulk are drawn very far afield. Many do not reside in England, and hence a large proportion are quite unknown. So that an acquaintance with features at least may be brought about, it is proposed to publish album cards which contain about fifty photographs, every one being numbered corresponding with a reference key. About ten such cards will be issued, and copies sent to every member, so that each will be able to see what the others look like.

Photography has much to answer for in respect to the fostering of vanity. Weekly journals appealing to various interests, trade papers, and even financial organs abound now-a-days with portraits of gentlemen estimable, no doubt, in their particular spheres, but utterly unknown to the general public. These portraits are, in nearly every case, derived from photographs, and indeed without photography would be unattainable. We are not in the secrets of those papers which make a speciality of publishing portraits of estimable non-entities, and we do not know what are the arrangements under such circumstances. It is impossible to say whether those whose portraits appear pay for the privilege, whether the papers present them with any honorarium, or whether any money passes. The investigations into the Wilson scandals, however, throw a somewhat lurid light on these transactions as conducted in France. M. Wilson, for instance, denies that he ever asked £8,000 a-piece of certain rich manufacturers for crosses which they thought he could obtain, but that he only asked it for puffs and portraits of themselves, which

were to be inserted in *Le Moniteur de l'Exposition*. No doubt Wilson's advocate is right when he remarked that "Nothing is so heavily taxed as vanity," but £8,000 is rather a high price to pay.

A convenient pocket almanac is sent by R. W. Thomas and Co.: a small enamelled card folded once and with rounded corners. Besides the almanac we have Burton's table of exposures, and also Dr. Scott's table. In addition to these, there is a eulogium of Thomas's plates, the carrying of this being the price to be paid for the conveniences mentioned.

Also we may mention the convenient pocket diary sent monthly by Mawson and Swan from their London store in Soho Square: about fifty pages of useful matter, and space for notes. Of course we have, in addition, some words in praise of Mawson and Swan's wares.

This from America. "Photographer (to sitter): 'I saw you at church last Sunday, Miss Smith, and also your friend, Miss Brown—if you could raise your chin a trifle, thanks—and what an atrocious looking hat she had on.' (After a pause): 'There, Miss Smith, it is over, and I think we have caught a very pleasant expression.'"

A correspondent writes:—"There is great want of an ebonite tray to take two-half plates, or a double half-plate, i.e.,  $9\frac{1}{2}$  by  $6\frac{1}{2}$ ; but I cannot obtain such an article anywhere." Perhaps some enterprising commercialist will cause this need to be supplied; or maybe such a tray is already in the market.

The oculists of New York have been much exercised by the publication of a book on "Functional Nervous Diseases," in which the author, Dr. G. T. Stevens, claims to have discovered that a large majority of cases of nervous diseases are due to difficulties attending the function of accommodating and adjusting the eyes in the act of vision, or irritations arising from the nerves involved in these processes. The book is severely criticised in the *Jewellers' Circular and Horological Review* by Dr. C. A. Bucklin, who makes much of what Dr. Stevens considers his most convincing argument, namely, the evidence furnished by photographs of patients taken before and after operation upon the eye. In one case Dr. Stevens says, "it is needless to tell one who examines these two pictures that the change was marvellous." Dr. Bucklin agrees that the change is marvellous—so much so, that "before operation the photograph is so printed that the child appears to be a decided brunette; four days after operation she appears as a blonde." Proceeding to criticise the photographs more minutely, Dr. Bucklin discovers that the measurement of the brunette's head is vertically  $1\frac{3}{4}$  inches and the breadth  $1\frac{3}{8}$  inches, while that of the blonde is 2 inches and  $1\frac{1}{2}$  respectively, the former photograph being badly printed, and the latter printed with great care. These changes Dr. Bucklin asserts to have been produced principally by optical changes within the control of the photographer.



Four other specimens Dr. Bucklin examines, and in each case he says that the photographs before operating are badly printed; in one instance so badly "as to be unrecognisable;" while those after operating are perfectly executed. In one pair of pictures he contends there are striking discrepancies of measurements, the two heads being vertically "sufficiently alike not to merit criticism," while the horizontal measurement of one is  $1\frac{3}{4}$ , the other being one inch only. He remarks on this, "It is a strange photographic lens which will, without any intention on the part of the operator, distort the horizontal measurements of a head three-eighths of an inch without disturbing its vertical measurements. This piece of art would be an interesting subject for photographers to discuss. We have no space."

As to the interesting nature of the subject, there is no doubt; but in the absence of the photographs in question we have, like the *Jewellers' Circular*, no space for the discussion. It would seem, however, unwise to rely upon photographs to settle disputed questions, especially when doctors differ. The controversy is only one more argument against the supposed infallibility of photography. The world is gradually coming to the belief that the high character for truth which the camera once had is fast disappearing.

Focardi is engaged upon a companion figure to his well-known and much photographed group, "You dirty boy!" It is to be called "The clean boy." The expression of agony on the dirty boy's face was obtained by a series of pinches, the model being paid at the rate of sixpence a pinch. Had the boy been photographed after the first pinch the sculptor would have had all the material he wanted, and much physical pain would have been avoided; but whether this would have satisfied the model may be questioned. Most likely he would have chosen the pinches and the sixpences. The "clean boy" will not find the occupation of sitting so profitable. But probably it will be pleasant, as Focardi, in his desire for realism, will, of course, adopt some method of securing the smug self-satisfied look which everybody has after his face has been washed. Most likely he will try the plan of relays of sweetstuff and jam tarts.

The manners and customs of the South Sea Islanders are not ours. There is a good deal at which the British matron would lift up her eyes in holy horror. But in the eyes of those ingenuous people of the South Seas we are not immaculate. The inhabitants of the Sandwich Islands, for instance, have a Mrs. Grundy who draws the line at the public exhibition of photographs of exalted personages. When Queen Kapiolani and the Princess were over here they were photographed in the Paris costumes provided for them by Worth. In an evil moment her Majesty permitted these photographs to be exhibited in the shop windows of their native land, and this has so outraged the Sandwich Islanders' notion of propriety that they demanded the rich costumes, which, when produced, were torn to pieces. It is said that wear-

ing the clothes of Europeans was the cause of offence, but we fancy had her Majesty not shown herself clad in them they would not have been destroyed.

*Apropos* of the Crystal Palace Photographic Exhibition and amateur photographers, the writer who is responsible for the "Waifs and Strays" column of the *Weekly Dispatch* resuscitates an oft-told tale. Last autumn twelve-months, he says, he stayed at a country house where a young gentleman proposed to photograph the company on the lawn. Unfortunately, the artist accidentally took in another group (of two) in an adjacent arbour, who were neither expectant nor desirous of the honour. The results—domestic, legal, and otherwise—were disastrous, including the untimely ruin of the social career of the innocent artist. The story is very good so far as it goes, but we wish it had been fresher. We have heard a good many which bear a strong family likeness to it.

### THE PINHOLE CAMERA.

BY WILLIAM H. PICKERING.

HAVING recently had occasion to take several photographs, using a pinhole as a substitute for a lens, I was much surprised at the distinctness of the images. The resulting negative is of course not as sharp, and a silver print from it would not look quite as well as if taken with a lens; but for bromides, where the detail required is not so great as for silver prints, very satisfactory results may be obtained. I have recently taken a number of photographs with pinholes of various sizes, and the following facts have been deduced: (1) The distance from the hole to the plate may be as short as desired, but should not exceed 12 inches. (2) The shorter the distance the better the definition. (3) The size of the hole is regulated by the distance. For a distance of 12 inches the best results are obtained with a hole measuring three one-hundredths of an inch in diameter. If smaller than this, the image is blurred by diffraction; if larger, the image is likewise blurred. But for most purposes where shorter foci are used, we may lay it down as a rule that the aperture should in no case exceed a fiftieth of an inch, nor be much less than one-hundredth. As regards exposure, with one-hundredth of an inch aperture, and a focus of 3 inches, on a sunny day with a rapid plate, one should give about ten seconds. So that, although the exposures are longer than with a lens, it will be seen that they are by no means excessive.

The pinhole may be made in a piece of black paper, or in a piece of thin sheet metal, which should afterwards be thoroughly blackened. In either case the burr must be carefully removed. A simple method of avoiding the burr is to burn the hole in paper with a red-hot needle.

The advantages of the pinhole camera are: (1) That doing without the lens one saves weight and expense. (2) That one can take as wide an angle as the camera will admit of, say 120 degrees on the horizon against 80 to 85 degrees with a wide-angle lens. (3) That all objects, near and far, will be in equally good focus. (4) That one may suit the size of the image to fit the plate without changing one's point of view. (5) That one may take a view, if necessary, directly towards the sun, as there is no trouble from fogging caused by the sun illuminating the surfaces of the lenses. Indeed, very satisfactory photographs may be secured showing the sun in the picture. In this case, however, the sun takes black instead of white, owing to the reversal caused by over-exposure. Finally, while not advising photographers to throw away their lenses and substitute pinholes, I wish to call their attention to the fact that the pinhole picture is not a thing to be wholly despised, and that there may occur circumstances under which the pinhole may prove a very useful auxiliary.

The pinhole principle may also be used for another purpose, more amusing, perhaps, than artistic, which was first suggested to me by Mr. J. R. Edwards. Let us substitute for the lens a narrow vertical slit, about three inches long by one-fiftieth of an inch wide, made by pasting two strips of black paper side by



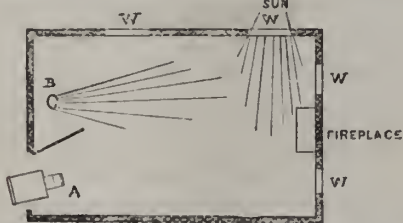
side. About two inches behind this arrange a horizontal slit of the same dimensions. Two inches behind this place the sensitive plate. The apparatus is analogous to two cylindrical lenses of different foci placed at right angles, but is more readily adjusted. If an exposure is now made we shall find everything distorted to twice the size horizontally that it is vertically. By turning the camera on its side we get a vertical distortion. By inclining the slits at different angles variously distorted pictures may be obtained.—*Anthony's Bulletin*.

### PHOTOGRAPHING INTERIORS BY THE AID OF THE MAGNESIUM FLASH LIGHT.

BY F. C. BEACH.\*

IN a communication from the President, A. S. Murray, of the Pittsburgh Amateur Society, he states that he has been successful beyond his expectation in photographing an interior in the daytime, using as an aid the magnesium flash light.

The diagram shows the arrangement of the camera and light.



W represents windows, A the camera located in the doorway, B the position of the flash light behind the door, F is a fireplace. In the window nearest the camera the sun was streaming in. He says: "I took it at eleven o'clock in the morning. After drawing the slide I stood near the door, uncapped the lens, and from behind the door flashed the magnesium light as quickly as possible and recapped the lens, the estimated time of exposure being, perhaps, two seconds. I used 30 grains of magnesium powder,  $7\frac{1}{2}$  grains powdered chlorate of potash placed on enough cotton to act as a fuse. The resulting negative is well timed, shows no halation at the windows, and the smoke and flame of the fire in the fireplace is well brought out. If you have not tried this scheme, do so; it will pay."

He omits to state the size of stop employed, but I presume it must have been about one-sixteenth. I have a print from the negative which I will pass around. It appears to be an excellent plan, and is one worth remembering. You will observe the camera pointed toward three brilliantly illuminated windows.

### AMATEURS AND EXHIBITIONS.

BY C. BRANGWIN BARNES.

"WHAT is an amateur?" is a question that has been oftentimes propounded, and oftentimes answered, but rarely, if ever, to the complete satisfaction of all parties concerned. In questions of rowing, running, boxing, bicycling, and in athletics generally, it is now laid down as a hard-and-fast rule that "an amateur is one who has never competed for a money prize nor against a professional, nor has received money in return for his services." Such being the case with amateurs generally, the query that naturally presents itself to us is, what is an amateur photographer? As usual, in the case of such a query as this, many others arise from it. If an amateur is a person who has never competed for a money prize, how about those ladies and gentlemen who exhibited samples of photographic work at a recent exhibition where many of the prizes were paid in coin of the realm? Are they henceforth to be enrolled as professionals? I opine they are not, for I cannot see that, when amateur competes against amateur, wherein lies the difference in competing for a medal, a cup, or for kudos. True, the medal or the cup may be looked upon as better worth the winning from a purely amateur point of view, whereas a money prize is, undoubtedly, of much

more use. In the event of professionals—that is, persons who habitually work at the art science for the purpose of making a livelihood—being engaged in the competition, there is a decided difference, although I cannot see that even in that case the competitor should forfeit his claim to the title of amateur.

In the third or final definition of the title, as I take it, lies the whole root and branch thereof. If we say that an amateur athlete, or an amateur theatrical or singer, is one who has never been paid for his services, I think we shall have a fair definition of an amateur in general, including, for the purposes of the present article, the amateur photographer in particular. According to this rendering an amateur photographer is a gentleman (or lady) who from pure love of the art, or to fill up spare time, or for, perhaps, a hundred and one minor reasons, chooses to take photographs of any kind of subjects whatsoever, without receiving any remuneration for so doing.

Amateurs have rendered great services to "the art science," and to its professional followers in many ways; that is to say, some amateurs have, and for that reason I would be one of the last to decry amateur photography as a whole. My contention is that when a photographer, ostensibly an amateur, enters into competition with a professional, he becomes one himself. When we see landscapes or photographs of celebrated buildings exposed openly for sale, and are told they are the work of an amateur, we must confess that in our opinion the producer is undoubtedly a professional. A case in point came under my own cognisance recently. A party of celebrities travelling for pleasure were photographed, and copies of the photographs were supplied to members of the party at a small charge, and yet, forsooth, the producer of those photographs—I might almost say the vendor of them—still rejoices in the title of amateur.

Not so very long since my opinion on this point was asked by a gentleman, who stated that he was in the habit of photographing his friends, and supplying them with copies at cost price. I unhesitatingly stated that by so doing he was no longer an amateur, and I am of opinion that if the point were pressed at an amateur exhibition I should be found to be in the right.

I like competition (what Englishman does not?); but I cannot, for the life of me, see why so-called amateurs should receive handicap allowances when competing with professionals. A person who studies an art and works at it has equal chances of progressing in that study, whether he pursues it for love or money; and why one should be handicapped in the competition because he makes his living out of it, is the question I desire to see debated and settled.

While on the subject of exhibitions I would ask, "Do the judges always inquire into the truth of assertions made with regard to exhibits by the exhibitor, or are their statements taken for granted?"

I have personally seen pictures exhibited, with the medal ticket attached, about which certain statements were made, which were (as Mr. Snagsby would say, "Not to put too fine a point on the matter") slight exaggerations of the truth. The statements in question made it appear that the pictures were taken under greater difficulties than was really the case, and would probably have some influence in the awarding of the medals.

In competitions amongst architects, and many other professions, it is the custom for the competition to be marked with a motto only, and the name and address of the competitor to be enclosed in a sealed envelope bearing the same motto on the outside. The award is then made without the judges being aware of whose productions they are examining, and when the selection has been made, and not until then, are the envelopes opened. Would not something of this kind be applicable to photographic exhibitions, and tend to remove many of those heart-burnings which always result from our exhibitions as they are at present held. Personally, I do not believe that there has

\* Read before the Amateur Society of Photographers of New York.



ever been an award made contrary to the genuine opinions of the judges making such award; but then I have never been an exhibitor, and as a mere on-looker I have been led to believe that all exhibitors, especially *unsuccessful* ones, do not seem to hold the same opinion. The motto system would take away the chance of collusion if such a thing ever existed, and we should have not only fewer complaints as to the justice of awards, but also as to even the hanging of pictures. Many exhibitors, whose pictures are either skied, floored, or popped into some obscure corner, are apt to think that their name being either unknown and obscure, or even obnoxious to the judges, has something to do with this, while in all probability the name has never been noticed prior to the hanging.

We usually find it a rule that no exhibitor's address is to be affixed to his exhibit; at the last exhibition of "the Photographic Society" this rule seemed to be altogether ignored, names and addresses being affixed in every direction. Had the motto system have been adopted prior to the award of medals, the names and addresses might have been added after, and there would have been no grumbling.

I would venture, merely as a suggestion to the promoters of photographic exhibitions in the future, for them to take or leave in whole or in part, as they like, that the motto system be adopted; that the hangers, or the superintendent of the hanging, be not one of the judges; and that amateurs and professionals be placed on an equal footing. If an amateur exhibits the best work in any class, let him have the medal—"Honour to whom honour is due"; and if the judges are unaware to whom they are awarding prizes, none of them being competitors themselves, photographers in general, and unsuccessful competitors (both professional and amateur) in particular, will be better satisfied.

## Patent Intelligence.

### Applications for Letters Patent.

- 2,382. EDMUND PHIPPS, 4, Clayton Square, Liverpool, for "Improvements in photographic cameras."—Feb. 17, 1888.  
 2,417. CHARLES WELLS and RICHARD STOKES, 22, Southampton Buildings, Chancery Lane, W.C., for "Improvements in albums for photographs and the like."—Feb. 17, 1888.  
 2,474. FELIX DEACON BLACKBEE, Beethoven Villa, Harold Street, Camberwell, S.E., for "Working a photographic shutter by means of a pneumatic piston to be known as the 'Blackbee pneumatic shutter.'"—Feb. 20, 1888.  
 2,730. ALLRED JAMES, 76, Chancery Lane, London, W.C., for "Improvements in lamps for the rapid combustion of magnesium powder for photographic purposes."—Feb. 23, 1888.

Patent on which the Sixth Year's Renewal Fee has been Paid.

775 of 1882. R. T. WALL.—Photography.

## PHOTOGRAPHIC CONFERENCE OF THE CAMERA CLUB.

### PROGRAMME, FIRST DAY (TUESDAY, MARCH 13).

2 p.m.—Opening of conference in the Theatre, Society of Arts, 18, John Street, Adelphi, by the President, Captain W. de W. Abney, F.R.S. The following papers will be read and discussed:—Captain Abney, "Artificial Light in Photography"; J. Traill Taylor, "Single Lenses corrected for Architecture"; G. S. Waterlow, "Modern Photographic Engraving and Printing"; W. Willis, "A Recent Improvement in Platinotype"; J. F. Mostyn Clarke, "The Value of Present Art in Photography"; T. Dallmeyer, "On a Further Development and Simplification of the Standard of Comparative Exposures, proposed by Dallmeyer"; Sir D. Saloman, "Rapidity of Lenses (Photographic)."

2 p.m. to 5.30 p.m.—Exhibition of photographic apparatus in the Library, Society of Arts.

8 p.m.—Special lantern slide exhibition, in the Theatre, Society

of Arts. Exhibition of photographs by members at the Camera Club, 21, Bedford Street, Strand.

### PROGRAMME, SECOND DAY (WEDNESDAY, MARCH 14).

10 a.m.—Exhibition of apparatus in the Library, Society of Arts. Exhibition of photographs by members at the Camera Club, 21, Bedford Street, W.C.

2 p.m.—Renewal of Conference. The following papers will be read and discussed:—Captain Abney, "Theoretical Aspect of Orthochromatic Photography"; H. Trueman Wood, "Applications of Photography to Science"; Lyonel Clark, "The Metamorphoses of the Silver Image"; Andrew Pringle, "Centrifugal Separation in Emulsion Making"; G. Lindsay Johnson, "A Standard System of Weights and Measures"; W. F. Donkin, "A New Form of Sensitometer"; D. G. Thomson, "The Application of Photography to Medicine and Allied Sciences."

Photographers and others interested in the subjects under discussion are cordially invited to be present. The meetings are open to ladies.

## Correspondence.

### AMATEURS AND PROFESSIONALS.

SIR,—Although by it I am pointed at as the champion of uncharitableness, I am glad to see Mr. Constantine's letter in the NEWS (which I find is a trade journal), as here, he and I can let the trade judge for themselves whether there exist the objections to amateurs taking portraits for gain, even to benefit charities, which I have demurred to.

A fortnight since I had the indiscretion to draw the attention of the trade, by a letter in your journal, to Lord R. Grosvenor's scheme. I say indiscretion, for I am now told that amateurs alone have to settle the matter, and that professionals have nothing to do with it.

I must beg your readers to understand distinctly what my objection to Lord Grosvenor's scheme is, and what it is not.

I object to portrait taking, as I conceive it would militate against the interests of men in the trade, and, by creating jealousy, jeopardise the harmony now existing between the two classes. I do not object to amateurs doing all they can to aid any charitable purpose by work except portraiture, and in proof of this I quote my own words, published on January 27th, in that photographic journal in which Lord Grosvenor's letters have appeared. I wrote: "If amateurs will sell to their friends not only their spare prints, whether of landscape, figure, or any other subject, but will print from their negatives specially for the objects named, I am with them entirely, and should be only too glad to find customers for the prints I would offer; but if it be proposed that for this purpose amateurs should take portraits of their friends for fee, then I see immense injustice to those men who, as professionals, have invested their money, who give good value to the public in supplying their wants, and who, as a rule, know too well how difficult competition with each other has made the production of good yearly balance-sheets." I complain that neither by Mr. Constantine, or any other of my opponents, has this declaration of mine been alluded to.

After reading Mr. Constantine's letter in your issue today, in which he would make it appear portraiture is not contemplated; your trade readers, who I find never see the amateur journal in which it appeared, will be surprised to learn that on January 13th he wrote thus, in connexion with Lord Grosvenor's project:—"He (the amateur) possesses the knowledge necessary for taking pictures of his acquaintance, their children, and their pets, and, armed with the membership of such an association as Lord Grosvenor suggests, could boldly make a charge for his work without any danger of personal or mercenary motive being imputed." He then suggests an enlargement of Lord Grosvenor's scheme, foreshadows Royal patronage, president, officers, and even a distinguishing



badge to be worn by each member. To this letter Lord Grosvenor adverted in another which appears January 20th, in the same journal (*Amateur Photographer*), and in this he not only indorses Mr. Constantine's views, but seems enraptured by them. He talks about hospital branches; asks who should be the first president, and winds up thus: "How I long to see the association afloat. When once the president is elected, the smaller branches will soon spring out, and we shall see the day when amateur photographers will be raising hospitals and orphanages from the profits of their own work." Now if, in all this, there had been one word of, "Don't let us injure the tradesman by what we do," I would have uttered no word on the subject.

No one, after reading Mr. Constantine's letters, can doubt the sincerity of his convictions, or the worthiness of his motives; but he must permit me to tell him he knows little about a professional photographer's business. Like Lord R. Grosvenor, he points to high-class work, asks who else can do it, and pool-pools my statements. He ignores entirely the hundreds of men who feed their children by doing common, cheap work only; but worse than even this, he seems ignorant of the fact that in every large town are many men who turn out the splendid work he alludes to, and who foster a supplementary trade in cartes at six and cabinets at ten shillings a dozen. These are good, honest, untouched photographs, on cheap mounts, but rolled, and of excellent value, yet they can be matched, or nearly so, by hundreds of amateurs at the present day. This has been imposed on traders, who no longer can afford to stick out for our class of work only. I enquire not why, but I fear amateurism has been a factor in bringing it about. I firmly believe that what I say applies to seven-tenths of the better class of provincial photographers. These are men who, if current influences are enlarged, may half of them put up the shutters and mark the house "To let." They are the men with whom I have sympathy, and who, I say, deserve better things at the hands of amateurs than are awarded to them.

The value of your space, sir, forbids me to enlarge this letter, or I would tell who take establishments wholesale, and in detail; who the governess, who the young nurse, who the housemaid, who the gardener, who the daughter, and who the babies. I could, I think, show that so much is already being done that, proportionately, less is required at the hands of the trader. I should also like a word about that collie, and that house. A few years ago a professional would have been called in. Both subjects are, or were, ordinary professional work. To-day, I like Mr. Constantine, might have complied with the request to take them; but, as is my custom, I would have refused prints; I would have referred my friend, as I do even a very near relative, to a little photographer to whom I lend any negative I take to print from, and sell copies to him at a very reasonable price. By that means I would benefit, instead of injure, a poor hard-working trader, who would have been glad to have done all himself, but who is grateful for half.—I am, yours, &c.,

WILLIAM ADCOCK.

Melton Mowbray, Feb. 24th.

#### THE LONDON AND PROVINCIAL ASSOCIATION.

SIR,—Will you allow me to correct in your report of my late "Discourse" addressed to the L. and P. P. A., a few errors which might lead to misunderstanding. I blame myself for confused manner of delivery rather than your reporter for inaccurate reporting. As I have hardly ever in London given vent to a sentiment that has been accurately reported, I am forced to suspect that either my ideas are confused, my language obscure, or my dialect too uncouth to be "understood" of the reporters.

"The plates he used," you report, "were what would be called slow." Well, if 23 to 25 on Warnerke's sensitometer can be called "slow," the report is correct. I said there

was a difficulty in getting plates at once highly sensitive and sufficiently dense, but I said that such plates can be got. I can get them in the open market, and would name the maker, but for a rule I have never to name makers of plates when I can help it.

"Amplification," says your report, "he had not found satisfactory if 850 diameters were exceeded." What I really said was: "Direct amplification in my experience cannot satisfactorily be carried beyond 10 times the initial power of the object-glass used; for instance, with a  $\frac{1}{2}$ -th I cannot get more than  $\times 850$  by any means direct without loss of sharpness."

"Focussing was effected by a brass rod acting by means of a band upon the fine adjustment screw." I stated particularly that though this is perhaps the best, and certainly a good plan, I use a Hooke's (or Hook's) joint attached by a spiral spring to the fine adjustment screws.

In my contribution to the after-discussion, you make me say that the colour fringes due to imperfect achromatisation are not seen—"do not hold good"—with an "achromatic" lens. For "achromatic" read "apochromatic," and even that remark I made with a reservation.

Your contemporary, the *British*, also reported me in some particulars amiss, as I think. I am glad to say that what he has wrong, you have right; and what you have wrong, he has right. This leads me to hope that perhaps the fault is not with me after all. ANDREW PRINGLE.

Bexley Heath, S.E.

SIR,—I was not aware until quite recently that my somewhat impromptu discourse, delivered at the meeting of the London and Provincial Photographic Association held at Masons' Hall Tavern on the 9th inst., had been reported in the Press, but finding such was the case I referred to-day to the notice on page 110 of your issue of the 17th inst., and shall be pleased if you will allow me to draw attention to an apparent paradox. In my reply I am stated to say that neither dry nor wet silver chloride re-absorbs chlorine evolved under the influence of light, although earlier in the evening I had made a statement to the contrary. This is the real state of affairs: the chloride, when quite wet, does not act in the manner described; but chloride dried in an air bath, and over sulphuric acid, does, and a tube that I still have becomes coloured in light, and white again in the dark. As, however, I have never tested it for moisture, I could not assert that it was absolutely dry, hence I suggested that possibly (not definitely) absolutely dry silver chloride would not behave in a similar manner, which, however, I will now test by experiment.

The warning with regard to silver fulminate, as it stands in the report, is scarcely complete; it should be borne in mind that this very dangerous substance is also produced when caustic potash or soda is added to ammoniacal solutions of silver nitrate or chloride, and therefore such admixtures should always be avoided.—Yours faithfully,

D. A. LOUIS.

77, Shirland Gardens, W. Feb. 29th.

#### THE AMATEUR PHOTOGRAPHIC CHARITY ASSOCIATION.

DEAR SIR,—Will you permit me to assure our young friend Mr. Constantine (he must be young, there is an innocent lack of common sense in his letter which has the unmistakable perfume of the early spring of youth), that far from Mr. Adcock being an alarmist, there is unfortunately only too much truth in his statement of the harm the enthusiastic amateurs with a taste for economic charity are working the profession.

We used frequently to take good orders for bazaars, &c., but now we often find our pictures of local celebrities badly copied by the aforesaid charitable amateur, and sold at prices which tempt the impecunious public and spoil the



sale of good work which cannot be produced for the money these abominations are sold at. It is all very well to say copyright your pictures, but most probably the charitable amateur would plead infancy, and we cannot afford to make enemies of our local magnates.

The gratitude of Mr. Constantine to the profession for "the useful hints and valuable services so cheerfully and gratuitously rendered" is really most touching; in return he takes from us some of our best work. In the first place, the photographing of an old canine pet. Why, sir, there are many men would more cheerfully pay for this than for the portraits (no matter how good) of their mothers-in-law.

And, in the second place, a fellow's brand new house. A man never rests until he has had this photographed, and there are some abandoned wretches who prefer a picture of their new house even to a group of their last batch of twins. Such is the perversity of our poor imperfect human nature. So this graceful amateur takes, at his own computation, 15s. worth of work out of professional hands, and charitably hopes the loss may be multiplied a thousand times.

Let me, in conclusion, tell Mr. Constantine, Lord Grosvenor, &c., &c., a true story. Some time ago there was to be a bazaar in aid of the funds for providing gilt tops to the church railings, or a new confessional box for our parish protestant establishment, or something like that—I can't quite recall the exact object. However, the curate came to me, and asked me to lend him our negative ("the best ever taken of his vicar"), as he, being a charitable amateur, wanted to make a number of enlargements, and sell them at cost price. "The vicar would be so pleased," he said, and if the enlargements were a little under or over exposed it would not matter, as they would be so cheap.

I think the profession ought to be very grateful not so much to Mr. Constantine, but to Mr. Adcock for having the good sense and the good heart to draw attention to the "breakers ahead," which I am sorry to say are not "imaginary."

AUGUSTUS W. WILSON.

## Proceedings of Societies.

### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE usual monthly technical meeting of this Society took place on Tuesday last, the 28th of February; Capt. ABNEY, Vice-President, occupied the chair.

THE CHAIRMAN having called upon Howard Farmer to give his promised demonstration of "Silver and Gold Printing by Development," the latter said that before he demonstrated the method, he would say that Mr. Tompkins and himself had been struck by the fact that improvements had been made in the method of producing negatives, but that the method of silver printing remained the same as that in vogue forty years ago. In order to produce prints the photographer has sometimes to keep his customer three or four weeks. Most people would agree that this is at the present time a great drawback, and of the greatest detriment to the photographic business. Some time since it had occurred to Mr. Tompkins and to himself that whereas of developed images there were generally two kinds, one which gave a red image, but was apt to appear sunk in, or wanting in brilliancy, and another which might appear brilliant, but was cold in colour and did not tone readily with gold, they considered that there were two kinds of product upon which the light acted, and by using one and eliminating the other, they might succeed in getting a compound which would have the merit of both. They had succeeded in doing this with emulsions of silver chloride in various vehicles, amongst which he would mention—1st. An albumen emulsion, the prints on which, although produced by development, were absolutely identical with the albumen prints at present in general use. 2nd. A gelatine emulsion, the prints from which, though not identical with those on ordinary albumen paper, very strongly resembled them. 3rd. Collodion emulsion, in which again the prints strongly resembled those produced in the ordinary way.

The first process, that of albumen emulsion, was the one to which he proposed to devote the evening. They had chosen the title "Silver and Gold Printing by Development," as they found at the outset that well toned ordinary albumen prints contained quite as much gold as silver. Some prints, indeed, which he would show, consisted almost entirely of gold. Printing by development was of course not new. So long ago as the year 1853 Prof. Hardwich described several processes for the purpose with iodide of silver, &c. Wilkinson more recently gave formulae for silver printing by development, and several others had described gelatine emulsion papers, which with development gave photographic tones. They had carefully examined those processes with the following distinct results:—A. In no case could the same brilliancy of colour and tone be obtained as with an albumen print; also there was a certain amount of muddiness apparent, especially by reflected light. B. With a short exposure a fairly brilliant print could be obtained, but not having a photographic tone; on the other hand, with long exposures photographic tones could be obtained, but then there was a certain amount of muddiness and want of brilliancy. C. Even when red images were obtained in development, this colour changed in the fixing bath to a sort of mustard tone, not suited for gold toning, and the finished prints were not like ordinary silver prints. As to the first defect—want of brilliancy, or muddiness—one very curious fact that they had noticed was, that it was easy to get a brilliant colour by transmitted light, which, however, would not be at all so by reflected light. There was a plate made with collodion emulsion (shown) which gave almost the exact colour of an albumen print by transmitted light, but by reflected light was muddy and bad. The first explanation of the fact which had occurred to them was, that the reduced compound of silver was dichroic, a compound similar to that which formed the green fog of gelatine emulsion plates; but they had argued that an ordinary albumen print was equally red, by transmitted and by reflected light, and it therefore followed that a red colour was not necessarily a dichroic colour. The next explanation of this muddiness that suggested itself was, that the image was not sufficiently on the surface of the paper; it could easily be imagined that a developed image was more buried in the substance than a printed-out image. Experiments had not confirmed that view: muddiness did not ensue in proportion to the thickness of the sensitive coating. The third explanation which they had considered was, that muddiness was due to exposure to air or to the developer. To test this theory, they had coated glass and exposed it through the glass to the action of the light. As the muddiness showed just as strongly as before, although the image was not exposed to the air, or to the developing solution, except what was actually engaged in work, this theory had to be abandoned. The last explanation, and that which they believed to be the true one, was that there were two distinct actions going on, one giving a red, and the other a muddy image. First they noticed that the pictures were always red and free from muddiness at the beginning of the development. They also noticed that a long development gave muddiness by transmitted as well as by reflected light. Some restraining salts also prevented or delayed muddiness. Again, short exposure tended to produce bright images. As regards the third defect, that of loss of redness by a change into yellowness in the fixing bath, they had found that the less the exposure that could be given consistent with redness of image, the less change there was in fixing. They had tried various salts of silver, and found that with haloid salts the red colour could always be deepened upon. They had also noticed that the silver chloride would give a red colour independent of the state of division, whether or not it was emulsified, until it reached the coarse state. Silver phosphate gave a pleasanter sepia colour, but darkened all over in the dark, and fogged even without a developer. Silver phosphate also was not fixed out by hypo, but was by ammonia. Silver carbonate gave fog. Various developers were tried. They had not found that the developer had much action upon the colour of the image. The strength of the developer was more important. At a temperature of 37° Fahrenheit, or less, development almost ceased. Various restrainers were tried. They found generally that the greater the amount of restrainer, the redder was the colour. Whatever was the kind of restrainer, the colour was practically the same. Various solutions were employed in which to emulsify, but the difference of result was not great. Gelatine, however, gave much more sensitive emulsions than any other substance. Coloured light had no distinct action upon the colour obtained on development.



Prints exposed merely, and exposed and developed, were handed round; and the demonstrator proceeded to develop some prints which had been previously exposed to daylight under negatives. Before placing the prints in the developing solution, they were immersed for a few minutes in water, so that they might become quite homogeneous and take the developer evenly. The developer used was, the demonstrator said, the very beautiful one, hydrokinone, given by the chairman of the meeting, Captain Abney. There were no special advantages for this process of this particular developer, except that of cleanliness and freedom from introducing extraneous substances such as oxalate of lime. The strength of developer was adjusted so as to require four or five minutes for its action; it was then well under control.

G. L. ADDENBROOKE inquired whether there was the same tendency to finger marks that he had found with a certain commercial paper.

H. FARMER replied that it was quite free from finger marks. The exposure should be such that nearly all details are just visible before development. They considered that important. It allowed the printer to judge correctly of the exposure. The prints then shown had been exposed by daylight at an ordinary window, for periods of from four or five seconds up to one minute. Attention was particularly called to the statement that the prints had exactly the same appearance as those on ordinary albumenised paper. Prints upon a mat surface, and of black tone, were also shown, along with some platinum prints; and the demonstrator thought that it would be difficult to discover which was which. In conclusion, he thought that the emulsion process in printing would produce as many advantages as it had done in negative taking.

W. F. DONKIN enquired whether the image was reduced in the fixing, so that the print must be developed darker than intended to remain.

It was answered that the prints did not become reduced in the hypo, but were developed of the strength they were desired to be.

The CHAIRMAN said that Mr. Farmer had stated that the image was exactly the same as that of an ordinary print. What was the ground for that statement? In an ordinary print they had to do with chloride and albuminate of silver.

H. FARMER believed that his prints were more permanent than ordinary silver prints. They did not bleach with sulphuretted hydrogen.

The CHAIRMAN remarked that the image was not quite the same. He thought they must go back to the original laws of physics. We could have silver in certainly two states, the blue, and the red. The red molecular silver depended not upon fineness of sub-division. His idea was that when chloride of silver was red the particles were more separated. Both kinds could be prepared in the laboratory in large quantities.

W. COBB enquired whether any special kind of negative was required.

H. FARMER replied that it was not, but that negatives which were either too weak or too intense for ordinary printing would, with this process, by modifying the treatment, yield good results.

S. G. ADDENBROOKE enquired as to the keeping quality of the paper.

It was replied that some had been kept for three months without change.

After a vote of thanks had been passed, a flash lamp for burning magnesium powder was shown. In this lamp the powder was blown up through an Argand burner. The duration of the flash was thought to be too long, and a considerable quantity of the magnesium escaped unburnt, and fell upon the table on which the lamp was placed.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The usual weekly meeting was held on the 23rd inst.; J. HUBERT occupied the chair.

L. MEDLAND exhibited another form of flashing apparatus; it was simply a short length of metal tube; to one end is attached a pneumatic tube, the charge of magnesium powder being inserted just within the opposite end of the metal barrel; a piece of absorbent material, fixed by a piece of wire and dipped into methylated spirit, furnished the flame for combustion.

The CHAIRMAN thought the room in which portraits were taken by this kind of light should be well illuminated; it would lessen the tendency of the sitter to close the eyes at the instant of exposure.

At a previous meeting, it was decided to have an exhibition of hand-painted slides, that members might have an opportunity of comparing the best work of the past for the optical lantern with that of the present day. This being a lantern night, opportunity was taken to carry this resolution into effect, and a large collection of hand-painted transparencies were exhibited and projected on the screen. They were of a very varied character, subject as well as style, and comprised some of the best productions of past masters in the art of slide painting. The exhibition of these transparencies occupied the remainder of the evening. Messrs. Westley and Carpenter, and Messrs. Perkin, Son, and Rayment, were the exhibitors, to whom a hearty vote of thanks was passed for the loan of such an interesting collection of slides.

G. Moore and Henry Park were elected members of the Association.

#### CAMERA CLUB.

On Thursday, Feb. 23rd, the monthly lantern slide exhibition was given. There was a very varied show of work. Henry Stevens contributed a series of his lantern transparencies, the subjects being home portraiture and groups, and particularly studies of choice flowers and plants. The prints were very fine in colour and quality, and were upon Mawson's lantern plate.

F. GALE showed some of his wet collodion slides, the subjects being pure landscape and landscape with figures.

Some good sets of slides were also shown by Messrs. Green, Barclay, and Howlett, and a selection from the American Exchange slides was put through the lantern.

On Thursday, March 8th, the subject will be "Detective Cameras," by A. R. Dresser.

#### BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The ordinary meeting of the above Society was held at the Technical Schools, Bridge Street, on Feb. 23rd, E. H. JAKES (Vice-President) in the chair.

J. PLACE gave a very practical paper on "The Lantern (Oxy-hydrogen), and how to use it," showing a number of different lanterns, and explaining the various kinds of jets and lights used formerly and up to recent date, afterwards giving an exhibition of slides by the members, also some very fine slides by York, Wilson, and Valentine. Instead of the usual gas bags, he used compressed gas at about 2000 lbs. (slb. square inch) pressure, in steel cylinders, which produced a very intense, uniform, and brilliant light.

The paper on March 8th will be "The Land of the Midnight Sun," by E. H. Jakes.

#### BRISTOL CAMERA SOCIETY.

At a meeting held on the 9 inst., F. HOLMES in the chair, E. F. BOND read a paper entitled "Monochrome Effects in Lantern Slides."

Mr. BOND said the question which was the root of all the remarks he might have to make that evening was, "How can I obtain the best effect in my lantern transparencies with the least expenditure of time?" To answer this question was the task he had undertaken to perform in their company. He considered the colour of a slide, under ordinary treatment, to be cold and uninteresting, varying (according to development) from a greenish blue to reddish brown, whilst the effect produced by applying oil or water-colour was, in many instances, anything but pleasing to the eye, although when carefully and artistically manipulated, the result was not to be approached by any other method. Proceeding to describe his mode of working, he preferred to use slides developed with ferrons oxalate, which, after fixing and thorough washing, were soaked in a solution of sulphate of soda and sulphuric acid, after which a solution of uranic nitrate, potassium ferricyanide, and methylated spirit was flowed over it, the action being clean and quick—the silver deposit on the plate becoming first brown-black, then full chocolate-brown, next reddish brown, and lastly a tawny yellow; this latter stage, however, is not a desirable one. To avoid it the plate should be removed from the solution whilst of a reddish-brown tint, thus obtaining a sunny effect, whilst a moonlight effect was gained by immersing the plate in a solution of sulphate of iron and potassium ferricyanide. A good purple-brown was obtained by mixing sulphate of iron with uranic. A large number of successfully coloured slides illustrated the above and other methods, by which a great variety of effects in monochrome colouring were exhibited by



means of the lime-light lantern. The lecturer, in concluding, expressed a desire that others should continue the experiments he had commenced, saying he should feel delighted if they could penetrate further into the paths which he had cleared for a short distance.

The CHAIRMAN in the course of his remarks spoke of the carbon process as capable of yielding all that Mr. Bond claimed for bromide or chloride plates, but inasmuch as the carbon process was not so familiar to members, he strongly advised them to carry out the desire expressed, and build on the foundation laid in the instructive lecture to which they had listened.

#### CHELTEMHAM PHOTOGRAPHIC SOCIETY.

A MEETING was held on February 9th, the President, General Dawson, C.B., in the chair.

Mr. JOYNER showed a "carte" containing six images of the moon which he had taken during the recent eclipse with a 12-inch focus lens. Each image illustrated a different phase of the moon during the time the earth's shadow was passing over it, and was  $\frac{1}{8}$  inch in diameter. Although the detail was not perfectly sharp, the images were considered very good. In connection with this subject Mr. Joyner explained how he took an enlarged image of the sun, 8-inches in diameter, during the transit of Venus a few years ago. Having darkened his enlarging room, the window of which faced the sun, he placed a 6-inch focus lens in the opening usually occupied by the negative, but instead of the sun on to the screen direct from that lens, he took it up with another lens of 6-inch focus, and with that one threw an enlarged image on the sensitive plate placed at a sufficient distance behind to the size required.

Mr. BULL exhibited an orthopanactic lens by Newton.

Mr. SADLER exhibited a very cheap and good long focus camera by Brown of Birmingham, which every one present considered a marvel at the price.

The HON. SECRETARY showed a very light and compact plate camera of his own making. It was constructed of white metal, and was something after the model of the old Kinnear camera, but with a reversing back.

#### NORTH LONDON PHOTOGRAPHIC SOCIETY.

AN ordinary meeting was held on Tuesday, February 21st, Mr. TRAILL TAYLOR in the chair.

G. Cartland was elected as an honorary member, and J. T. Carletti, G. J. Clarke, and G. Hayward, were elected as ordinary members.

After reading a short paper on "The Early History of Hypo Eliminators," F. W. Hart proceeded to demonstrate the action of the one which he had found most useful. He commenced by showing the action of the well-known iodide of starch test or the presence of hyposulphite of soda. He immersed the test papers in a weak hyposulphite solution, and also in plain water, and then added sufficient of the eliminator to render the hypo solution incapable of discharging the blue colour of the paper. The reaction was further demonstrated by test-tube experiments with the hyposulphites of soda and silver in solution, and Mr. Hart explained that the hypochlorite of soda used as an eliminator converted hyposulphite of silver into sulphate of silver, which was then attacked by the free chlorine in the eliminator, forming chloride of silver, which was soluble in a solution of ammonia and common salt, in which the print was immersed, the final washing removing all traces of the objectionable salts.

The PRESIDENT asked Mr. Hart whether the ammonia solution would not also dissolve some of the organic salts forming the image.

Mr. HART replied that ammonia was a solvent of the albuminate of silver, but that he doubted whether the weak solution in question would exercise any reducing action. He also referred to Dr. Angus Smith's method of eliminating hypo with peroxide of hydrogen, but said that he did not consider it equal to the hypochlorite. The peroxide was acted upon by any readily oxidisable substance, besides the hyposulphites. He would add, however, that even the hypochlorite solution required careful preparation; many had condemned the process when their failure was really due to careless manipulation.

Several members having expressed a doubt as to the destroying powers of hyposulphite of soda, *per se*,

Mr. HART said that it was comparatively harmless so long as

the print was kept dry and away from any other substance likely to set up an action between it and the silver image, but an acid or hygroscopic mountant or mount would almost infallibly result in the destruction of an imperfectly washed print.

The PRESIDENT said that in the Daguerreotype days a very beautiful process of fixing was introduced. The coating of iodide of silver was simply dissolved by galvanic action; the Daguerreotype picture was immersed in a vessel filled with a solution of common salt in which was suspended a zinc plate. The unaltered iodide was instantly dissolved on establishing connexion between the two elements. He thought it would be interesting to try whether a similar effect could be obtained by some analogous means with a silver print in place of the Daguerreotype plate.

E. CLIFTON doubted whether there was sufficient metal in a silver print to cause it to act as an element in a battery, and if it was attached to a copper plate the galvanic action would probably go on without affecting the chloride of silver in the paper. Besides, the electrical method did not provide for the removal of the organic salts of silver.

A. MACKIE asked Mr. Hart if he could explain the great change which was caused in the colour of an untoued print by immersion in a solution of common salt.

Mr. HART said that a silver print consisted of two different salts of silver, the chloride and an organic salt, formed by combination with the albumen. The latter was of a red colour, while the chloride had a more violet tint. His idea was that the chloride was more or less dissolved or broken up by the salt, leaving the organic salt, with its characteristic red colour, to form the image. A print so treated took longer to tone, and required more gold. He preferred in his own practice to leave a little free nitrate in the paper to start the action of the toning bath. Mr. Hart then exhibited a further development of the magnesium flash lamp. By a very simple contrivance he fired three flashes simultaneously about a yard distant from each other. He said that any number could be so fired, so that it would be easy to photograph the interior of a large building filled with people in motion.

The PRESIDENT announced that at the meeting on March 6th there would be an exhibition of hand-painted and hand-coloured lantern slides, to which visitors are invited; and at the meeting on March 20th there would be an informal exhibition of photographs taken by members.

#### LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting was held on Thursday, the 23rd ultimo, at the Royal Institution, B. J. SAYCE in the chair.

G. B. A. Gibbons, Dr. Edward Hewer, and J. M. Irvine, Charles J. McEwen, Charles J. Remfry, and Edward White, were elected.

The CHAIRMAN announced that the exhibition, which is to be opened at the Walker Art Gallery on Saturday, March 3, by the Mayor of Liverpool, was likely to be a most successful undertaking, so much space having been applied for that it has become necessary to enlarge the original scheme and secure an additional room. Enthusiastic promises of support had been received from all parts, and it only needed the hearty co-operation of every member of the Association whilst it remained open to be an unqualified success.

A. W. BEER mentioned that there would be lantern slide exhibitions every evening, and particularly called attention to the public judging of the lantern slides, which was fixed for Thursday, March 8.

The HON. SECRETARY read a letter from the Hon. Treasurer of the Boston Camera Club, U.S.A., proposing an exchange of lantern slides on a novel plan. The writer thought that there was a certain lack of interest in many exchanges for want of information as to the places illustrated and the absence of any definite connexion between the slides. He suggested an exchange with an English club upon the basis of each furnishing sixty to eighty slides of its own city and neighbourhood, each accompanied by a written descriptive lecture, which should be read as the slides were exhibited.

Some discussion took place upon the proposal, which was not, however, definitely accepted.

P. LANGE exhibited an enlargement of a view of the recent eclipse of the moon taken by his camera on a studio stand by means of the front combination of a Ross' half-plate rapid symmetrical lens, aperture  $f/8$  (which would be virtually  $f/11$ ), also lantern slides from the same negatives. He also showed two



groups taken by the magnesium flash light, and a remarkable photograph of a building in Montreal at which a fire had taken place, showing the intense effect of the frost there upon the water used for its extinction.

W. ROGERS showed two Wray lenses with the new iris diaphragm, which was much admired.

W. TOMKINSON then read his paper on "A Ten Days' Trip in Norway by the Steamship *Sunniva*," illustrated by limelight transparencies. The party proceeded first to Bergen, then to Vossevangen and Gudvangen, sailing down the Sogne Fjord, thence to Molde and Romsdal, to Trondhjem, and the Geiranger Fjord. All these places were illustrated by lantern slides and an interesting descriptive account.

The PRESIDENT called attention to the usefulness of lantern exhibitions in general, and urged on the members the desirability of further contributions of illustrated papers describing the scenes exhibited.

Mr. MAYNE, Hon. Secretary of the Exhibition Committee, announced that the judges were C. W. Hastings and Lyonel Clark, of London; George Webster, F.C.S., Chester; Rev. J. H. Palmer, M.A., Ashton; and Mr. Syce, President of the Liverpool Association.

#### PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

At a meeting of the Society held February 1st,

Dr. CHAS. L. MITCHELL read a paper entitled "A Neglected Method of Silver Printing" (see p. 135), and showed in connection with it some very fine specimens of prints upon plain paper. A discussion following relative to the merits of a combined fixing and toning bath for such prints.

JOHN C. BROWNE stated that while he did not altogether approve of such a method, he had in his possession some prints made and treated in that way in the year 1856, and that they are apparently as good now as when new.

J. C. BROWNE called attention to the danger in the use of some of the makes of flash powders for photography at night; containing, at times, chlorate of potash, sugar, nitrate of potash, bichromate of potash, and picric acid, in addition to the magnesium, the result was a highly dangerous explosive compound. Several members thought that the fumes arising from the combustion were irritating, and might be injurious.

Dr. MITCHELL did not regard the smoke as a source of danger, the visible portion being principally calcined magnesia.

L. CARBUTT and Mr. BARTLETT stated that their powders were very simple in composition, and entirely free from danger if properly used. The powder should be fired by a long taper from the side, or by an automatic arrangement, so as to insure the hand of the operator to be at a safe distance.

### Talk in the Studio.

FIRE AT THE EASTMAN CO.'S WORKS.—A fire which took place in the factory at Rochester, N.Y., on the morning of Feb. 10th only partially puts the Company out of working order, the camera and roll-holder factory, being separate from the paper works, being uninjured. The bromide paper works, in which building the fire occurred, is in shape for immediate erection of new machinery. The work of reinstallation in the bromide paper works has already been commenced, and new coating machines, which are partially completed, are expected to be in operation in a very short time. A circular says:—"In the meantime we have saved quite a large stock of coated paper, which we hope will, on careful test, be found uninjured, and in some sizes we may have enough to meet the actual needs of our customers, until we are able to get our new machinery in operation. Until then we trust our customers will assist us what they can, by ordering only for actual needs, and with their indulgence where we cannot fill their orders complete. They may be assured of every effort being strained for the early resumption of work."

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—On the 8th inst. a smoking concert will take place. Friends and members are invited.

PHOTOGRAPHIC CLUB.—The subject for discussion on March 7th will be "The Prevention and Cure of Stains on Gelatine Negatives."

### To Correspondents.

B. J. EDWARDS & Co.—Again we must draw a line as to the latitude allowed you in the introduction of personal abuse and insult having no bearing whatever upon the points under discussion, and we decline to publish any portion of the last paragraph of your letter; but if you will authorise us to excise this remainder shall appear. Those understanding the matter do not need such long letters in discussions, while those who do not are almost certain to judge against you on the ground that he who has a good case seldom takes up a personally offensive tone.

J. B. WHITAKER.—If sent for review they will be noticed in accordance with our view of their merits or demerits.

PRO.—Careless handling, by which the prints have become contaminated with hypo, before the immersion into the fixing bath.

WM. ADCOCK.—Thank you for the option as to making the verbal alterations in your letter. We have, however, left it in its original state. We really think there is much improvement of late as regards the subject of your remarks.

J. CARPENTER.—The first is a common French lens sold here under not very creditable representations; but the second is, we believe, to be depended on as excellent. If you get a fresh instrument we would suggest one of about 8 inches focus, and of either of the English makers whom you mention.

NITRATE OF SILVER.—1. There is a mistake in the figure; it should be 175 grains, not 75. 2. Write to the author, care of his publishers.

POL. TH.—Judging from the prints, both lenses are very good ones, but we think that the instrument of shorter focus will be by far the more generally useful to you; should you want a long-focus lens, and absolutely straight lines are not essential, use one combination of it. It is an excellent plan to get lenses on approval, and we think you will do quite as well by keeping the instrument you have in your hands (that of shorter focus) as by going to one of the makers whom you mention. What is generally understood as "depth of focus" depends mainly on the focal length of the lens, and in relation to two positions in the scene referred to in your letter, and a given situation of the camera, you get less "depth of focus," as the focal length of your instrument is greater, and it does not follow from your experiment that the long-focus lens is inferior in quality to the other. 3. It is a very convenient tray, and the absence of the plating will work no mischief, provided all is kept clean; still, you might easily adapt the "lift" to an ebonite tray.

R. WATMAN.—Black india-rubber cloth—india-rubber spread on silk, if you can get it.

WOLF BLAND.—We have not got his present address.

D. BEATTIE and D. J. LEWIS.—May we publish the essential portions of your letters? We believe publication will be beneficial. Other letters of a similar nature have been received.

M. R. S.—We have not yet heard of the publication of the new edition, although we are under the impression that great part, or the whole, is printed.

W. CURTIS.—1. Neither. Order the stamped form from the nearest post-office, and post them to the Patent Office. 2. It is illegal to import foreign articles in infringement, and you have legal remedy against any person using or selling such articles.

H. S. Y.—From the Eastman Co., 13, Soho Square.

Q. G.—Medium size and flat form.

J. M.—We think duty would be charged, but cannot give exact information. Write to the American Consulate in London.

JACK RUSSEL.—1. The book was printed privately, and we do not think it can be bought. 2. The address is 16, Cross Street, Hutton Garden, London. 3. Yes.

F. W. BURFORD.—The firm is quite a respectable one, and we take it that there must have been some postal miscarriage. We can hardly undertake correspondence which you can do so much better, as you know more about the circumstances.

### The Photographic News.

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For Advertisement Scale see page v.



# THE PHOTOGRAPHIC NEWS.

Vol. XXXII. No. 1540.—*March 9, 1888.*

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## PHOTOGRAPHERS IN CONFERENCE.

### THE MEETINGS OF THE CAMERA CLUB AND OF THE PHOTOGRAPHIC CONVENTION.

THE first mentioned gathering takes place at the home of the Society of Arts on Tuesday next, March 13th, and lasts over the following Wednesday; while the second takes place at Birmingham, commencing on July 23rd, and lasting for a week.

We may again give the leading items of information as to the London meeting of next week, and we have little doubt as to the interesting and representative nature of the exhibition of objects of photographic interest which will take place in the library, and we would insist on the need of making immediate application as to space, for which we understand there is no charge. The address of the Secretary of the Camera Club is 21, Bedford Street, Strand, W.C.

On the first day, Tuesday, March 13th, the opening of the Conference will take place in the Theatre, Society of Arts, 18, John Street, Adelphi, at 2 p.m., the President, Captain W. de W. Abney, in the chair. The following papers will be read and discussed:—"The Application of Photography to Medicine and Allied Sciences" (Dr. D. G. Thomson); "Applications of Photography to Science" (H. Trueman Wood); "Single Lenses corrected for Architecture" (J. Traill Taylor); "Modern Photographic Engraving and Printing" (G. S. Waterlow); "A Standard System of Weights and Measures" (G. Lindsay Johnson); "A Recent Improvement in Platinotype" (W. Willis); "The Present Value of Art in Photography" (J. F. Mostyn Clarke).

On the second day, Wednesday, March 13th, the Exhibition of Apparatus will open at 10 a.m., and at 2 p.m. the Conference will be renewed, and the following papers will be read and discussed:—"The Theoretical Aspect of Orthochromatic Photography" (Captain Abney); "The Metamorphoses of the Silver Image" (Lyonel Clark); "On a Further Development and Simplification of the Standard of Comparative Exposures proposed by Dallmeyer" (T. Dallmeyer); "On a Ratio Slide" (Sir David Salomons); "A New Form of Sensitometer" (W. F. Donkin); "Centrifugal Separation in Emulsion Making" (Andrew Fringle); "Artificial Light in Photography" (Captain Abney).

The Exhibition of Photographic Appliances will be open in the Library during the afternoon, and at 8 p.m. there will be a Special Lantern Slide Exhibition in the Theatre. It is hoped that ladies will attend, and there will be an Exhibition of Photographs by members at the Camera Club Rooms, 21, Bedford Street, W.C., to which they are also invited.

The Photographic Convention of the United Kingdom will be held at Birmingham on July 23rd next, and, as before stated, will extend over one week.

The arrangements during the week of convention will be similar to those at Derby and Glasgow, and a fully detailed programme will be ready shortly.

Only members of the Convention can exhibit at the Convention, and even these must pay for space; the following being the regulations for exhibitors:—

1. The exhibition shall form part of the convention meeting, and is not competitive in character.

2. The exhibition is intended to include every class of photographic work and apparatus; and exhibits are requested from any member, whether professional, amateur, manufacturer, or dealer. Members are requested to show anything of special photographic interest. All works sent will be subject to the approval of the exhibition committee.

3. Exhibitors will be charged the following rates:—Wall Space, 6d. per square foot; Floor Space, 5s. per square yard. Space will be allotted at the discretion of the committee; and Oxford frames will be excluded. Applications for space must be made on a form enclosed, which must be filled up not later than June 1st.

4. Exhibitors must be members of the convention.

5. The committee will be ready to receive exhibits on July 4th; last day for receiving, July 14th.

6. All packages to be addressed to Mr. S. J. Holliday, care of Mr. Porter, 153, Granville Street, Birmingham.

7. All packages to be sent carriage paid, or they will be refused; and exhibitors are requested, on forwarding goods, to advise the exhibition secretary, and to enclose addressed labels for the return of same.

8. Exhibitors are requested to attach to the backs of all exhibits, a label with name and address of sender, and title of exhibit written thereon. Intending exhibitors must apply to secretary of exhibition committee for official labels for this purpose.

9. For the convenience of exhibitors at a distance, the committee will unpack goods, and will repack and forward them after the meeting.

10. Local exhibitors must remove their exhibits on Saturday, July 28th, before 12 noon.

11. The committee will take all reasonable precautions, but they cannot undertake any responsibility for loss or damage.

12. That no exhibits be removed before the close of the exhibition.

The following places have been finally selected by the excursions sub-committee for the convention outings:—Tuesday—Arley, Stratford via Wexford, Stratford via Salford, Oxford; Wednesday—Coventry, Stoneleigh, Kenilworth and Coventry, Warwick, Worcester; Thursday—Aston, Sutton, and Lichfield, Lichfield and Sutton, Stratford, Coleskill, Maxstoke; Friday—Dudley, Wren's Nest, Shrewsbury, Worcester, Tewkesbury; Saturday—Kingswood and Duddesley. Each excursion will be conducted by an experienced leader. Times of starting, conveyance, fares, and other details will be duly published in the official programme. The evenings will, as heretofore, be devoted to the reading of papers, discussions, and demonstrations.

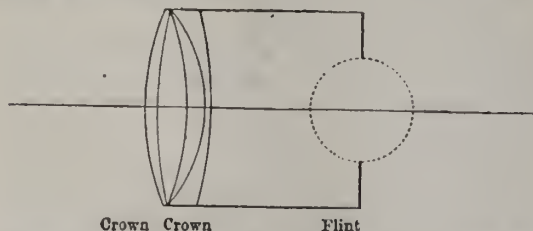


## DALLMEYER'S NEW RECTILINEAR LANDSCAPE LENS.

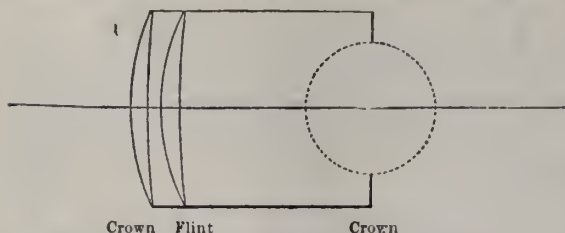
This instrument, to which we briefly referred on page 114 in our notice of the Crystal Palace Exhibition, is a departure of no small importance in photographic optics, and having now received an objective for review and trial, we are enabled to say more on the subject. The instrument sent is one having an equivalent focus of thirteen inches and a-half, and a diameter of two inches, while the largest stop is a trifle under an inch in diameter, making the maximum working aperture  $\frac{1}{16}$ . It effects a combination long desired by the out-door worker: the brilliancy of the old-fashioned single landscape lens, with the straight lines and portability of the rectilinear doublets which have come into such general use of late. We take it that every out-door photographer whose ideal is "the best that can be done," will obtain this instrument if he can afford it, and its introduction should have a perceptible effect in improving the clearness and brilliancy of architectural photographs.

Although it is specially constructed for views, it is excellently adapted for copying where straight lines are essential, and so can advantageously replace the rectilinear doublets, especially where extreme purity of image is an essential, as in the case of negatives intended for use in photolithographic processes.

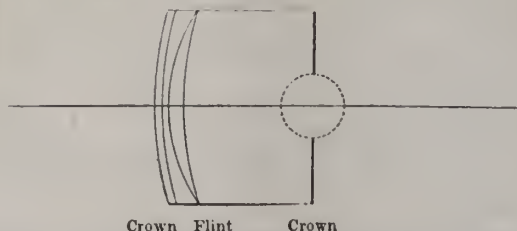
NEW RECTILINEAR LANDSCAPE, for 10 by 8. Focus 13½.



RAPID LANDSCAPE (Long Focus), for 10 by 8. Focus 15"



WIDE ANGLE LANDSCAPE, for 10 by 8. Focus 10".



It will be interesting to show in section each one of the three chief single landscape objectives introduced by Dallmeyer, each drawing being made to scale. Under each is specified the kind of glass used, the order of the significant words "crown" and "flint" being in each case the same as that of the glasses.

## WRAY'S RAPID RECTILINEAR WITH IRIS DIAPHRAGM.

ALTHOUGH the iris diaphragm as applied to the photographic objective is, in an absolute sense, by no means a novelty, it is only in the past few months that this

adaptation has become anything like general; and so thoroughly does the iris diaphragm appear now to be appreciated, that we think it not unlikely that before long the Waterhouse diaphragm, with its open slot and loose pieces, will be an organism of the past; and indeed, it may be that the somewhat clumsy and dust admitting rotating diaphragm will be competed out by the arrangement now so widely presented for public favour.

The iris diaphragm, however, stands in a certain danger, that of being brought into disrepute by cheap and ill-fitting workmanship; a rock upon which many an excellent device has shipwrecked in our present age of highly competitive production; but good fitting is the most notable characteristic of an iris diaphragm sent as part of a rapid rectilinear forwarded to us for review by W. Wray, of North Hill, Highgate, N., and in spite of this we find by the accompanying catalogue that the price of the instrument is as low as any but the very worst of the French instruments now so largely—and in spite of the Merchandise Marks Act—sold by fraudulent dealers as of English or American make.

The lens before us is a first-class instrument with a maxim intensity of  $\frac{f}{5.6}$  or No. 2 of the standard of the Photographic Society of Great Britain, and no optician, however great his reputation may be, need be ashamed of turning out such an optical instrument; while the mechanical construction of the diaphragm is so excellent that we feel wonder at the possibility of making the instrument at the price charged. The diaphragm consists of ten leaves set over towards the centre by the action of cam pins in the slotted leaves, the full range of  $\frac{f}{5.6}$  to  $\frac{f}{64}$  being obtained

by turning a milled disc through an angle of about 60°. And as a tribute to the excellence of the workmanship we may say that examination with a pocket magnifier revealed no sign of any fissure through which light or dust can enter, and no evidence of lost time in the moving of the leaves between the back and forward motion of the actuating disc.

## LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTION.

BY CHAPMAN JONES.

CHAPTER XX.—HALATION—SILVER PRINTING ON ALBUMENIZED PAPER—PRINTING WITH FERRIC SALTS—THE PLATINOTYPE PROCESS.

USING the word halation in its widest sense, it may be defined as the spreading of light beyond its proper boundaries in the image. It has been shown to be due to several causes, and the generally most potent of these is the reflection of the light that gets through the film from the back surface of the glass. This reflection may be largely reduced by "backing" the plate with a pigment that is black, or of non-actinic colour, such as red; or the passage of light though the film may be prevented by staining the film, or by having a sufficient amount of sensitive salt to render the film practically opaque. But the radical cure for this part of the evil is to get rid of the glass and use a non-transparent support, such as paper, for the sensitive film. The halation that remains when the reflection behind the film is prevented, is still visible in subjects specially liable to suffer from this evil, and is due to the spreading of the light on the front of the film. It is easy to point out two or three causes for this, though it is impossible to say certainly that the trouble is solely due to these causes. We know that the air contains innumerable particles, and that these are visible when a pencil of light shines through the air. The fact that the bright light makes them visible is proof that they reflect and scatter a part of the light that shines upon them. The effect of this scattered light is to produce fog



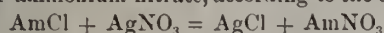
upon the plate round the proper image of the luminous object, and a fog that gradually decreases in density from the image of the light outwards.

But the lens itself is a source of scattered light, for the very best of lenses are not polished to such perfection as is necessary in a good telescope objective of large size, because such refinement would add to the expense, without giving any appreciable improvement—at least, in the vast majority of cases—in its performance in the camera. The imperfections of finish in a photographic lens are easily seen by holding the instrument between the eye and a candle or gas flame, and moving the lens to one side so that the flame just disappears. The lens will now appear luminous, showing that the irregularities of its surfaces are sufficiently numerous and great to reflect the light in stray directions in a manner similar to the motes in the sunbeam. The tendency of this imperfection of the lens is, probably, to give a uniform fog over the whole plate, rather than the local fog that is more immediately under discussion.

It is worth stating here that in 1863 J. H. Dallmeyer had an order from J. W. Osborne for the Melbourne Government to construct a photographic objective in which the lens surfaces were to be as perfectly polished as in the best large objectives of astronomical telescopes, and that the price agreed upon was £250, probably more than ten times the cost of the same lens as usually finished. The lens was for the copying of maps for reproduction by photo-lithography; but the writer does not know whether the instrument gave results which justified its large cost.

To bring to a conclusion these observations concerning the methods and the apparatus for producing negatives, it cannot be too vividly and persistently remembered by the photographer that a negative is only a means to an end, and has no beauty except inasmuch as it is able to furnish beautiful prints. To value a negative simply for its own sake is altogether unreasonable; and to call a negative good when it gives only an inferior print, is equivalent to praising an ornamental, but a useless, tool.

There are many methods of photographic printing, but the oldest of those methods that have ever been commercially important, and the process which still enjoys the largest share of popularity, is that in which the sensitive material consists of a layer of albumen which contains certain silver salts, and is supported on paper. The albumen is mixed with a certain proportion of ammonium chloride before the paper is coated with it, and, after the layer of albumen is dry, it is made sensitive by floating the paper on a solution of silver nitrate of a strength generally of from 35 to 50 grains to the ounce. The effect of the silver solution is manifold and somewhat obscure. It acts upon the ammonium chloride in the albumen, and changes it completely into silver chloride, with the simultaneous production of ammonium nitrate, according to the equation



The silver chloride is insoluble, and remains in the albumen film; the ammonium nitrate is soluble in the water, and passes out, as far as it has time, into the silver bath. The nitrate of silver also acts upon the albumen itself, producing an insoluble compound, the nature of which is but little understood. The production of this compound is, however, of vital importance, for if the albumen were not made insoluble it would be washed off the paper. The stronger the solution of silver nitrate employed, the more insoluble and less penetrable does the albumen become, so that a longer floating is necessary with a strong bath than with a weak one to ensure the thoroughness of its action. The excess of silver nitrate in the film, and the greater part of that which clings to the surface, also remains in the prepared paper, and in the ready sensitized paper now so largely used, citric acid or some other preservative is also introduced.

With such a complication it is not to be wondered at that the results are uncertain, and that the changes pro-

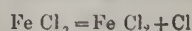
duced by light are but little understood. But add to this the need of toning to get an acceptable colour instead of a disagreeable red, and we find in this process, perhaps, the greatest number of scientific problems that even photography has ever brought together. It cannot be denied that the majority of prints made by this process are not stable; some last a month or two, some a year or two, a few are apparently unchanged after a decade or two, and still fewer have possibly lasted for a generation; but no one can with certainty say why this difference exists. Any hyposulphite of soda remaining in the print or gaining access to it seems an important element in its destruction. Yet the various methods that have been proposed for getting rid of the hypo do not seem to be appreciated. Dr. Vogel has strongly recommended the application of a weak solution of iodine after washing the prints in two or three waters, and before that Mr. W. H. Newton used acetate of lead, and Mr. John Spiller suggested peroxide of hydrogen. Other less suitable reagents have also been proposed. There is probably a tendency with any such treatment to mar the first brilliancy of the print; but experiments indicated that greater permanency was secured.

Looking at photographic printing from a scientific point of view, it would be far better to use the albumenized paper process for temporary proofs only, as mere tests of the effects of negatives, and to invariably resort to a permanent process for work that is to be preserved. By a permanent process we mean one in which the picture will last as long as the paper that supports it, the permanency being comparable with that of oil or water colour paintings, or impressions made in the usual sorts of printer's ink.

The behaviour of iron and chromium compounds when exposed to light is a matter that is far more easy of investigation than the changes resulting with silver compounds; the products are comparatively simple, and their further reactions are generally of a nature that is as perfectly understood as the commonest of chemical facts.

In such processes, therefore, the photographer may fairly expect the solution of any difficulties that arise by merely presenting the case to the chemist. If an immediate answer cannot be given, the matter is at once so narrowed down that a few properly conducted experiments decide the point.

In general, ferric salts when exposed to light in presence of a sensitizer are reduced to ferrous salts. For instance, ferric chloride loses chlorine and become ferrous chloride



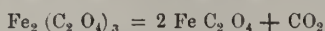
If a piece of paper is soaked in a solution of ferric chloride, dried in the dark, and then exposed under a negative, the ferric salt will be changed into the ferrous compound in proportion to the amount of light that has gained access to the paper—that is, in proportion to the transparency of the negative. A solution of red prussiate of potash produces a dark blue (like Prussian blue) insoluble compound with ferrous compounds, but not with ferric; if, therefore, the exposed paper is treated with this reagent, a blue picture is produced which only needs washing with water to “fix” it. Practically, ferric citrate is preferable to the chloride, and the double citrate of iron and ammonium is what is generally used. This salt is mixed with the red prussiate of potash before it is applied to the paper in making the blue printing paper of commerce, so that after exposure, nothing is needed but a thorough washing; but for brilliant results, the iron salt should be put on the paper, and the red prussiate of potash used in a dilute solution as a developer.

An image produced in a ferrous salt can be developed by other means. The ferrous salt will reduce nitrate of silver, and give a silver image, or chloride of gold with the production of a gold image, or by suitable means, a picture in platinum may be obtained.

The platinotype process which gives the picture in pure platinum is founded upon these reactions. The



paper is coated with a mixture of acid ferric oxalate, and the chloride of platinum that has the least chlorine possible. The platinum chloride is used in the form of the double chloride of platinum and potassium for the sake of convenience. When exposed to light the ferric oxalate is decomposed into ferrous oxalate and carbonic acid, thus:—



and this is the only change that will take place unless the exposure has been very slow. On floating the print on a hot bath of potassium oxalate, which dissolves the ferrous oxalate, the platinum salt is reduced, and metallic platinum is deposited in proportion to the ferrous oxalate. A print produced by merely following these directions would have a disagreeable muddy tone, and a general lack of brilliancy, with whites dirty and blacks degraded. To prevent these disasters several precautions are necessary. It is advisable to use a small quantity of some retarder—that is, some oxidising agent—with the platinum and iron salts that are used to coat the paper. The coated paper should not be kept more than two weeks, preferably not so long, before use. The development must take place in an acid bath of oxalate of potash. Acidity of the bath tends to hardness, and great care must be taken lest the bath be too acid. A bath of oxalate of potash that is allowed to remain alkaline may be the best to use, if there is sufficient acid or other retarder in the paper itself, because the development takes place so rapidly that the acid of the paper has not time to get washed away. The coated paper must be kept most carefully dry from the time it is coated till it is developed. Immediately after development the print should be thrust into dilute hydrochloric acid, and again into fresh acid, before washing with water.

The introduction of a very small proportion of certain other metallic salts, such as the chlorides of mercury or copper, exercises a very marked effect upon the colour of the deposited platinum, giving it a reddish tinge.

(To be continued.)

## A FIRST-CLASS OPERATOR.

BY C. BRANGWIN BARNES.

"A FIRST-CLASS OPERATOR!" Week by week, scarce, if ever, missing a Friday, does this phrase occur in the advertisement columns. First-class operators wanted, or, more often still, wanting situations. Perhaps it has struck others, as it often has myself, that we never see a second or third class operator either advertised for, or advertising his services. This must be due to one of two causes—either there are no second or third class men, or else their services are not required. The first hypothesis can hardly be the correct one, for, notwithstanding the improvements in the portraiture (photographic) of to day, as compared with that of fifteen or sixteen years ago, we do now and again come across a carte, or, may be, a cabinet, that has certainly not been produced by a first-class operator. It may be brought to us to copy, or we may meet with it in the album of a friend, or we may run across it in the showcase, or it may even be sent to us as a specimen of work in answer to one of those advertisers before mentioned; but, nevertheless, it is a certainty that it does exist, and as photographs do not evolve themselves, it is a certainty that there are existing somewhere operators who are, or whose work is, certainly not first-class. From these thoughts others rise, and with them various questions present themselves to our mind. First and foremost among these questions is, "What is a first-class operator?" "What are his duties?" "What his recompense?" Before one question can be answered, another crops up, or rather arises from the first. Let us not at present stay to question further, but rather endeavour to reply as best we can or may to the queries already propounded.

In the first place, what is a first-class operator? Is he necessarily a man of venerable appearance, who has spent long years of study in the profession—who has all the theories and the facts of chemistry, of optics, of light, shade, and perspective, of pose, balance, and composition, as it were, at his fingers' ends? Are all these absolute necessities, or can he dispense with a perfect knowledge of one or more of these subjects?

"Many men, many minds," runs the proverb, and the probability is that photographers, like doctors, being only mortal, will disagree in the answer to the query. It is, however, certain that to be, in the true sense of the word, a first-class operator, a knowledge of chemistry, in so far as it concerns photography, must be a necessity. To obtain first-class results, it is useless to go upon mere "rule of thumb;" in mixing chemicals certain quantities of each must be used, and these quantities differ under different circumstances. Unless we know *why* they differ, and what the result is going to be, we can obtain the best results only by accident. A man who obtains good pictures by accident cannot continue to do so, and although any tyro can learn in a few days that more pyro in development increases the density of the negative, that more ammonia increases the detail, that additional bromide stops too much detail, &c., he must not for an instant allow his chemical knowledge to stop there—he must seek out for himself the reason that such is the case; for although a little knowledge of effects may carry him on for a little while, he will at some time or other find that a little knowledge of causes is also necessary. Far be it from me to imply that the term first-class operator signifies first-class chemist as well; what I intend to convey is, that to be a first-class operator a man must have a certain amount of knowledge of chemistry; in other words, he must understand *thoroughly* the chemistry of photography. To understand this will need some little study, but the pursuance of that study is not likely to take up many years; it can be carried on at one and the same time as the study of optics; and coincident with that of posing, lighting, and composition. To become a skilled photographic operator is entirely a different thing to becoming a skilled chemist or a skilled optician, for to become either of these demands years of study of that one branch exclusively.

The study of photography, it is true, embraces chemistry, optics, and composition, but they need only be considered in so far as they relate to photography. An operator who understands how his lenses are made, and what compositions they contain, and at the same time is aware of the effect produced by these combinations, stands entirely on a different footing to one who knows only that a portrait lens differs from a landscape one in size, in depth of focus, and in rapidity, but has no knowledge of the why and the wherefore. A first-class operator knows at once why such and such a lens is better for a certain subject than such and such another one; whereas another man, who may be able to produce equally good work, merely knows that it is a better lens for the subject, but can in no wise explain or understand why such should be the case. Yet there are many operators who lay claim to being in the foremost ranks of their profession who have never given a single day's study to either the chemical or the optical side of the art by means of which they make their living.

As regards the artistic side of the question, however, no operator can claim to be first class unless he has studied the matter. It is quite possible to get along with no more knowledge of chemistry than bearing in memory the formula or instructions given with this brand of plates, or that brand of paper, or culled from a number of the YEAR-BOOK or PHOTOGRAPHIC NEWS, or with no more knowledge of optics than is conveyed in the very title of the lenses used. It requires no optical knowledge to know the difference between a portrait, a rectilinear, wide angle or group lens, and to utilize them for the subjects which



their titles signify. But as regards lighting, posing, and composition, the makers of the plates or of the lens can in no wise assist the operator; he must study and search out for himself how to light and how to pose his subject, and how to compose and balance his picture. It is true, the study of the masters, past and present, is of great aid to him, but it is none the less true that the lessons they convey and teach are not to be picked up at once. A mere cursory glance at a picture by Rubens, Vandyke, or Rembrandt, will not explain the lighting or the posing. Careful consideration is necessary, and this careful consideration occupies time. It has been said that operators, like painters, are born, not made; but I should very much like to see the operator or the painter who, without study, could produce good work. There is a vast difference between the work of an operator who has studied his profession, and that of one who has not. Both may produce equally good *photographs*, but a good *photograph* does not necessarily imply a good portrait or a good picture. A photograph may be perfectly unapproachable in its technical excellence, perfectly clean and clear and sharp, but it may at the same time be very far from perfect, either as a portrait or a picture. A perfect portrait should be a pleasing one; it is true that it may still be a portrait without having that effect, but it is here that the first-class operator comes in: he is a judge of human faces and of human anatomy; he sees what view of the face is the best, and which position is most suitable for the figure; he would not for an instant give way to the sitter who bought a portrait of some one else totally different in appearance and build to himself or herself, and requested to be taken in the same position. From this it will be seen that he also needs to be a man of the world, and able to convince his sitters that he knows better than they do themselves what is likely to suit them. It is not given to every operator to be able to do this, but if he fails he is still able to take his sitter in the position selected, and again in his own style, and the conviction he has been unable to drive home at the time of sitting is sure to find a resting place when the proofs are submitted.

The duties of a first-class operator vary according to the standing of the firm by whom he is engaged. I do not consider that any employer has a right to expect a first-class retoucher when he engages an operator, although we sometimes see such an advertisement as the following:—

OPERATOR, First-class, is open to Engagement, good Retoucher. Can colour in oil or water-colours, and work up in black and white. Would not object to manage a branch. Salary 25s.

The employer who gets this *multum in parvo*, this paragon of excellence, is perfectly welcome to him, as he will, in nine hundred and ninety-nine cases out of a thousand, turn out to be a "Jack of all trades, and master of none." The gentleman who advertises in this strain is usually a youth of 19 or 20, who has had two or three years' experience at most; and, if the truth were known, has, in all probability spent most of that time in a situation as assistant printer, but has kept his eyes open, and, with the ardour of youth, imagines himself quite capable of doing what he has seen done, and advertises accordingly. Many—in fact, most—operators are able to retouch to a certain extent, but it is very rarely that one is able to take a perfect negative, and retouch it as well as a retoucher who has made it his business to retouch only. Then it is very rarely that an operator has time enough to retouch his own negatives. Nothing is more annoying than to leave a negative half retouched, to go and take sitters who may prove exceptionally troublesome, and take up a considerable amount of time, at the termination of which the medium on the negative has become almost dry and unworkable, necessitating either that the work already done should be rubbed off by a fresh application of medium or increased labour, and a patchy result by completing the retouching on an unsuitable surface. If

an operator has not sufficient time for retouching, it is extremely improbable that he will have any to spare for colouring or working up.

As to the remuneration that is or should be received by a first-class operator, opinions seem to vary considerably, both amongst employers and employes; *i. e.*, if the before cited advertisements are, in any way to be accepted as a guide. First-class men are hardly likely to accept a salary such as mentioned, but yet we see them advertising for berths at salaries ranging from twenty shillings to four guineas per week, and employers offering the same scale. A few years since five guineas per week was not considered a very high salary for a first-class operator in any of the leading London houses, and I have heard of one firm at the present time paying their chief operator nine guineas per week. Taking the average all round, I think that four guineas or four pounds ten shillings would seem to be a fair salary for a really good and efficient man in a first-class London house. The best provincial houses pay from three to four guineas, and there may be one or two exceptions, say in Dublin or Manchester, where the London limit is reached and perhaps exceeded. A fair average salary for an average operator in London seems to be about three guineas, and when we consider what an operator needs to know, what his abilities must be, and the necessity for keeping up a good appearance, I do not think it can be said that even those who receive the highest salaries of all are at all overpaid.

## PHOTOGRAPHY BY ARTIFICIAL LIGHT.

BY J. F. ROBERTS.\*

WHEN our good secretary first insinuated that it was my duty to put before you a few remarks on the subject of Photography by Artificial Light, my feeling was one of amazement that I, whose experiments in this branch have been extremely limited, and have been confined in the main to theatrical work, and not much of that, should have been the individual selected to open a discussion on the subject.

This, I think, naturally divides itself into two branches, *viz.*, full exposures by gas or electric light, and shorter, or instantaneous, exposures by magnesium flash. Of the latter I propose to say nothing to-night, leaving it to be dealt with by other members who will follow me, and my remarks on the gas-light phase of the question will, therefore, of necessity occupy but a very few minutes of your time.

I am disposed to think, as regards artificial light work in general, that its importance has been much exaggerated of late, and that it contains little, at all events to the amateur, of practical value beyond the interest of the subject as an experiment, and as showing what it is possible to do in those cases where daylight is absolutely not available. But what are those cases? I think very few. When one enumerates interiors so unequally lighted by day that it is impossible to get an even exposure, mines or caves to which the sun never penetrates, and theatrical scenes (of which more presently), I think the list is pretty well complete.

To the professional portraitist, no doubt, the case presents itself in a different aspect. To him, in such a climate as ours, where for several months in the year daylight is an unknown quantity, it is worth while, at almost any cost, to be independent of it; and here, I think, is the chief value of gaslight work, for, to my mind, there is no question that, given a sufficient quantity of it, gas will produce a much softer and more pleasing result than all the magnesium in the world. It is, moreover, always ready; no preparation is required, and there is an absence of the scared and stony expression that one usually sees in a portrait taken by the latter method. The exposure also, though somewhat longer than one is accustomed to with the modern rapid plates, is no more than was of everyday occurrence in the days of collodion. I propose presently to make an exposure or two, when I shall give twenty to thirty seconds, and have every hope that a fairly well exposed negative will result. The lens I have here is a half-plate portrait kindly lent me by Mr. Lyonel Clark, and the light I shall use is the Welsbach, which is a bright, steady light, rich in actinic rays. I hope some

\* Read before the Camera Club.



other member will afterwards make use of the magnesium flash, so that a comparison may be made. Before doing this, however, I will say a few words on theatrical work; and I think I cannot do better than preface what I have to say by adopting Mr. Punch's well-known advice and saying to those who feel inclined to tackle this branch of work—"Don't." The difficulties connected with it are many; and, although in the particular case of which I speak I met with the greatest courtesy and attention from everyone concerned, and received *carte blanche* in the matter of light, &c., as well as most hospitable entertainment, still I think there are so many obstacles to success that I am afraid theatrical photography will never become a matter of general practice.

You must first find a manager who is willing, and, still more important, whose company is willing, to offer themselves a sacrifice in the cause of science. Then you must make up your mind, if you want to get anything like enough exposures to illustrate a play at all completely, or, indeed, anything more than perhaps a single shot at its final scene, frequently by no means its best, to make a night of it, and here you are met with your first difficulty, for this involves so many other people making a night of it also, that, except in the case of the company being a small one, and the manager (or yourself) being willing to incur some considerable expense, you are about floored at the outset.

"Mr. Roberts, my last 'bus goes at 11.30. I hope you won't keep us here long." "Mr. Roberts, I don't see the good of this; it has been tried before, and has always been a failure." "Beg pardon, sir; hope you won't forget the scene-shifters," was the sort of greeting I had as soon as the audience had dispersed and the curtain was raised. This from a company not numbering a dozen all told. Then the larking stage set in, and, of course, when everyone is on the giggle, it is impossible for them to stand steadily for any length of time. What it would be with a large company—a pantomime, a "Faust," or a burlesque—I leave you to imagine, though I think Mr. Clark can tell you something on this point. I have heard rumours as to certain "beautiful white legs," as Mr. Haggard would probably describe them, which I will leave him to speak of. Presently, however, certain tables began to make their appearance, accompanied by plates and dishes, champagne bottles, &c., and I was conscious that a more contented air began to pervade the house; all felt more resigned to their detention, and we began to settle down to our work.

Here the technical difficulties commence. Of course, in all theatres, in consequence of the slope of the stage, the scenery—certainly of buildings, or interiors (though possibly it would not be the case with an open or forest scene)—only appears upright, and square when viewed from one point of the house, viz., the stalls; but you can't put your camera there, because you would find, in most theatres, that the dress circle above would cut off half your picture, so that you are practically compelled to work from the dress circle, and here you probably find, even when your swing-back is tilted to its utmost, that your up-rights are not upright, and everything is more or less out of the square. Then, if you go to the front of the circle, you are most likely too near the stage, as you must, in order to get the necessary speed, use a narrow-angled lens, which will work at F. 4, and if you go to the back of it you have to reckon with the pillars which you will probably find obstructing your view. Practically, you have no choice as to position, and must make the best compromise you can. The same remark applies to focussing; your portrait lens having little depth of focus, the only thing to be done is to arrange the characters in as nearly as possible the same plane and focus to the most important. Now, in such a case as this everything had to give way to speed. My object was to get a properly exposed negative within such a space of time as my subject could be trusted to keep still for, not a mere silhouette. I got the latter at five or ten seconds, working at F. 8; but previous experiment had shown me that to get the former, at least fifteen seconds at F. 4 would be necessary. I tried first a lens of, I think, 13-inch focus, by Ross, and subsequently a Voigtländer's Portrait Euryscope of, I believe, 12 inch focus, and think there is very little to choose between them. Both were good, and of the two, perhaps I incline to the Voigtländer as being slightly—very slightly—the more rapid. I believe he claims that his lens gives much greater depth of focus than the older form of portrait combination, but I cannot say I found this.

Now a word as to plates. I made many exposures with plates of various makes—Thomas, Fry, Edwards, and Cadett—and with various colouring matters, before determining that which was

most suitable for the work in hand, and think that without doubt erythrosin gives the best results by yellow light, when used in conjunction with a plate containing a large amount of iodide, such as Cadett's. I first tried Edwards's plates prepared by Dixon, but did not find them so fast as Dixon claimed for them. I then got Dixon to treat for me some of Cadett's, and found them not only faster, but cleaner and better altogether. Still, I did not feel satisfied, and resolved to experiment for myself. At this juncture, Mr. Hyslop gave me a formula, compounded of erythrosin and ammonia, for treating the plates; and I am glad to have this opportunity of expressing my indebtedness to him. I tried this, and though the resulting plates were better in every way than the Edwards's, they were perceptibly slower than Cadett's, which Dixon had treated. As regards cleanness of working, &c., they left nothing to be desired. Indeed, except in the one point of speed, they were most excellent, but I was seeking speed above all things.

I then prepared another lot of the solution using partially the same materials as his had been made from, but with an alteration in the method, and the addition of another constituent which suggested itself to me. With this I tried again, and found I had distinctly better results. I was, however, not quite satisfied, and made a further modification, which I found to be a further improvement, and this I finally used. Most of the formulae that I have seen are far too strong in colouring matter—bear in mind that I am still alluding to the question of speed as distinct from the correct translation of colours. A member showed me here one day a plate which he had prepared, and which was about the colour of the bloom on a hothouse grape. He was apparently surprised that he could not get on with it—well, I wasn't. I think a sixth to a fourth of a grain to the ounce of water amply sufficient, and have found better results when the plates have been soaked for a minute to a minute and a quarter at most, than when treated for two minutes, as commonly recommended. I have brought with me to-night a few bottles of solution ready for use, in case any member would like to experiment; and if great speed be sought, I think the plan recommended by, I believe it is, Mr. Wellington, of giving the plates a final bath of silver nitrate—one-twentieth per cent. solution for three minutes—will be advantageous. This will be best given after the plates have been dried of the staining solution, and not while wet. The plates, however, do not keep so well after this, and there is a tendency to fog. Now a word as to development. Let this be, in all cases, very slow, and use plenty of bromide. Further, if the final silver bath be adopted, a prolonged soaking in a strong bromide solution before development will be found to obviate the fogging tendency of the silver.

#### HOW TO MAKE A HOME-MADE FUMING BOX.

BY A. P. SMITH.

BE my albumen paper good, bad, or indifferent, in my own practice I always fume it all before printing, and having discarded long ago the use of cuss words, tins, &c., to hang my paper in an old soap-box, I now use a contrivance which I propose to describe, claiming for it nothing but that it is a necessary evil. The box is the first requisition, and I must take it for granted that every one possesses the time-honoured soap box; but if there should be any one who does not possess such a



Fig. 1.

useful article, a dry-goods box will do, or better still, a box made for the purpose, with a cover fastened by hinges. Then through the two sides and close to the top should be bored holes



about four inches apart. Passing through these holes, cords may be drawn, and tied at the ends. Over these cords the albumen paper may be hanged for fuming, as seen in Fig. 1.

Fig. 2 is a sectional view showing the box filled with paper. A B is a fine wire screen used to equalize the fumes coming from the saucer of ammonia.

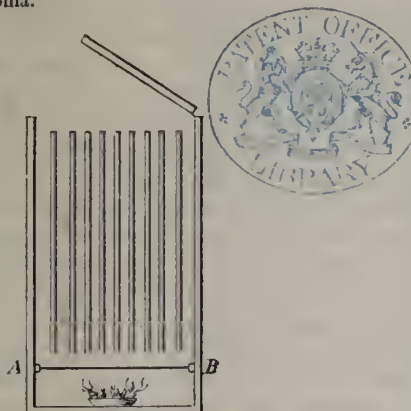


Fig. 2.

Attached to the front of your box should be a door with hinges about level with the wire screen. This door is to give access to the lower edges of the silvered paper hanging over the cords.

From some old mounts cut a number of oblong pieces shaped as in Fig. 3. In these pieces make a slit with a knife about two-



Fig. 3.

thirds of their length. Gently catch the two lower edges of the paper together with these improvised clips to prevent the paper curling while fuming. Then fume in the usual manner.—*Photographic Times*.

## INSTANTANEOUS STUDIES.

### No. 15.—CHARITABLE PHOTOGRAPHY. (Continued.)

(Our Instantaneous Photographer writes:—"Mr. W. Adcock, in your last issue, draws attention to an argument used by Mr. Constantine in favour of charitable photography which is too good to pass over. Mr. Constantine says: 'He (the amateur) possesses the knowledge necessary for taking pictures of his acquaintance, their children, his pets, and . . . could boldly make a charge for his work without any danger of personal or mercenary motive being imputed.'")

*Conscientious Amateur* (entering gaily, armed with apparatus). Here I am. Come to spend a nice long day with you. I want to take your photo, old boy, and yours, Mrs. Jones, and the children's down to the baby's. Your dog must be photo'd, and so must the cat, and the parrot, and the white mice.

*Chorus of Children*. Oh, you kind Mr. Smith.

*Conscientious Amateur*. Ah! I thought it would please you. Come on, Jones, old fellow, hand over the money. This is for the Institution to provide reduced gentlewomen with muffins and crumpets, sweetbreads, and other luxuries which their slender means cannot furnish them. It's purely charity, only I find it best to go on the lines of the professional photographer fellows, and get the money first. See!

*Smith* (doubtfully). Yes, but what does it cost?

*Conscientious Amateur*. Oh, a mere trifle—say five guineas for the whole lot, including the white mice.

*Youngest Hopeful*. And my tricycle horse, Mr. Smith?

*Conscientious Amateur*. Yes, and your horse as well. You see, old fellow, the advantage is, that instead of having a cut-and-dried, artificial, pedantic production such as the professional chaps turn out, you get something natural and free-and-easy. I'm well acquainted with you all, you know, and that's the advantage I have.

*Mr. Jones* (sitting down). Well, go on. Here's the money. You'd better take me first, because I want to be off to the City.

*Conscientious Amateur*. All right. But, my dear fellow, you mustn't sit bolt upright as though you were in an ordinary studio. Look here, I've seen you put your feet on the mantelshef scores of times. That's it. Now put your hands in your pockets. Good.

*Mrs. Jones*. Gracious, George! I hope you won't be taken in that horribly vulgar position.

*Mr. Jones*. My dear, Smith insists upon it. He says I often do it.

*Mrs. Jones*. I know you used to do it. But you broke so many of the ornaments, I broke you of the habit.

*Mr. Jones* (aside to Smith). I say, old boy, I don't think it'll do. My wife doesn't like it.

*Conscientious Amateur*. Oh! we'll try another pose. Let me see. I've seen you sit with your face towards the back of the chair, and your legs across the seat with your feet on the highest rung.

*Mrs. Jones* (catching sight of the position). George, for goodness sake don't. You look for all the world like a monkey in the backwoods of America. Doesn't he, Mr. Smith?

*Conscientious Amateur* (responsible for the pose, is not over pleased, and replies stiffly). I was not aware that monkeys in the backwoods usually sat on chairs. Perhaps you would pose George yourself.

*Mrs. Jones*. I don't understand anything about photography—it's so messy; but I should like a photo of George the same as he had at Bond Street. In this way (*sits George up in the orthodox style, arranges his shirt collar, pulls down his cuffs, and sends for a brush and comb to smooth his hair*).

*Conscientious Amateur* (desperate). Oh, but if you touch his hair you'll spoil it. I've seen it rough and tumbled like that scores of times.

*Mrs. Jones*. So have I. I'm quite tired of telling him of his untidy appearance.

*Conscientious Amateur* (clings to his point, and argues with Mrs. Jones).

*Mr. Jones* (looking at his watch). I'm very sorry, old boy, but I must be off. You must take my portrait another time. Ta, ta.

(*Exit Jones and Mrs. Jones to see him off. In the meantime, Smith seizes upon Ethel, an infant of three years old, and places her at the table with her mamma's workbox before her. He is about to focus when Mrs. Jones enters.*)

*Mrs. Jones* (screaming). Oh, Mr. Smith, how could you! Look at the darling with the scissors in her hand!

*Conscientious Amateur* (putting up his head from beneath the focussing cloth). I didn't see she had got the scissors. Children are very fond of work-boxes, and it seemed to be a very natural pose. Besides, the last time I called here Ethel had got the workbox and—

*Mrs. Jones*. She was punished for it.

(*Exit with Ethel screaming. Smith thinks he will try the dumb animals. Whistles in dog from the garden.*)

*Conscientious Amateur* (to eldest boy). I say, Tom, what's Ponto's favourite position? I used to know Fido's, but I'm not so well acquainted with Ponto.

*Tom*. Oh, Ponto's an awfully lazy beggar. Generally is curled up asleep, and you can't tell which is his head and which is his tail.

*Conscientious Amateur*. That won't do. Must have him doing something.



[ENTER MRS. JONES.]

Mrs. Jones. There's that nasty dog in the drawing-room again. How dare you let him in, Tom?

Tom. Wasn't me, ma; it was Mr. Smith.

[And so it goes on. The result of the day's proceedings is something like this:—10.0 to 10.30, abortive attempt to photo Mr. Jones; 10.30 to 11, ditto, ditto, to photo Ethel; 11.0 to 11.30, ditto, ditto, to photo Ponto; 11.30 to 12.30, the Higginsons call, when photography is suspended; 12.30 to 1, abortive attempt to photo Tom, Mr. Smith insisting upon photographing him in the act of spinning a top, as he is well acquainted with Tom's top spinning powers; 1 to 2, luncheon; 2.30 to 3, abortive attempt to persuade Mrs. Jones to be photographed, she insisting upon waiting until she has a new dress; 3 to 3.30, abortive attempt to photo the parrot. At 3.30 operations are adjourned, and charitable photography secretly voted a nuisance by the whole household.]

### Notes.

The Liverpool Exhibition seems to be a success in the widest sense of the word, and the awards of the judges—all well-known and competent men—have just been announced.

Only two have received the highest award, a circumstance which gives this award some significance; the gold medallists being J. Gale and W. J. Byrne.

As regards the second-class award—a silver medal—we have a longer list; no less than thirty-two. The following is the list in the order as published:—Robinson and Thompson (Liverpool), F. M. Sutcliffe, Green Bros., Jackson Bros., M. Bucquet, W. Parry, A. Vandyke, Debenham and Gould, J. Lafayette, H. S. Mendelssohn, H. H. Williams, G. W. Wilson and Sons, B. G. Wilkinson, E. H. Baldry, T. G. Hibbert, G. Davison, F. P. Cembrano, E. D. Anderson, H. Lupton, T. B. Sutton, Captain L. R. Philips, M. Auty, Robinson and Thompson (2nd), Alan Garnett, Edward Twigge, Dr. E. W. Alabone, R. Crowe, W. P. Riley, E. Penton, J. W. Kenworthy, F. M. Sutcliffe (2nd), and D. Hedges and Sons.

The third-class award list (bronze medal) is as follows, the order being that of the printed list issued by the Society:—H. P. Robinson, J. P. Gibson, F. W. Morgan, E. Rose, C. Cheal, G. West and Sons, H. Symonds, Robinson and Thompson (besides two silver medals), Mrs. Anckorn, J. W. Wade, A. Bradbury, Albert Smith, Rev. H. B. Hare, J. W. Charlesworth, J. Taylor, H. J. Houghton, A. W. Cornish, Chas. W. Huson, H. J. Houghton (2nd), H. R. Ryle, A. W. Cornish, S. G. H. Dearnle, D. Lewis, D. Cunningham, P. Lange.

The *Court Journal* astonished its readers last week by writing of "a photograph which will speak to scientists of the old world in words direct from that great inventor's—Thomas Alva Edison's—own life." It seems almost a pity to explain that for "photograph," we ought to read "phonograph." A speaking photograph that could either coincide with or dissent from the criticisms passed upon it would be a boon indeed.

The *Athenæum*, some time ago, drew attention to the difficulty which visitors to the National Gallery experience in finding any picture which has been recently added, and which they want to see. The idea of an *Athenæum* correspondent was, that a list of the acquisitions of each year should be hung up in the hall of the Gallery, together with a plan of each wall, indicating exactly where each new picture can be found, and on this the *Athenæum* itself suggested that the hall should be made to contain plans sufficiently large to show the position of every picture in every room; and it would besides have plans of each room hung at the respective doorways. This is all very well so far as it goes, but to people unaccustomed to mazes, a plan is the most bewildering thing possible. The simplest and most effectual system is to have the walls of the rooms photographed. It may be urged that the pictures are sometimes shifted. But this objection applies equally to the notion of a plan. If the photographing of a wall would prevent the tendency to re-arrange the pictures which some directors of galleries are prone to, the expense would not be thrown away, as the convenience of the public would be immensely assisted.

A curious example of the way in which art may assist science is furnished by the late Frank Miles. He had a great fancy for Japanese art, and used to attend the sale rooms in Mincing Lane, and, whenever a small lot of fans attracted him as presenting something unusual, he bought it. It is well-known that the Japanese artist is almost photographic in his fidelity to nature, and it is certain that whatever is drawn has its exact prototype somewhere. Whenever Miles found a new colour or form among the flowers represented, he would find out from what district the fan came, and send it back again to the care of the English missionary or Government official, who would make enquiries, and then, if possible, forward a bulb of the variety drawn on the fan. In this way, Miles was the means of introducing more new varieties of lilies to the authorities at Kew than any of the regular collectors.

If new flowers can be introduced into England by such means, it is very clear that travellers who are also amateur photographers, and do not happen to be botanists, can be of great service in this direction. Most men who come from some far-away quarter of the world laden with photographs of their own production, will be found to have laboured hard to get views of mountains, rivers, and towns, to the total neglect of individual curiosities, whether of the animal or vegetable kingdom. Miles has shown how valuable the picture of a single object may be, and what is true of a lily would be equally true of other things. So far as flowers are concerned, it is well known that the great florists have their agents constantly travelling about the tropics and the antipodes in search of novelties which in Europe have a high commercial value. If, when a traveller makes an excursion into a tropical forest, he photographed by itself any flower which struck him, he might find he had got a picture for which a florist would give a high price.



An amateur the other day made a cruel use of his detective camera. Outside a notable refreshment house in the Farringdon Road hang a couple of mirrors by way of advertisement. One is curved longitudinally, and below is the legend "Before dining at Pearce's," the elongated reflection of the face furnishing the application. The other is curved laterally, and the expanded visage is a sufficient explanation of the announcement, "After dining at Pearce's." This malicious amateur got his friend to stare at the two mirrors, and while he was gazing in that state of horrible fascination which the distortion of one's own face induces, secured a photograph of the reflection. To use a slang expression of the day, these photographs are "too funny for anything."

We alluded some short time since to the rumour that the Treasury, for the purposes of identification, intended to insist on the photographing of the lucky individuals who receive pensions from the Government. Now, whatever be the truth as to this rumour, some cases have lately arisen in which the aid of the camera should certainly be invoked in order to clear up what is, as it stands, an inexplicable mystery. Mr. Hanbury, M.P., has, it seems, been diligently studying the contents of last year's "Finance Accounts," and in it he found particulars of certain allowances which are still being paid to certain persons who, it is expressly stated, were first pensioned in the reign of George III. So down went Mr. Hanbury to the House full of his strange discovery; and, as a result, the Secretary to the Treasury had to stand fire in the shape of quite a volley of questions as to the ages and whereabouts of the individuals who had been pensioned when "George III. was King." A regular ransacking of the Treasury archives followed, and in due course a series of replies prepared by the Paymaster-General's officials were read out in the House; the gist of which was, that proof of the pensioner's life was always demanded prior to making a payment, and so on. But even then Mr. Bradlaugh was not happy, for up he jumped and asked the Secretary to the Treasury whether he was aware that it was calculated that one of the pensioners mentioned must have been a hundred and thirty-seven years old on his last birthday. And then it was that an anonymous Member, below the gangway, made the suggestion we have referred to. "Why don't you bring us the pensioner's photograph?" he exclaimed, without rising; and though Mr. Jackson, M.P., did not make any reply to the suggestion, yet we nevertheless venture to repeat the hon. member's enquiry, and seriously ask the Treasury why, in such doubtful cases as Mr. Hanbury pointed out, the House of Commons is not afforded a chance of seeing for itself what those phenomenally long-lived pensioners are like whose continued existence should be enough to make Sir George Cornwall Lewis turn in his grave.

There is Mr. Bradlaugh's prize pensioner, for example, who was 137 last birthday. Surely, the British taxpayer—or, at all events, the British taxpayer's representative—has a right to see him, if not in the flesh, at any rate in the photo. There is so much natural scepticism,

too, about the country as to the nationality of the "Distressed Spaniards," and the "Polish Refugees," and the "Toulonese Emigrants," and the "St. Domingo Sufferers," who are being paid year after year the sums voted for their maintenance by our philanthropic House of Commons, that an application to the Government to lay their cartes-de-visite on the table of the House could not be fairly refused. Why, in this year of Grace, 1888, when "Distressed Englishmen," and "Crofter Refugees," and "Irish Emigrants," and "Welsh Sufferers," are so numerous, the assorted collection of indigent aliens named above should be pensioned at all by our Government we fail to comprehend. But seeing that they undoubtedly do receive annuities out of John Bull's pocket, why the least that the Treasury can do is to afford the country an opportunity of seeing what this polyglot band of claimants is like. It would be interesting, for example, to compare a "Distressed Spaniard" who receives a pension from our Government, with a starving Lewis crofter who does not. As to the "American Loyalist" who received an allowance up to last year, it is too late to ask for his photograph, we fear. The report about this pensioner is that Barnum, having got scent of his existence, has secured him for his Mammoth Museum as the "Champion Pension Drawer of the World."

Awards at the Crystal Palace, in addition to those announced last week, have been made to the following:—Landscape lenses—medal, J. H. Dallmeyer; certificate, W. Wray. Portrait lenses—medal, Voigtlander, per Marion & Co.; certificate, Swift and Son.

The organ of the undertaking trade, known by the elongated title of *The Undertakers' and Funeral Directors' Journal and Monumental Masons' Review*, is by no means a dull or solemn publication, as one might be disposed to think. Last week it told a story about the managing man of a large firm of undertakers. This gentleman went to a photographer's to have his carte done. He had his usual morose look on, relates our contemporary, so the photographer said: "For goodness sake, man, look pleasant. *This room aint a family vault.*" The italics are not ours, but we reproduce them, because there must be a joke somewhere. Possibly, when the sitter heard this allusion to his trade, he smiled. The popular belief is that undertakers off duty are extremely jolly. By the way, we learn from the same journal that a patent has been taken out for a frame to hold photographs on tombstones in such a way that the pictures will be fully protected from injury by the air and rain. Something of this kind is needed, as the photographs occasionally exhibited in this manner are, as a rule, most melancholy objects of decay.

#### SOME PRACTICAL NOTES.

BY COLEMAN SELLERS, M. INST., C.E.

*Printing from a Broken Glass Negative.*—Having had the misfortune to find a crack in one corner of a very good negative—to cut off the crack would have spoiled the picture—I tried to print from the cracked glass, and got one good print; but in attempting to get another print, the crack ran across the plate,



and that print was good for nothing, showing the crack very distinctly. I had a mixture of turpentine and Canada balsam, equal parts of each, used in retouching negatives. I placed the negative in the frame, and then painted the crack on the glass side of the negative with this mixture; saw that it soaked into the crack, filling it; then wiped off the surplus with benzine. The print made after printing was good, and so were all subsequent ones. The crack had not gone through the film, only through the glass. When preparing to print the third picture from the cracked negative, I noticed a row of small beads of the cement exuding from the crack; these I washed off with benzine, and after that I washed or cleaned the cracked part with benzine each time I used the negative.

*Keeping Silvered Paper.*—A noted chemist called to see me a few weeks ago, and having occasion to mention the method of keeping silvered paper as proposed by a film in Massachusetts, I showed him one of the tin boxes containing the preservative compound. He took some of the material with him, and since he has written me as follows: "I found that the material which I took from that tin case at your house consisted simply of lime and charcoal. There was no chloride in it, so it could not be a chloride of any sort. Burned limestone or caustic lime is a good and cheap absorbent of water from the air, and also of carbonic acid and acid vapours, if present. The charcoal is introduced, probably, only as a disguise." These tin boxes, weighing, say, eleven ounces each, box and all, are sold at the rate of two dollars for six boxes. It may be well for those who want to save a little to try lime freshly burned, that is, unslacked; perhaps it will answer the purpose.—*Anthony's Bulletin.*

## THE LITERATURE OF PHOTOGRAPHY.

BY W. JEROME HARRISON, F.G.S.\*

(33) LIVERPOOL (THE) PHOTOGRAPHIC JOURNAL. Conducted by some members of the Liverpool Photographic Society (Messrs. Berry, Forrest, Corey, F. Howard, &c.)

Three vols, large 8vo.; 1854-'56; monthly. (No. 1 published Jan. 14th, 1854), large 8vo. H. Greenwood, 16, Canning Place, Liverpool.

Continued as:—

(33a) LIVERPOOL (THE) AND MANCHESTER PHOTOGRAPHIC JOURNAL. New series; bi-monthly. Two vols. iv, v.; (also called "New Series, vols. 1-2") 1857-'58; large 8vo. Edited by William Crookes from January 1st to May 15th, 1857. By T. A. Malone from June 1st, 1857, to Feb. 15th, 1858. By George Shadbolt, from March 1st, 1858.

Continued as:—

(33b) PHOTOGRAPHIC (THE) JOURNAL. The special organ of the Liverpool and Manchester Photographic Societies, and North London and Chorlton Photographic Associations. Edited by George Shadbolt; assisted by a competent staff. One vol. (vi.); 4to; 1859.

Continued as:—

(33c) BRITISH (THE) JOURNAL OF PHOTOGRAPHY. The special organ of the Liverpool and Manchester Photographic Societies, and North London and Chorlton Photographic Associations; 1860-'88+.

From March 15th, 1850. The special organ of the following photographic societies:—North London, South London, Liverpool, Manchester, Birmingham, Chorlton. Edited by George Shadbolt; assisted by a competent staff.

Edited by J. Traill Taylor, 1865 to 1879; and 1887-'8. By W. B. Bolton (during Mr. Taylor's absence in America) 1880-86. Twenty-eight vols. (vii. to xxxiv.); 4to.; weekly. Price 3d. Published by H. Greenwood & Co., 2, York Street, Covent Garden, London.

"The B. J. P." has always been in the van of photographic progress. Fortunate is the man who possesses a complete set (its value is from £20 to £30). The first ten vols. were published in Liverpool; all subsequent ones in London.

(34) *London, Edinburgh, and Dublin Philosophical*

*Magazine and Journal of Science.* (See *Philosophical Magazine.*)

(35) MAGAZINE OF SCIENCE AND SCHOOL OF ARTS. Intended to illustrate the most useful, novel, and interesting parts of natural history and experimental philosophy, artistical processes, ornamental manufactures, and the arts of life.

(From vol. ii, edited by G. Francis; large 8vo.; 1839-52. Fifteen vols. London.)

(36) MANUAL (THE) OF SCIENCE AND ARTS, AND PHOTOGRAPHIC MISCELLANY. Edited by J. J. and E. Harrison. Five numbers published 1854; 8vo. London.

(37) MICROSCOPICAL (ROYAL) SOCIETY, JOURNAL of the; containing its transactions and proceedings, and a summary of current researches relating to Zoology and Botany, Microscopy, &c. Edited by Frank Crisp, &c., 1878-88.+ Bi-monthly, 8vo. Price 5s. Williams and Norgate, 14, Henrietta Street, Covent Garden, W.C.

At the end of each number there is a valuable (illustrated) description of new pieces of apparatus. To those who practise photo-micrography these volumes will be of great value.

(38) NATURE. A Weekly Illustrated Journal of Science; large 8vo. Thirty-seven vols. 1869-88+. Edited by Norman Lockyer. Price 6d. (The earlier numbers 4d.) Macmillan and Co., 29, Bedford Street, Covent Garden.

Nature is the leading organ of British science, and numbers among its contributors the principal scientists of the age.

(39) NORTHERN (THE) MICROSCOPIST. An illustrated journal of practical microscopy. Edited by George E. Davis. 8vo. 1881-82. Monthly, price 6d. London; D. Bogue, 3, St. Martin's Place, Trafalgar Square.

(40) NOTES AND QUERIES. A medium of intercommunication for Literary Men, Artists, Antiquaries, Genealogists, PHOTOGRAPHERS, &c. First Series, 1849-'55, vols. i. to xii.; small 4to; weekly. Bell and Daldy, London; price 4d. Second Series, 1856-61; Twelve vols. Third Series, 1862-67; Twelve vols. Fourth Series, 1868-73; Twelve vols. Fifth Series, 1874-79; Twelve vols. Sixth Series, 1880-85+.

Successfully edited by W. J. Thoms, H. F. Turle, and J. Knight.

Now published at 22, Took's Court, Cursitor Street, Chancery Lane, E.C. Price 4d., weekly.

During the first series (1849-'55) *Notes and Queries* was quite a photographic organ, the contributors including Scott Archer, Dr. Diamond, and many other photographers. But of late years this element has quite dropped out of this pleasant little periodical, which has become more and more restricted to antiquaries and "curious" studies.

## Reviews.

EVERYBODY'S POCKET CYCLOPEDIA OF THINGS WORTH KNOWING. Demy 16mo., 160 pages; thin paper and limp cloth. Price 6d. (London: Saxon and Co., 23, Bowdler Street, E.C.)

WE have here an effort—and, on the whole, a remarkably successful one—to crowd an enormous amount of useful information into a small space, and it appropriately opens with a map of the world on the system of rectangular projection, and a concise table of historical events, in which, however, the references to photography are scarcely as accurate as one might wish. We also find a mass of information about the present condition of the various countries of the world, scientific notes and tables, notes of popular weather lore, agricultural constants, medical and surgical notes, and a mass of information from which everyone may learn something useful. There is also a tolerably full index.



# THE PROGRESS OF THE PHOTOMECHANICAL PROCESSES IN GERMANY AND AUSTRIA.

BY HERMANN E. GUNTHER.

No. II.

In printing the grained negative on the zinc plate, the asphalt process is employed by some establishments, as for instance by the Autotype Company (Meisenbach), of Munich, especially if the subject has to be greatly reduced, or if it shows very fine details, as it gives excellent results in this case. But, on the other hand, the asphalt process is too little sensitive, the exposure under the negative taking generally one to four hours in diffused light. Therefore, by most establishments, direct printing with bichromated albumen is preferred, which gives almost the same fine results as asphalt, and is much more sensitive. In one of our largest printing houses this process is worked in the following manner. The white of two eggs is beaten up to a froth and allowed to settle; meantime—

Distilled water	...	...	...	60 c.c.
Bichromated ammonia	...	...	...	3 grammes
Ammonia	...	...	...	6 c.c.
Spirit	...	...	...	9 c.c.

are mixed, and 25 c.c. of this mixture added to 30 c.c. of the albumen solution; this is filtered through canvas or blotting-paper. With this mixture the well-cleaned zinc plate is coated, and placed in the dark to dry. After a period of about two hours the plate will be dry, when it may be placed into the printing frame. The exposure requires one to two minutes in summer, five to ten minutes in diffused light, and in dull winter light fifteen to twenty minutes. For this process it is not necessary to strip the negative film. Development is effected in the following manner. A piece of fine printer's ink is distributed on the inking slab until there is a thin and even coating of ink all over it, then the slab is washed under the tap, and some drops of French turpentine are sprinkled on to the roller, and with the thus diluted ink the slab is once more coated. With this diluted, light greyish ink the zinc plate is now rolled up, until the coating of ink is thin and even. The zinc plate is for five minutes laid in clear cold water, and then with a pad of cotton wool the surface gently rubbed, when the ink covering the albumen protected from light by the black portions of the negative will wash away, leaving on the zinc plate a delicate clear image. This is dusted in the usual manner with asphalt powder, and etched after the resin has been carefully melted out over the flame of a spirit lamp.

There are, however, some other processes employed in this country for the transformation of the grained negative into a printing block, and these are based on the well-known photogenic properties of bichromated gelatine. A film of bichromated gelatine is exposed under a negative or positive, and, by placing it in a water bath, developed to a gelatine relief, which may be used (1) directly as a printing plate in the letter press; (2) an electrotpe cast may be made of it, and used as a raised block; (3) a casting in celluloid caoutchouc, ebonite, &c., may be made directly from the gelatine relief, and this employed directly as a printing block; (4) a casting in plaster of Paris may be taken of the relief, from which a cast in stearine is made, and the latter placed in the electrotyping bath, where an electrotpe casting is obtained of it, which afterwards forms the printing block.

It is obvious, the less transferring or casting operations a method requires, the better will be the results, and the cheaper the process. The first of the above methods being the simplest, must, therefore, be considered as the most practical one. This method is in this country represented by the new invention of Professor Hunsnik, called by him Leintypie, which I have described in the previous volume of the PHOTOGRAPHIC NEWS. Since then, however, this process has been much improved by the inventor. As will be remembered, the developed and

hardened gelatine reliefs, according to the old method, were fastened on zinc plates, and these nailed on wood blocks. This method, however, proved to be unsatisfactory, inasmuch as the reliefs, after having been used for some time, became cracked, crumbled off, and by influence of moisture came off the metal plate. These inconveniences are now entirely avoided by the use of gutta-percha films, which are placed between the gelatine film and the zinc plate. This is effected as follows. The zinc plate, after having been well cleaned and rubbed over with emery paper, is coated with a gutta-percha solution, and dried. It is then heated to about 212°, and allowed to cool. During this cooling process the bichromated gelatine film, before being developed, is laid on at a temperature of between 111° and 77°, whereby the hardening gutta-percha film secures a perfect combination with the zinc plate. When this has been done, the gelatine film is developed in the previously described manner to a relief. By this improvement the gelatine blocks become so solid that they will yield more than 100,000 prints without being injured.

The second class, according to which an electrotpe cast is made of the gelatine relief, and the casting afterwards used as a printing block, is represented in Germany by the photogalvanographic process employed by Dr. Sturenburg, of Munich, which I have described and illustrated in my previous article. This process is by no means a new one—Paul Pretsch worked it as early as 1854—but it has never before been worked on a commercial scale. The difficulty was in the way of getting perfect electrotypes directly from the gelatine reliefs on account of their swelling if placed in the electrotyping bath. This difficulty, however, seems to be got over by Dr. Sturenburg, who has already prepared hundreds of typographic blocks by his process.

An invention of the kind of the third class has recently been patented by Mrs. J. Brunner and Ch. Klary. In this process, celluloid, xylonide, or vulcanised caoutchouc, is used as a material for the production of the printing plates, being heated to such a degree that it still allows the plasticity required. The hardened gelatine relief is brought into contact with this material, and the whole is, in hydraulic or other press, subjected to pressure. After cooling, the celluloid film is separated from the gelatine relief, and may then be used as a printing block.

The fourth class, the most complicated one, is represented by the well-known "Photo engraving Process," as it is widely used in America by the Photo-engraving Company of Crossoupe and West, and other houses. It has, however, never been employed in this country.

*Collo type Printing.*—Germany is the home of colotype printing, and there is no other country in which this printing process has been carried out to such a practical importance and technical perfection as in Germany. There are at least a hundred establishments in which colotype is practised, and in some of them about fifteen machines are in permanent action. As it will be known, colotype, or "Lichtdruck," may be done either by the hand process, or by the machine. Whilst by the latter 700 printed sheets may be obtained within an hour, the hand proof gives only 200 to 250 good prints within a day. Nevertheless there are a few establishments—the renowned house of J. B. Obernetter, for instance—by which hand presses are exclusively employed, because it is said that printing may be done more carefully and more accurately by them than by the machine.

In this country the colotype printing establishments are occupied with illustrations for artistic and scientific works, as well as with reproductions of old engravings or paintings, and with taking pictures of specimens of all classes of art and industry, of landscapes, machinery, and of architectural views. Until recently, colotype was also widely used by manufacturers, engineers, &c., in illustrating their catalogues; but now, as photo-engraving or phototypography has been carried out to such a perfection, the latter is generally preferred for this purpose, so much the more, as



in the case of larger editions phototypography is much cheaper than collotype. A photograph in cabinet size, for instance, reproduced by the photo engraving process in half-tint and printed in 1,000 copies, would cost in all about 50 shillings, whilst the same picture reproduced in collotype would at least cost 90 shillings. The production of the collotype plates is comparatively cheap, but the printing makes the process expensive. Another disadvantage is that the film lasts only for a short time, and cannot therefore be preserved to further editions. Of course, instead of the plates, the negatives are preserved.

As to the process itself, it will be known that the first attempts in it were made on metal plates; the adhesion of the film was generally effected by the oxidation of the metallic surface. It was, however, very difficult to obtain an even and firm film on metal plates, therefore the use of plate glass, which was introduced by Josef Albert, was soon preferred. Instead of stout metal plates, Obernetter introduced as supports zinc plates as thin as paper, and this method is now found to be of great efficiency. It is employed with advantage by the printing establishment of Josef Albert, specially for large size pictures, and by some other houses in this country. Such thin zinc plates are specially used for glazing printing paper, and can be bought with a perfectly even and almost perfectly polished surface. It is only necessary to clear off with emery powder any grease that may happen to be on the plate, when the preparation may at once be proceeded with. The use of these zinc plates, which are also highly recommended by Professor Husnik in his excellent treatise on collotype, affords the means of working with a quick press and endless paper, for the printing plate can be bent round and fastened to the cylinder of the press. The difficulties which hitherto impeded the practical use of zinc plates as supports are now almost entirely removed. The many small spots of oxide which, by uncleanness of the zinc, generally made their appearance on the moistened plates, spoiling the gelatine films, never occur on clean sheet-zinc, and the latter is at present manufactured by the galvanoplastic process. These purified sheet-zinc plates can be procured from M. B. Poirer, successor to G. Marcellin, Avenue de l'Ecole, Bruxelles.

Of the various chromo-collotype processes, which are already extensively used in this country, especially two have proved to be of real practical value. One of these, the chromo-collotype process of Hoesch, of Munich, has already been described in these pages, but there is another one which deserves full attention, namely that invented and employed by J. Loewy, of Vienna. Loewy produces at first six to eight negatives of the subject to be reproduced, on orthochromatic plates, and by placing suitable coloured screens before the lens. From these negatives, which are stopped out by retouching, leaving open only those parts which are intended to print—yellow, for instance, or blue—collotype plates are taken, and these printed one over the other. Such productions, in which colour after colour is printed from its own special collotype plate, have nothing to do with the chromo-photolithographic prints, which are also produced on a very large scale in this country, but in comparison with which the chromo-collotypes are much more delicate, and finer. The accurate drawing and the rich tones of collotype, which reproduce all shades in combination with colour tones printed over or under, together with the great saving in the cost of preparing the colour plates, make the process very valuable.

(To be continued.)

## Patent Intelligence.

### Applications for Letters Patent.

2,751. MATTHEW HENRY PHINEAS RIAL SANKEY, Bawnmore, Bannister's Park, Southampton, for "An improved method of producing photographic vignettes."—Feb. 24, 1888.

2,793. JAMES MEIN ELLIOT, 96, Buchanan Street, Glasgow, for "Improvements in and connected with diaphragms and shutters for photographic and other lenses or cameras."—Feb. 24, 1888.

2,975. HARRY HEAPE, 6, Lord Street, Liverpool, for "New or improved arrangements or devices, or articles of furniture for exhibiting and holding photographs, cards, pictures, and the like."—Feb. 28, 1888.

3,076. CHARLES HENRY GALE, 33, Scarsdale Villas, Kensington, W., for "An improved camera."—Feb. 29, 1888.

### Specifications Published.

17,693. HERBERT BOWYER BERKELEY, of 29, Southampton Row, in the County of Middlesex, Chemical Manufacturer, for "Improvements relating to means for fixing and clearing photographic pictures or images."—Filed 23rd Dec., 1887.

The Patentee says:—

The object of my invention is the production, in an improved manner, of photographic negatives and positives made through the agency of the haloid salts of silver in or on paper, or on glass, or other surfaces which are formed of or have been prepared with gelatine, albumen, or other suitable substance, and which after exposure to light have been treated with an alkaline developer (such as pyrogallol or hydroquinone, and an alkali solution or salt), and with other organic substances.

The said invention affords the means for obtaining, on such surfaces, photographic negatives and positives which shall be free from the yellow or brown tinge, stain, or discolouration usually pervading the aforesaid gelatine, or other substances after their treatment with the developing solution or developer, and which shall have images generally of a grey or neutral colour heretofore completely obtainable only by treatment of the negative or positive subsequently to development with certain acids, or with alum or other substances, which treatment involves loss of time and other disadvantages.

The claim is as follows:—

The following is an example of the proportions which will serve well: Ten parts by weight of the mixed sulphite and bi-sulphite (about half of which mixture is preferably bi-sulphite) of sodium, or of potassium, or of both of these bases, are added to ninety parts by weight of the thiosulphate of sodium, or of potassium, or of both of these mixed together, and of the mixed salts I generally use about 100 grains dissolved in one fluid ounce of water.

The improved solution, mixture, or composition consisting essentially of a soluble bi-sulphite, or acid-sulphite, or soluble bi-sulphites, or acid-sulphites of the alkalies, or of the alkaline earths, or of magnesium, or of aluminium, and a soluble thiosulphate, or soluble thiosulphates of the alkalies, or of the alkaline earths, or of magnesium, as above set forth.

## Correspondence.

### THE CONFERENCE.

DEAR SIR,—Will you allow me again to draw attention to the Camera Club Conference to be held next week, on Tuesday and Wednesday, 13th and 14th inst., at the Society of Arts, and to state that everyone interested in the subjects under discussion is cordially invited to be present.

Programmes showing the order of events will be forwarded to anyone making application. All the meetings are open to ladies.

J. DAVISON, Hon. Sec.

Camera Club, 21, Bedford Street, March 5th, 1888.

### THE FLASH-LIGHT.

DEAR SIR,—In your report of the last meeting of the Photographic Society of Great Britain, you note the trial of an Argand Flash Lamp, of which you report the members present thought it gave a flash of too long duration to anticipate movement of the sitter, &c.

Will you kindly permit me, as sender of the lamp, to say, through the medium of your paper, that with that same lamp, I, on Friday last at 9:30 p.m., took a photograph of a two-year-old infant! The enclosed is a print



from that negative, which is quite unretouched or doctored in any way; it will, I think, prove the flash to be pretty nearly instantaneous.

The reason of the slow flash and loss of powder when the lamp was on trial at Pall Mall was that the magnesium was not blown sharply and suddenly enough, and that the gas flame was not of sufficient length—i.e., ten inches—before the powder was blown through it.

Thanking you in anticipation for inserting this, I beg to remain, sir, yours obliged,  
A. JAMES.  
1, Buckingham Palace Road, London, S.W., March 5th.

### ORTHOCHROMATIC PHOTOGRAPHY.

DEAR SIR,—We are glad to find that Mr Bothamley, in his letter which appears in your last issue, has at last recognised—although he has not very gracefully acknowledged the fact—that the bath processes involving the use of eosine and ammonia, various formulae for which he had previously given under other names, all are included in the Tailfer and Clayton patent. We will leave your readers to judge for themselves how far his present admission agrees with his former insinuations.

It was an easy matter, after the publication of Tailfer's specification, for any one of the copyists quoted by Mr. Bothamley to write a formula and gain a little cheap notoriety by calling it his own. We have already shown that if the process be carried out as described in the specification, no definite formula is needed. The only possible answer to Mr. Bothamley's unmeaning queries, "How much eosine?" "How much ammonia?" "How much alcohol?" is, quantum suff. The proportions are intentionally and very wisely left to the discretion of the operator, who may fairly be supposed to be possessed of ordinary intelligence and knowledge of his work.—Yours very truly,  
B. J. EDWARDS and Co.

*The Grove, Hackney, Feb. 28th, 1888.*

### TINTED PHOTOGRAPHS.

SIR,—Matt surface silver papers are to the fore. As plain salted takes colour kindly, I doubt not that these supplied commercially will also do so.

Heaps of ladies are said to be available on easy terms as clever colorists. To the profession! How about cleverly, sketchily tinted heads, on a photo base, on these matt surface papers? How about stippled and finished heads, more like the miniatures of old days? Are these producible by you? If so, think you not they would be prized by your customers?

You have my hint. Make use of it if worth anything; if not, cast it aside as worthless. I am a mere amateur and yours, obediently,  
WM. ADCOCK.

## Proceedings of Societies.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

W. T. WILKINSON gave some particulars of his method of preparing bitumen for coating zinc and copper plates for line engraving. Four ounces of bitumen is put into a large bottle with  $\frac{1}{2}$  lb ether, shaken up for two days, allowed to settle, and decanted. Another  $\frac{1}{2}$  lb. of ether is poured into the bottle and again shaken up for two days and decanted. The bitumen is now passed through similar quantities of ether six times successively, and then dried on a sheet of paper. It will be now quite friable. To coat a plate, dissolve 10 grs. in 5 ozs. benzole. A portion is poured on the plate, which is then whirled to get an even film—the thinner the film the better; this plate is now dried, and is read for exposure. With a suitable negative, five minutes in the sun will be sufficient. Common turpentine is used for development. The plate is then washed, and placed in a weak acid bath for the first etch. The suitability of a negative can be best judged by placing it film downwards on a piece of white paper.

L. MEDLAND had practically tried Decouden's photometer, but had not found it altogether easy to work. The photometer was held against the screen of the camera with one hand, while manipulation was effected by the other. It being necessary to view it at about 18 in. distance, the light from under the focussing cloth rendered it very difficult to judge when the instrument was properly adjusted; consequently, at each trial he had made, the exposure as registered by the photometer was considerably at fault.

A. HADDON believed a knowledge of the actinic value of the light would prove a better guide to exposure; for this reason he gave preference to an actinometer.

The CHAIRMAN demonstrated with what simple materials an actinometer could be constructed by cutting a small slit in the centre of one of the sides of the outer case of an empty Tandstickor match-box that lay on the table; one end of a narrow coil of sensitized paper is drawn between the inner and outer box, that portion of the strip exposed a given time through the slit referred to indicating by comparison with tints on the same side of the box the actinic nature of the light; the coil is kept inside the box. A wax vesta box could be used equally as well.

W. H. HARRISON exhibited a circular card divided into sections; the outer sections were coloured blue and yellow, the inner sections being black and white. The card was revolved rapidly on a pin passed through its centre; the colours then changed to two shades of grey. The colouring of the card was the invention of Lord Rayleigh. He (W. H. Harrison) had seen at the Royal Institution the red and green of the spectrum projected on to a screen, and producing, when superimposed, a pure yellow.

J. J. BRIGINSHAW mentioned a phenomenon he had noticed after using one eye for some time in working the microscope: on removing the eye from the instrument, and closing the other, everything appeared of a green colour.

W. H. HARRISON said this admitted of explanation, inasmuch as the yellow illumination allowed the red rays to pass, which on relieving the eye left the impression of the complementary colour green.

Prints from negatives taken with the flash light were handed round by J. Hubert; the compound he had used for the purpose was a mixture of magnesium powder, chlorate of potash, and sulphide of antimony. He was of opinion that better results could be obtained with this mixture than by using magnesium powder and gun-cotton, or magnesium powder alone.

A. HADDON drew attention to the injurious effect that might be incurred from using sulphide of antimony. He remembered on one occasion at a lecture, a compound, in which this formed one of the ingredients, being fired. One of the students subsequently was taken ill, and required medical aid.

An album of instantaneous photographs was exhibited by J. B. B. WELLINGTON.

The HON. SEC. announced that the members had an opportunity of testing the merits of James's Argand Flash Lamps, as one of the lamps had been placed in his hands for demonstration. With this apparatus, the charge of magnesium powder is projected upwards through the centre of the flame of an argand burner. Several charges of 20 grains each were blown through the flame, giving very brilliant flashes.

### EDINBURGH PHOTOGRAPHIC SOCIETY.

THE second popular evening of the session took place on Thursday in Queen Street Hall, which was crowded in every part, about a thousand persons being present. The President, W. FORGAN, in a few remarks, introduced the business of the evening. This being the annual exhibition of members' transparencies, the screen was entirely occupied by their work on this occasion. An unusually large number of slides were sent in for exhibition, and room was found for the passage of about 200 through the lantern. The Secretary, G. G. MITCHELL, indicated the subject of each as it appeared, and mentioned any point of interest in connection.

WM. DOUGALL kindly lent his assistance in the management of the musical part of the programme, while Mrs. Dougall played a selection of Scotch airs on the piano. Miss Musitano, Miss Duncan, Mr. Boyack, and Mr. Brucewitz sang at intervals. J. M. Turnbull manipulated the lantern.

A feature of an unusual kind in the proceedings was the exhibition of several slides of the recent eclipse of the moon, from negatives by Wm. Peck, taken with a 13-inch equatorial



reflector in his observatory at Murryfield. He obtained twelve good negatives of the progress of the eclipse, the atmospheric conditions being excellent. Professor Piazzi Smyth also sent a view of the Peak of Teneriffe, by the Hon. Ralph Abercromby. The slides generally were of good quality, and many of great excellence, reflecting considerable credit upon the members for their efforts to keep ahead of anything previously accomplished.

#### NORTH SURREY PHOTOGRAPHIC SOCIETY.

The usual fortnightly meeting was held at the West Norwood Constitutional Club, on Tuesday evening, Feb. 28th, EUXTON MORRISH in the chair.

Messrs. Norton and Chambers were elected members of the Society.

A demonstration of alpha paper was then given by J. J. ACWORTH, who gave a detailed description of the method of working this paper, and showed a simple arrangement for giving definite gas light exposures. By means of this contrivance, once having fixed upon a normal exposure for a standard negative, the proper exposure for any other negative can be readily determined. By means of this arrangement Mr. Acworth exposed six prints from negatives requiring varying exposures; these were all developed at one time in the same tray, the resulting prints being of very pleasing tone. Mr. Acworth's demonstration was remarkable for the lucid manner in which he explained these minor details, which it is impossible to include in the directions sent out by manufacturers, but the want of which is often the cause of failure in the working of new photographic processes.

The next meeting of the Society will be held on March 13th, when there will be a lantern slide exhibition.

#### NORFOLK AND NORWICH PHOTOGRAPHIC SOCIETY.

*President*—F. W. HARMER, Mayor of Norwich.

The first general meeting of the above was held on Friday, March 2nd, at the Society's Rooms, Cooper's Restaurant, Bank Plain, when B. Bullin read a paper on the "Choice and Use of the Camera," to a goodly number of members and visitors. There was also an exhibition of apparatus and novelties by the members. The above Society is established with a view to helping all those interested in the art science of photography, in the city or country. It is open to amateurs and professionals, ladies and gentlemen, and, according to the attendance, it seems likely to have a very prosperous future. The Committee have pleasure in announcing that a course of lessons for beginners has been arranged, of which the above is the first. The second paper and demonstration will be given by the Hon. Sec., Sparham Camp, on Friday, March 16th, subject, "Exposure and Development." The Society meets at the above rooms on the first and third Friday in each month, from October to May inclusive. Any ladies or gentlemen wishing to join, may have all particulars on application to the Hon. Sec., Sparham Camp, Havelock Road, Norwich.

#### CARDIFF AMATEUR PHOTOGRAPHIC SOCIETY.

The customary fortnightly meeting of the above Society was held at their rooms, Working Street, Cardiff, on Wednesday, the 29th ult., the President, ALEX. KELLAR, in the chair.

After the ordinary business had been transacted, the lecturer for the evening, D. JOSTI, proceeded with his lecture on "Spirit Photographs." He explained the system of producing spirit photographs in vogue in Como, in the days of Daguerreotypes, the method of De la Roquette (of Paris), of J. Beatti (of Bristol), and a method in vogue in Loudon in 1871. This interesting lecture was illustrated by a series of well-executed photographs, prepared expressly by Mr. Josti, clearly showing how the various spiritualistic frauds had been produced.

On the proposition of the President, a cordial vote of thanks was accorded to the lecturer.

The next of the Society's lectures will be one by T. Storrie, on "Microscopic Photography," and will take place at the Museum of the Free Library on March 14th.

#### CAMERA CLUB.

On Thursday, March 1st, the subject was "Printing Papers," the discussion being opened by a communication from H. J. Gifford. Sir GEORGE R. PRESCOT occupied the chair.

Mr. Gifford's paper treated of plain salted papers and methods of sensitizing them.

Previous to the discussion, objects of interest were called for, and a flash lamp by Mr. James was handed round and described, also the new adaptable album by Messrs. Marion. A copy of a very convenient card for entering particulars of exposures, devised by Mr. Gifford, was exhibited and described.

The paper having been read, some observations were made by D. P. RODGERS upon Messrs. Watson's matt surface silver printing papers, examples being shown.

Messrs. MARION also exhibited prints on their new plain salted paper, Rive, and rough Whatman.

LYONEL CLARK followed with an additional paper, and the discussion was continued by Messrs. Bond, Ferrero, and others.

The greater part of the week ending 17th inst. will be devoted to conference matters (see programme). On Thursday evening, 15th, some of the novelties in apparatus will be on exhibition at the Club, and a description given by exhibitors. Meeting at 8 p.m.

#### NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

A MEETING of the above Association was held on the evening of February 15th, at the Lecture Hall of the Literary and Philosophical Society; A. S. STEVENSON, J.P., in the chair.

About 500 persons assembled to witness a lantern demonstration with descriptive lecture by the Rev. T. FREDERICK HARDWICH, Vicar of Shotton. The lantern, burning ethoxo gas, was fed by oxygen from one of Brin's cylinders, and the slides, which were beautifully painted, were lent for the occasion by Sir Thomas S. Bazley, of Hatherop Castle, Fairford, Gloucestershire.

On Monday evening, February 27th, a committee appointed by the Association, consisting of the Rev. T. Frederick Hardwich, P. M. Laws, J. G. Allison, J. B. Payne, Edgar G. Lee, and others assembled at the rooms of P. M. Laws and Son, to make a practical trial of Oakley and Beard's valve for automatically regulating the flow of oxygen from cylinders of compressed gas. The result was satisfactory, the lantern burning for two hours very much as it would have done had bags been used in place of bottles.

A variety of slides by York, Laws, Ridgeway, and Lee were shown on the screen, and those present, including Professors Garnett and Merivale, P. M. Laws, J. B. Payne, H. R. Proctor, H. Ridgeway, T. M. Laws, L. Williamson, A. Reid, and Edgar G. Lee (Hon. Sec.) expressed their approval of the light both as regards brilliancy and steadiness.

The committee are unable, at present, to pronounce any opinions on the soundness of the principle involved in the construction of Beard's Automatic Regulator, since by an oversight it came to them without any detailed description of its interior. The following remarks, however, embody the conclusions they arrived at as regards its practical efficiency, so far as could be ascertained by a single trial:—A Brin's oxygen cylinder, originally containing 12 cubic feet, but from which 3 cubic feet had been removed, showed by the gauge a pressure of 90 atmospheres at starting. On screwing down the regulator and connecting it with a biunial lantern, the pressure in the cylinder had sunk to 60 atmospheres at the expiration of the first hour, and at the end of the second to 27 atmospheres. The consumption of oxygen gas was therefore about 3 cubic feet per hour, or rather over when more slides in proportion were dissolved.

The committee are of opinion that this regulator will need caution in using it with the oxy-ether light, because the pressure on the tank side of the jet taps is very high, amounting to as much as 40 inches of water when the taps are closed, and 16 to 20 inches when they are open. This is a safe pressure when thick and strong india-rubber tubing (say  $\frac{1}{2}$ -inch outside diameter, and  $\frac{1}{4}$ -inch inside) is used, but with weak or brittle tubing, tied on loosely or not at all, something might easily give way, and there would then be a rush of inflammable gas through the tank. The oxygen, in fact, would travel so quickly over the ether that no one could say whether it would pick up enough of it to render it non-explosive, and it would readily catch fire at the lantern without passing through the safety punice chamber at all. The quantity of ether consumed in the experimental trial made by the committee was a little under  $1\frac{1}{2}$  fluid ounce to each cubic foot of oxygen. This is more than usual, but it was found necessary to keep up an excess of ether in the flame, otherwise the high pressure caused the flame to leave the tip of the jet, and burn with a quivering motion, and loud buzzing noise, against the face of the lime.



The use of the regulator also with coal gas in what is termed the oxy-hydrogen or mixed gases process will, in the opinion of the committee, require attention. For, supposing the coal gas to be in a bag weighed to one cwt., and the oxygen in a bottle, the conditions would be the same as with two unequally weighted bags under different boards, and consequently if the oxygen tap of the jet were to be accidentally touched, and turned on full during the lecture, the superior pressure of the oxygen, on leaving the regulator, would force it back the wrong way, through the mixing chamber of the jet into the hydrogen bag on the other side. The same thing, in fact, would happen as when a weight falls off one of the bags, or one of the two pressure boards touches the wall in its descent. The best plan would be to use both gases in the compressed state, with a regulator attached to each cylinder, or to work with a blow-through jet, the coal gas being drawn from the main, in which case the most inexperienced person might use the oxygen cylinders with perfect safety.

At the conclusion of the experiments A. REID connected one of "Steward's" regulators with an oxygen bottle, and showed its mode of working, but the time did not allow of an extended trial. The regulator in question was lent for the occasion by Professor Merivale, who has found it to answer in his own practice with the blow-through lime light.

#### PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

The Association met on Feb. 22nd. After the usual opening proceedings, Messrs. Bellina, Gamble, Macy, Stearn, and Tripp were elected members. An application for assistance was then considered, and a sum necessary for the requirements of the case granted.

The SECRETARY read the following letter from the London Stereoscopic Co.:—"Please find enclosed cheque value £14 12s. 8d., being the amount subscribed by visitors to our Exhibition, &c. Wishing your Society every success.—L. S. and P. Co. Ltd."

Feb. 24th, at Committee, Messrs. Appleton and Lee, and Miss Bradley were elected members.

Feb. 24th, Annual General Meeting, President J. TRAILL TAYLOR in the chair.

The minutes of the previous general meeting having been confirmed,

Mr. HUBERT gave an explanation of his action on that occasion. The SECRETARY then read his report and the balance sheet for 1887 as follows:—

"In submitting this report, I desire to call attention to the substantial improvement made in all respects over the preceding year. The total receipts for 1887 are £126 5s. 6d., against £60 8s. 1d. in 1886, being an increase of £65 17s. 5d. The donations exceed those of last year by £53 8s. 6d., the benefit at the exhibition by £2 14s. 8d., and members' subscriptions by £12 7s. The latter is most noteworthy when taking into consideration the fact that the subscriptions have been reduced from 10s. to 2s. 6d. per annum. The increase in members is 164. The calls upon the funds have been exceptionally heavy, grants to the amount of £39 having been made; whereas, in 1886 it was only found necessary to grant £4. In reference to the item for printing, it should be explained that £8 18s. of this amount was incurred at the latter end of 1886, when the alteration of rules necessitated a new edition being printed; also that it includes the printing expenses for the 1886 exhibition, and Mr. Burton's lecture at South Place in the same year; further, that the Committee, having decided upon a course of action to bring the Association more prominently before the profession, a considerable increase has taken place in the item of postage. I would, however, like to add that the result fully justifies the increased expenditure, inasmuch that after deducting all disbursements in grants and expenses, the fund has been increased from £228 1s. 9d. to £273 6s. 6d.—a net gain of £45 4s. 9d."

The CHAIRMAN remarked on the general satisfactory advance made during the year, especially in the liberal donations. The Stereoscopic Co. and others deserved sincere thanks of the members, and the impromptu collection at the North London dinner testified to the kindly feeling prevailing in the Photographic Society towards the Association. After several members had expressed their opinion, the adoption of the report and balance as read was proposed and carried unanimously.

The meeting then proceeded to the election of officers for the ensuing year, with the following result:—

President—J. Traill Taylor.

Trustees—Capt. W. de W. Abney and W. S. Bird.

Treasurer—John Stuart, 112, New Bond Street, W.

Committee—W. Bedford (Chairman), T. J. Collins (Deputy), H. D. Atkinson, J. J. Briginshaw, J. Ziehnendorf, T. Bolas, E. Clifton, T. E. Freshwater, W. J. B. Humphreys, F. H. Berry, H. M. Hastings, H. G. White.

Auditors—J. S. Rolph and Alexander Mackie.

Central Secretary—H. Harland, 83, Hawksley Road, Stoke Newington, N.

Local Secretaries—Bristol—T. Protheroe, 35 and 36, Wine Street; Edinburgh—H. W. Bibbs, 26, Myrtle Terrace, Stateford Road; Huddersfield—W. M. Ashman, 20, John William Street; Sheffield—T. S. Hicks, 141, Cemetery Road.

A scheme for the establishment of an Orophage was next brought before the notice of the meeting. It was thought that the matter would be better dealt with by the Committee, who promised to formulate an address and issue to the profession at earliest possible date.

The meeting closed with a hearty vote of thanks to the Chairman.

February 27th and March 1st. (Committee) Messrs. G. T. Harris and Miss Borthwick elected members of the Association. The committee were then occupied with an application for assistance, and, after due consideration, made a grant to meet the case.

This Association was established in 1873, having for its object the organisation of the benevolence of photographers, as a class, and thereby to afford temporary or permanent assistance to those members, their widows, and children, being in necessitous circumstances, arising from age, sickness, or misfortune, by granting annual pensions, and by giving immediate pecuniary grants in urgent cases to duly qualified applicants, and to aid the unemployed members in obtaining situations.

#### SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

ON the evening of February 14th, members of the Society were entertained by a demonstration conducted by Thos. H. McCollin, of Philadelphia, showing the effective illuminating power of his blitz-pulver. He claimed the powder gave less smoke than any other, contained no dangerous ingredients, and would not explode by concussion—could only start off under successive hammering. His simple device for setting off the powder attracted considerable attention, and was a neat little affair. It consisted of an upright stand four inches in height, supporting a metal pan about two inches square, on which the powder is spread. Directly behind, and adjoining the pan, was an alcohol lamp, and, bending over into the flame of the lamp, was a blow-pipe tube, similar to a lime-light jet in size, having connected at its back a rubber pipe and pneumatic bulb. When the bulb is compressed, it projects a current of air through the alcohol flame, causing a stream of the latter to play across the level surface of the pan. In doing so it ignites the powder, which flashes off instantaneously. He stated that the preliminaries of lighting a match or taper were thus avoided, and, in consequence, the sitter is not disturbed, but is caught unawares. It is also well to keep the gas lighted, that the eyes may not be dilated. In focussing, he advised holding a candle behind meshes of open white worsted work. These can be plainly seen on the ground glass, and hence it is a very certain way. He exhibited some finely executed specimen photographs made with the light, and closed by showing lantern slides made from some of the negatives. The light was specially useful in photographing paintings, as it produced a slight orthochromatic effect. He passed around to members samples of the powder.

The President then introduced F. C. BEACH, who read a paper on "A New Transparent Film," and, at its close, exhibited specimen negatives neatly mounted on cardboard. On the same board, under each negative, was a silver print; by this arrangement the negative and positive could be seen at a glance. He moistened a film, and explained the rapid method of drying the same, going through the manipulation. He also read a short paper on "Photographing Interiors by the Aid of the Magnesium Flash Light," descriptive mostly of A. S. Murray's plan. By a diagram on the black board the arrangement of apparatus was clearly shown. Mr. Beach next exhibited a package of a dozen 8 by 10 negatives clamped together by four spring brass clamps, one on each of the four edges of the package. The clamps were less than the eighth of an inch thick, 1½ inches long, and extended inward about 3 inches. What led him to get up this



device was complaints that certain plates, which were otherwise good, were fogged by mat markings. His theory was that these might be avoided by packing the plates face to face and clamping them, by sliding over the package a thin steel or brass clamp, which would be sufficiently powerful to prevent lateral motion and scratching. He communicated his idea to Mr Cramer, of St. Louis, who agreed to pack a dozen plates (8 by 10) on the improved plan, put the package in box large enough to permit of a little play, and ship the same by express, the understanding being that Mr. Beach would test the plates and report the result. Along with the package was sent a package of plates having mats between, as in the ordinary way. Specimen negatives were shown, and it was found the plates packed face to face were more perfect than those packed with mats. The latter had a number of dust specks. Mr. Beach remarked that no plate in either package was broken. The clamped package, when opened, appeared to be as perfect as when first put up. When a package is opened the clamps have to be pulled off, then the bunch of plates is put back again in the box.

Following Mr. Beach was a paper read by J. H. STEBBINS, jun., entitled "Hydroxylamine and its Use in Photography as a Developer." After explaining its nature Mr. Stebbins concluded that hydroxylamine had an effect in the developer similar to sulphite of soda. It alone, in connection with caustic soda, would not develop a plate as Dr. Eder had asserted; but when combined with pyro, as recommended by Mr. Cassebaum, of Philadelphia, it had an excellent effect. It kept the solution clear, prevented the negatives from staining, and gave to the plate a steel grey quick printing colour. The shadows always kept very transparent. He recommended the following formula:—

## B. No 1.

Hydroxylamine ...	...	...	...	2 grams
Pyro ...	...	...	...	15 "
Water ...	...	...	...	100 c. c.

## No. 2.

Carbonate of soda (crystals) ...	...	...	24 grams
Sodium sulphite (crystal-) ...	...	...	71 "
Water ...	...	...	1000 c.c.

To develop take 65 c.c. of No. 2, and add thereto from 2 to 4 c.c. of No. 1, according to circumstances and the density required. He had developed 13 negatives in one solution, and exhibited specimen plates which seemed to bear out his experience. Mr. Stebbins exhibited a large transparent collodion film which he thought would answer as a support for a gelatine emulsion.

It being a question what constituted a legal quorum for the transaction of business at regular meetings, under the Piffard constitution, David Williams suggested that the President consult competent legal counsel on the subject, and report at some future time. The meeting approved of the idea, and the President was so instructed. At the suggestion of Dr. Piffard and Mr. Wainwright, the President was further instructed by the meeting to withhold from general publication the business proceedings of the meetings of the Society.

## Talk in the Studio.

**PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.**—The usual ordinary meeting of this Society will be held at the Gallery, 5A, Pall Mall East, on Tuesday next, March 13th, at 8 p.m., when a paper will be read by T. R. Dallmeyer, on "So-called 'Depth of Focus,' and 'Diffusion of Focus.'"

**CRYSTAL PALACE AWARD.**—In the statement that a medal for cameras was awarded to H. Watson and Sons, "H." should have been "W."

**A NEW NOTE ON ALBUMIN.**—The well known chemist, A. Liebermann, tells us that if albumin is extracted a few times with alcohol, and then washed with cold ether, it gives a deep violet colouration if heated with hydrochloric acid. It is necessary in this experiment to use the concentrated hydrochloric acid of 1.196 specific gravity, and quite pure. This peculiar property has recently been applied to pathology by the same author, and with the following curious results:—The effect mentioned above was produced with various pathological products suspected to contain albumin; but experiments with hæmo-

globulin, chondrin, and keratin failed, showing that these are not albuminous substances.—*Burgoyne's Monthly Magazine of Pharmacy.*

**RELATION OF THE WAVE LENGTH OF LIGHT TO ITS INTENSITY.**—Ebert gives the results of study of the question whether the velocity of light depends upon its intensity. He shows that changes in wave length of only  $\frac{1}{200000}$  of their value, or changes in velocity of light amounting to 1.5 kilometers, can be estimated by the employment of interference fringes. Various sources of light were employed. It was found that the wave length and the velocity of light did not change a millionth in value for a variation in intensity from 1 to 250.—*American Journal of Photography.*

**PHOTOGRAPHIC CLUB.**—On March 14th, Mr. Medland will give an account of his tour in Russia, illustrating it with views in the lantern.

## To Correspondents.

**T. SCOTT.**—The condensers ordinarily sold for use with the theatrical lime-light are not sufficiently well-surfaced for use in the optical lanterns.

**J. Y. (Leicester).**—We are inclined to think that it will not, unless some antiseptic is present. Perhaps alcohol will answer better than such antiseptics as phenol or salicylic acid.

**E. J. BLISS.**—We can only conjecture that they arise from splashing with some substance which—like perchloride of iron—will discharge the photographic image.

**JOHN TERRAS.**—It was the Crystal Palace people, in their official slip, who put you down as an amateur, and we reprinted this. We are pleased to make the required correction in stating that you should have been described as a professional.

**INDIGNANT.**—It seems to us very wrong to give such a distinctly political bias to the gatherings of a photographic club, and indeed we have had several complaints as to this matter. If this sort of thing continues, the club is not likely to survive long.

**A LANDSCAPE PHOTOGRAPHER.**—We do not insert anonymous letters. W. Adcock is not ashamed to say what he had to say, over his own name; and why should you object to your name being attached to your answer?

**COLUMBUS.**—1. See Abney's "Instruction," published by Piper and Carter, price 3/6. 2. Old collodion, full exposure, and weak iron developer.

**G. PRIOR.**—The only thing is to set them up and photograph them with the camera. The yellow spots will not come out so light as they appear to the eye.

**OWEN WILLIAMS.**—There is no charge for the opinion we gave you, and there is no occasion for you to send it for our inspection, as we quite know the sort of thing which this maker turned out. The original cost was probably twice or thrice that stated by the vendor, but you have paid far too much, as it is merely an interesting relic, certainly capable of being adapted to present time uses, but not rare enough to realise a scarcity price. We do not think it would be worth your while to advertise it for sale in the PHOTOGRAPHIC NEWS, but you might effect its exchange in the direction you suggest, through the exchange column of the *English Mechanic*.

**J. B. WHITAKER.**—The matter is out of the editorial department, and your letter has been handed over to the publishers.

**H. MASON.**—Try Marion, Soho Square.

**E. J. LOVEJOY.**—The hard gelatine of Simeon.

**G. B. CROSSLEY.**—We believe that the lectures, with additions, will shortly be reprinted by Illiffe and Co. of Coventry.

**J. KENNERELL.**—The patent will doubtless be granted in due course, and your best way will be to write to some London house with a view to its introduction into the market.

**M. S.**—Not unless you authorize us to publish it along with your name.

## The Photographic News.

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### MATT SURFACE SILVER PRINTS.

THE value of matt surface photographs for the purposes of colouring with water colours or finishing in monochrome is uncontested, and the practical suggestion made by W. Adcock in a letter published on page 157 is well worthy of the attentive consideration which that gentleman's writings always deserve.

There is no doubt that at the present time, perhaps more than at any other period since photography became practised as a bread-winning pursuit, there is, and has long been, an abundance of available talent which might be usefully employed in the work of tinting many photographs of suitable subjects; but the difficulty in the way of utilising much of this skilled labour lies in finding a profitable market therefor. There was a period when colouring photographs was an important industry, giving employment to hundreds of persons of both sexes, many of whom adapted themselves to the requirements of the art through having undergone a previous training in the work of colouring art subjects, prints, &c. If extravagant prices were not realised for photographic colouring in those days, the necessities of life were, at all events, provided for. But, unfortunately for the class of colorists referred to, someone in America discovered that the paper collaring machine could be made a handy tool for improving the surfaces of albumen prints, and since then highly-burnished prints have been in demand. If a reaction has really set in, then colouring photographs may again be an important branch of the business. It is not that water colours cannot be successfully laid on burnished or polished surfaces by experienced colourists, or that the results are not pleasing when finished; but it is quite probable that public taste underwent a change, whereby the extreme brilliancy obtained by burnishing displaced, to a great extent, the colourist. It is not necessary to revert to the old salt paper or Talbotype process in order to get the most perfect tooth in a photographic base which any colourist can desire. The carbon, bromide, platinotype, or other development processes are each available, or can without difficulty be made so. If, however, printing out on silver chloride and organic silver salts should be selected as preferable for matt surface prints, then Bermuda arrowroot, Glenfield starch, or colourless gelatine, is the most convenient substances with which to coat the paper. Very good results may also be obtained with an aqueous lac varnish or barium sulphate emulsified in gelatine; but if a tolerably white paper be used, a mixture of the three first-named substances answers well, and when printing takes place the aid rendered by each can be distinguished.

Either substance may be employed separately, but the resulting positive will differ from one in which all are present. Whatever chloride salt be selected—whether barium, ammonium, lithium, or sodium, or a mixture

thereof—the proportion necessary should be intimately mixed with the coating substance before application to the paper; it can, however, be effected afterwards by steeping the coated paper in an aqueous solution of the salt. In either case the coated paper must be dried before the next process, that of rendering it sensitive to light. Floating on silver nitrate solution, to convert the alkaline chloride into silver chloride, follows, after which the paper is again dried and ready for use. Detailed formula for the various methods of preparing printing surfaces of this nature will be found in Vol. XXX. of the PHOTOGRAPHIC NEWS, "Positives in Gelatine Citro-Chloride," Ashman and Offord.

We have before us some matt surface silver prints, produced by the formulæ referred to, which have been subjected to very rough treatment. They are, we find, produced on very common paper, which bears some old letter-press printing upon the reverse side. There is an absence of deterioration, hence there is a reasonable probability that they will be fairly permanent. Other examples, differently prepared at about the same time, and bearing two heavy coatings of a thick gelatine solution for the purpose of insuring a glossy surface and brilliancy, have changed in the lighter parts to the same yellow hue highly glazed prints in albumen very often do in the same period of time. This experience coincides with that of other observers, and is an argument which can be well supported in favour of a return to "matt surface silver prints," wherein each worker could the more easily exercise individual taste in the selection of texture, coarse or fine, as best suited the subject to be printed.

Again, English-made paper has in our hands given results quite as satisfactory as that of foreign manufacture.

Hitherto, when important changes take place in methods of manipulation, or in processes, it has usually been effected gradually. A speedy return to matt-surfaced papers, or even a slight glaze like that obtained by diluted albumen, appears somewhat doubtful, unless a greater claim than suitability of such surfaces for the reception of pigments can be substantiated as evidences of superiority. We believe this can be done, and no one is better able to bring the claims of "matt surface silver prints" under the notice of thoughtful photographers than the author of the letter referred to. Hosts of artists are more or less acquainted with the manipulations of photographic printing processes, and should it transpire that the leading amateurs of this country gave as much attention to matt surface silver printing-out processes as they have done to platinotype and the development of silver bromide paper, professional photographers would very soon re-introduce this class of work, when in all probability a staff of colourists would become a necessity.

It will be within the recollection of many of the readers that some time ago R. Offord and W. M.



Ashman detailed in these columns the plan of using "Autotype single transfer paper" for the purpose the title of this article sets forth. Those who are able to give this method of printing a trial will, we think, be well satisfied with the results obtained. The process is very simple. Single transfer paper is steeped until soft, say, for five minutes in a solution of ammonium chloride and sodium citrate, dried, placed in a damp room until the paper lies flat, after which sensitizing on silver nitrate solution takes place, when the paper is ready for drying, printing, and toning in the ordinary way. A glossy surface can be produced by means of this paper provided the single transfer paper be re-coated with a seven or eight per cent. solution of gelatine containing the requisite quantity of haloid salt to produce a vigorous impression.

There is no difficulty whatever about the manipulation of single transfer paper, and any silver printer who understands sensitizing can work the process. Paper which has not been re-coated as just mentioned yields prints of any desired tone, having a matt surface; cold rolling smooths, but does not glaze. The difficulties attending the use of the burnisher with such prints is likely to militate against its practice, as the failures encountered are numerous enough to induce any but the most persistent to leave that method of finishing alone.

#### MORE LEGISLATION AFFECTING FALSE TRADE REPRESENTATIONS.

It has long been a scandal that commercialists in England should trade upon the reputation of those dead or retired from business, by using their names for trade purposes, and should a Bill now before Parliament become law, it will be as illegal to falsely call yourself by the name of a person whose business you have purchased, as it is now illegal to sell as one's own make an article made abroad.

The Registration of Firms Bill, if it becomes law, will expose many photographic commercialists, who, knowing their own reputation to be such as is not calculated to attract, prefer to sail under false colours. The Bill—backed by Sir Albert Rollit, Sir Bernhard Samuelson, Sir Robert Fowler, Mr. Lockwood, Mr. Woodall, Mr. Maclure, Mr. W. L. Bright, Mr. John Barry, and Mr. Hayne—was on the 10th February, 1888, ordered by the House of Commons to be printed, and can be had for 1½d. from Eyre and Spottiswoode, East Harding Street, Fleet Street, E.C.

The important part of the text of the Bill is as follows:—

From and after the commencement of this Act every firm carrying on business, or having any place of business in the United Kingdom, under a firm-name which does not consist of the full or the usual names of all the partners or all the acting partners without any addition; every person carrying on business, or having any place of business in the United Kingdom, under any firm-name consisting of or containing any name or addition other than the full or the usual name of that person, shall register in the manner directed by this Act the name under which their or his business is or is intended to be carried on.

Registration under this Act shall be effected by sending by post or delivering to the registrar at the register office in that part of the United Kingdom in which the place of business of the firm or person registering is or is intended to be situated, a statement in writing containing the following particulars: The firm-name; the nature of the business; the place or places of the business; the full name, usual residence, and other occupation, if any, of the person or persons carrying on or intending to carry on the business; if the business is commenced or any new place of business is established after the commencement of this Act, the date of the commencement of the business or establishment of the place of business.

The persons carrying on or intending to carry on any business under a firm-name required to be registered as aforesaid, shall write and sign, or shall acknowledge a statement of the particulars required for registration, if in the United Kingdom, in the presence of a justice of the peace, sheriff, solicitor, law agent, or writer to the signet; and if abroad, in the presence of a British consul or notary public, by whom respectively such signatures or acknowledgments shall be attested.

The firms and persons required to be registered as aforesaid shall register before they commence business. Provided that if such firms or persons have carried on business before the commencement of this Act, it shall be sufficient if they register within one month after that date.

The name of any firm or person registered under this Act shall be used in all matters connected with or relating to the business carried on by such firm or person.

Where a change occurs in the constitution of a registered firm, the members of the firm as reconstituted shall, within one month after such change, send by post or deliver to the registrar a statement thereof in the form in the Schedule to this Act annexed (or in any other prescribed form).

A registered firm changing its firm-name shall be registered as if it were a new firm, and the statement sent or delivered to the registrar shall mention the former name of the firm as being abandoned by it, as well as the particulars required for a new registration.

If any person by this Act required to send or deliver any statement shall make default without reasonable excuse in sending or delivering the same in manner and within the time specified by this Act, he shall, for every day during which the default continues, be liable on summary conviction before two justices of the peace to a fine not exceeding one pound.

Where any firm or person by this Act required to send or deliver any statement to the registrar has therein made default, and during the default commences any action in the firm name, or for a cause of action arising out of any dealing by such firm or person in the firm-name, the Court shall order the firm or person in default to send or deliver to the registrar the proper statement, and may stay all proceedings in the action until the order be complied with, or allow proceedings to be continued on an undertaking to comply with the order within a time to be limited by the Court. The power by this section given to the Court may be exercised by a judge at chambers, and by a master or district registrar exercising the authority or jurisdiction of a judge at chambers.

Every one commits a misdemeanour, and shall be liable to imprisonment with hard labour for a term not exceeding two years, who makes, signs, sends, or delivers for the purpose of registration under this Act any false statement purporting to be made under this Act and known by him to be false.

On receiving any statement made in pursuance of this Act the registrar shall cause the same to be filed, and he shall send by post or deliver a certificate of the registration thereof to the firm or person registering.

At each of the register offices hereinafter referred to the registrar shall keep, in proper books to be provided for the purpose, a register and an index of all the firms and persons registered, and of all the statements registered in reference thereto.

The registrar of joint stock companies shall be the registrar of firms for the purposes of this Act, and the several offices for the registration of joint stock companies in London, Edinburgh, and Dublin shall be the offices for the registration of firms carrying on business within those parts of the United Kingdom in which they are respectively situated.

Any person may inspect, make extracts from, or copies of the statements filed by the registrar in the register offices aforesaid, and there shall be paid for such inspection such fees as may be appointed by the Board of Trade, not exceeding one shilling for each inspection; and any person may require a certificate of the registration of any firm or person, or a copy of or extract from any registered statement to be certified by the registrar, and there shall be paid for such certificate of registration, certified copy, or extract such fees as the Board of Trade may appoint, not exceeding two shillings for the certificate of registration, and not exceeding sixpence for each folio of seventy-two words, or in Scotland for each sheet of two hundred words. A certificate of registration, or a copy of or extract from any statement registered under this Act, purporting to be signed and certified by the registrar, shall in all courts and before all arbitrators or other persons be admitted as *prima facie* evidence thereof, and of the fact and date of registration as shown thereon.

#### MAKING THE DIAPHRAGM SLOT LIGHT-TIGHT.

ONE of the minor annoyances incident to the use of the Waterhouse diaphragm is the circumstance that light often enters by the slot, and either weakens the image, or causes



flare, according to circumstances; and the fact that T. S. and W. Taylor, of Slate Street, Leicester, send for review an  $8\frac{1}{2}$  by  $6\frac{1}{2}$  lens tube in which the diaphragm guides are lined with cloth, as a protection against the ingress of light, gives occasion to our remarks.

Messrs. Taylor say: "The stops are lined with cloth, and thus form a perfectly light-tight fitting round the diaphragm, and make it possible, as a further precaution, to have the slot at the bottom instead of at the top when the mount is screwed into the camera. The black of the diaphragm cannot be worn off, and the cloth is fixed in such a way that the insertion of the cloth diaphragm cannot tear the cloth from its seating."

We rather think that Messrs. Taylor considerably underestimate the excellence of fit which is usual in the case of the work of high-class opticians; and, indeed, we never remember having seen a lens of which the slot in the tube was so badly cut, or in which the diaphragm was so ill-fitting in the slot, as in the case of that sent. To illustrate this we may mention that the sheet metal of which the diaphragm is made ranges in thickness from thirty-two to thirty-five thousandths of an inch, while the cut in the tube through which it is to pass varies in width from forty-six thousandths to fifty-two thousandths; indeed, it is the sort of cut which one would expect a blacksmith's apprentice to make if he operated with a wood-worker's saw—that is to say, a saw set so as to cut at the sides. It may be, however, that the slot has been cut badly on purpose, in order to illustrate the value of cloth as a light-tight packing. Inside the lens tube the usual metal perforated discs are found, but so far apart (rather over one-eighth of an inch) that they themselves do not form the guides for the diaphragm, but this function is filled by a pair of cloth washers cemented on the inside faces of the metal discs, and which cloth washers come so close together as almost to exclude the light even when no stop is inserted.

When a soft material is used as a light-excluder in the fittings of a photographic objective, this soft material should always be recessed in grooves in such a way that even when that soft material has perished, the metal parts shall fit and work smoothly. In other words, the soft material should be an addition to good fitting, not a substitute for it. The makers of portrait lenses quite understand the matter, and, in the case of the best work, we generally find strips of velvet set in grooves, in those tubes which work in each other.

We quite agree with Messrs. Taylor that the diaphragm slot should be set downwards, especially for out-door work, and we believe that out-door workers in general use the lens with the slot down; still, we never remember using a lens so ill-fitted that the stops dropped out under these circumstances. Many—perhaps most—out-door workers carry an elastic band for the purpose of excluding the light when no stop is used.

#### CONNECTION BETWEEN THE COLOUR AND CONSTITUTION OF MATTER.

At a recent meeting of the Chemical Society, Dr. H. E. Armstrong read a paper on the above subject, and although the whole question stands just now in a very rudimentary grade of development, there is much reason to hope that the extension of our knowledge regarding the matter will be accompanied by a corresponding light upon the real nature of photographic action.

The following abstract of Armstrong's paper is that published by the Chemical Society as preliminary to the publication of the paper in full. We also append some remarks in discussion.

The majority of compounds, especially those of carbon, are colourless; and in the case of elements whose compounds are invariably coloured, the greatest diversity of colouring is often noticeable among the several compounds of one and the same

element—as in that of chromium or manganese, for example: it is therefore clear that colour is in a high degree conditioned by special forms of intra-molecular structure, and consequently that any attempt to determine the "origin of colour" must be based on a knowledge of the structure of coloured matters. For this reason it has become possible only within recent years to discuss the relation between colour and constitution. The author first gives an account of what has already been done in this direction, and refers to Graebe and Liebermann's paper on "The Connexion between Constitution and Colour in the case of Organic Compounds" (*Ber.*, 1868, 106); and to that of O. N. Witt—"Zur Kenntniss des Baues und der Bildung färbender Kohlenstoffverbindungen" (*ibid.*, 1876, 522). Graebe and Liebermann laid down the rule as of universal application that, excluding coloured metallic salts of colourless organic acids, all coloured organic compounds which have been put to the test are decolourised by reducing agents (quinones, azobenzene, nitro-compounds, &c.); and from this they inferred that colouring matters either contain elements with incompletely saturated affinities, or certain of the atoms are present in more intimate association than their retention in the molecule necessitates. Notwithstanding the change in our views of the constitution of quinone, Graebe and Liebermann's conclusions appear still to be accepted, although if Fittig's contention that the quinones are diketones be correct, their conclusion that the colour of the quinones is conditioned by the intimate union of the oxygen-atoms obviously does not apply. Witt formulated the conclusion that the tinctorial nature of aromatic compounds is the consequence of the presence together of a colour-giving or *chromophoric* group, such as  $\text{NO}_2$ ,  $\text{CO}$ ,  $\text{N:N}$ , and of a salt-forming group—either  $\text{OH}$  or  $\text{NH}_2$ . This chemist directed his attention almost exclusively to the consideration of the nature of compounds possessed of tinctorial properties as distinct from mere coloured substances or pigments. The origin of colour, however, is presumably traceable to similar causes in both classes of compounds, while the property of acting as a dye may conceivably depend on peculiarities which stand in no relation to those which are causative of colour; this is an important question to determine.

The dominant idea on which the argument in the paper is based is illustrated by the author by comparison of the unsaturated hydro-carbon with the paraffins. In the paraffins, which are singularly inert compounds, and all but colourless even in the infra-red and ultra-violet regions of the spectrum, the carbon-atoms are united only by single affinities, and the remaining affinities are engaged by monad atoms; the unsaturated hydrocarbons are not only more reactive than the paraffins, but the beginnings of colour are manifest in them if examination be made in the regions above and below the visible spectrum. The latter are conventionally represented by formulae in which the carbon-atoms appear as united by two or three affinities of each, typified by straight lines or dots; these formulae apparently serve to indicate that the value of a "double bond" is twice, and that of a "treble bond" thrice, that of a "single bond," and there can be little doubt that this has long been tacitly assumed, although such a doctrine may not actually have been taught. But within recent years the idea has found favour that "affinity has direction"; v. Baeyer especially has availed himself of this hypothesis in his discussion of the differences in stability of various types of closed chain hydrocarbon. The author would apply it to polyad-atoms generally; and in formulating compounds in which such atoms are united by more than single affinities, would represent the polyad-atoms as united by curved lines in order to suggest that the affinities are under strain in consequence of their being free to act only in certain directions. In the paper, the author cites a large number of cases among inorganic compounds which he thinks afford evidence that the production of colour is dependent on special modes of atomic arrangement, and particularly on such modes of arrangement as involve the existence of a condition of strain in the resulting system, due probably to peculiarities in the affinity relationships of the constituent elements of the system which prevent complete mutual neutralization of the affinities. The occurrence of colour, therefore, is more frequently than not, concomitant with a high degree of reactivity, the coloured compound being usually one of "high potential" or slight stability.

Among carbon compound there is no instance of a hydro-carbon being coloured, giving the term its conventional meaning; and omitting nitro-compounds, there are very few exceptions to the rule that derivatives of hydrocarbons containing only monad



radicles are colourless; the exceptions, moreover, are of a very noteworthy character, being either central derivatives of anthracene, i. e., compounds formed by displacement of the hydrogen-atoms of the central nucleus of anthracene—which although not coloured is significantly fluorescent; or the monad radicle contains at its origin a radicle such as CO. A number of illustrations are given in illustration of this statement. Attention is then drawn to the quinones and their derivatives, Fittig's ketone formula being throughout adopted for these compounds. The author then discusses the constitution of the better known dye-stuffs, and is thereby led to conclusions which in some cases are different from those hitherto accepted.

*Azo-dyes.*—Liebermann's experiments on benzene-azobetanaphthol are referred to, and also those of Zincke and Bindewald, attention being specially directed to the production by these latter chemists from alphanaphthaquinone and phenylhydrazine of benzene-azo-alphanaphthol identical with that obtained from alphanaphthol and a diazobenzene salt. The author thinks that the general bearing of these results has escaped notice, and proposes to apply them to azo-dyes generally, formulating these as of the following types:—

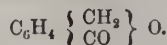


according as they are derived from phenols or amines. The high tinctorial power of the azo-dyes would appear to meet with a more satisfactory explanation on this hypothesis than is afforded by Witt's theory, and it affords a simple explanation of the fact that no acid radicle other than OH, and only ortho- and para-hydroxy or amido-compounds are available for the preparation of azo-dyes. The cases in which this hypothesis will not apply are discussed in the paper.

*Rosaniline and its Congeners.*—Although the formulæ usually assigned to these represent them as compounds of the quinonic type—assuming that in quinone the oxygen atoms, although in paraposition, are united to each other—the idea that they are quinonic compounds, which Graebe, Liebermann, and Caro expressed prior to the publication of E. and O. Fischer's well-known investigation, has apparently now been entirely lost sight of. The author would formulate them in the manner indicated by the following examples:—



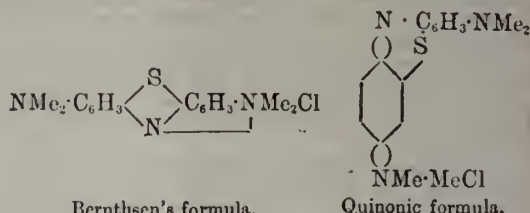
*Phthalicins.*—v. Baeyer's researches are commonly held to prove that these compounds are derivatives of phthalide,



The arguments on which this conclusion is based are discussed in the paper; it is pointed out that the properties of the various compounds classed as phthalicins are so diverse that it is desirable to more fully examine the evidence on which they are grouped together, especially as, apart from the assumption that the phthalicins are phthalide-derivatives, there is little reason to believe that the lactides are chromophoric compounds. v. Baeyer supposes that phenolphthalein is formed from dihydroxytriphenylhydroxymethanecarboxylic acid by separation of the elements of water from the carboxyl and the methane hydroxyl, a lactonic anhydride being thereby produced; but if the hydroxyl of the carboxylic radicle were to separate with a hydrogen-atom of the neighbouring  $\text{C}_6\text{H}_4\text{OH}$ , a derivative of hydroxyphenolanthranol would be obtained. This latter constitution, however, has already been assigned to the phthalidein isomeric with phenolphthalein. The conclusion that interaction does take place in this latter manner in the formation of fluoresceins would serve to explain the fact that orcinol ( $\text{CH}_3 : \text{OH} : \text{OH} = 1 : 3 : 5$ ) does not yield a fluorescein, whereas the isomeric cresorcinol ( $\text{CH}_3 : \text{OH} : \text{OH} = 1 : 2 : 4$ ) does, as an anthracene-derivative could only be formed from an orcinol containing two contiguous undisplaced hydrogen-atoms. It is possible that certain of the phthalicins are derivatives of phenylenediphenyl ketone,  $\text{C}_6\text{H}_4(\text{COC}_6\text{H}_5)_2$ . The formation of triphenylmethane-derivatives from compounds of this type can easily be accounted for, as benzil is converted by alkali into diphenylglycolic acid; and this assumption would serve to explain the formation of additive compounds with acids, such as are obtained from orcinophthalein, for example. It is noteworthy that the dimethanildiphtalein prepared from dimethylaniline is not only itself colourless, but yields colourless salts; this may be a true phthalide-derivative. Also that the diamidodiphenylphthalide which v. Baeyer prepared from diphenylphthalide, and which he converted into phenol-

phthalein, when methylated yields a green compound apparently identical with the "phthalic-green" which O. Fischer prepared from dimethylaniline, and which he represented as an anthracene derivative.

*Methylene-blue.*—It is suggested that this also is a quinonic compound, thus:—



Other dye-stuffs and coloured compounds are considered in the paper.

#### DISCUSSION.

Dr. Debus said that Dr. Armstrong had called attention particularly to the type of coloured substances. Now flowers of sulphur at  $-50^\circ$  are white; larger pieces of sulphur are nearly colourless; but on warming both forms become more and more yellow, and at  $+50^\circ$  are of an intensely yellow colour. Whatever be the type on which sulphur molecules are built up, there is not the slightest evidence that its chemical properties are changed between  $-50^\circ$  and  $+50^\circ$ , or in other words that the structure of its molecules is altered. The colour of sulphur, therefore, is not dependent on its chemical type between  $-50^\circ$  and  $+50^\circ$ , but on its temperature. Many similar examples can be quoted. Thus zinc oxide is white at common, and yellow at higher temperature. The influence of molar arrangement is seen in the following examples: Larger pieces of silver are white, powder of silver is black; pieces of platinum grey, powder of platinum black; a sublimate of mercuric sublimate is dark brown, and powder of the same substance red. In all these cases there is no evidence that the molecular structure of the substances has undergone any change.

Professor Rücker said that if he had understood Professor Armstrong rightly, his hypothesis was not in any way opposed to the idea that the forces between atoms acted in straight lines. If for purposes of illustration they made the crude supposition that a carbon-atom had four poles or centres of force on its surface, it was possible to conceive another atom adhering to one of the poles, or to a point on the surface half way between two of them. The heat of combination, the stability of the compound, and so forth, would depend on the position assumed by the second atom relatively to the poles, but no single pole would have done the maximum amount of work which the attractions it exerted could perform on the atom until the latter finally adhered to it. In other positions there would, therefore, be a certain amount of "residual affinity." A position of more or less stable equilibrium might be found in which an atom combining with others was under the influence of a resultant force which was not equal to the sum of its individual components, and he believed that it was ideas of this kind which Professor Armstrong's notation was intended to convey.

As regards the question whether colour was due to the internal arrangement of the molecule, absorption was ordinarily attributed to vibrations set up among the atoms of which each molecule was composed.

He thought that attempts such as that embodied in the paper to connect the physical properties of substances with the molecular constitutions were necessary before any further attempt was made to frame a mechanical theory by which the connection should be explained.

Professor G. C. Foster referred to Professor Armstrong's remark, near the beginning of his paper, that, in the discussion of the colouration of bodies, their behaviour towards the invisible ultra-red and ultra-violet parts of the spectrum could not be separated from their behaviour towards the visible rays. In his opinion this remark was of fundamental importance. It appeared to him that the real question raised by Dr. Armstrong was whether a definite relation could be traced between chemical composition or chemical structure and the existence and position of absorption-bands in the spectrum of the transmitted radiation. The presence or absence of colouration, as it could be judged of directly by the eye, gave no conclusive answer to this question, for, as Professor Dewar had just reminded them, a substance might be as colourless as water, and still exert strong absorption



the ultra-red, or, as in some of the substances examined photographically by Professor Hartley, it might have strongly marked absorption in the ultra-violet. But, more than this, a body might exert selective absorption within the visible spectrum, but if it happened to absorb two complementary colours it would be judged of by the eye as though it were destitute of selective absorption altogether. The subject, therefore, seemed to him to involve a systematic study of absorption-spectra.

Dr. Morley saw great difficulty in applying to inorganic compounds Dr. Armstrong's hypothesis that the less stable bodies were the more highly coloured, and instanced the yellow and red mercuric iodides, the red iodide being the more stable at ordinary temperatures.

A. G. Green remarked that, as he understood, Dr. Armstrong considered the colour of organic colouring matters to be due to the unsaturated affinities or high potential of the quinone type to which these compounds can all be referred. Now he believed Dr. Armstrong regarded water as both an unsaturated and a coloured body, so, applying the same argument, why should not all aromatic compounds capable of being referred to the water type be coloured, or, at any rate, such as have sufficient molecular weight?

Dr. Armstrong, in reply, referring to Professor Foster's remarks, said that there was great difficulty in discussing colour, owing to the want of any agreement as to a colour scale, which made it impossible to compare effects produced in different regions of the spectrum; it would undoubtedly be necessary ultimately to take into account the absorption effected in the regions beyond the visible; at present, however, there was far too little information at our disposal for this purpose, but he believed that the same principles would apply in the main. In the course of the discussion he had been asked for explanations of matters which he did not pretend to explain; he did not claim that what he had said was particularly novel, but it did appear to him that it was of importance to group together the facts, and the conclusions with regard to the character of coloured compounds in general at which he had arrived appeared to be of significance.

### THE AMERICAN LANTERN SLIDE INTERCHANGE.

THIS interchange, organized in 1885 by George Bullock, of Cincinnati, and F. C. Beach, of New York, has been so successful in its working together with the exchange of foreign slides with the London Camera Club, that a conference was called in Philadelphia, February 20th, 1888, to formulate rules for its future government. Below is the report.

Representative delegates in conference, assembled at the rooms of the Photographic Society of Philadelphia, on Monday, February 20th, 1888, have agreed to form an association of photographic societies for the purpose of making and exchanging lantern slides among its members and foreign photographic societies, and propose for adoption the following regulations.

The name of this association shall be The American Lantern Slide Interchange.

The object of the organization shall be to promote interest in photography through the medium of lantern slides, by arranging for regular interchanges of the work of the different clubs between each other, and exchanges jointly with the clubs of England.

The members of this association shall consist of the following nine photographic associations, to wit: Photographic Society of Philadelphia, Philadelphia Amateur Photographic Club, The Society of Amateur Photographers of New York, The Brooklyn Camera Club, The Boston Camera Club, The Pittsburgh Amateur Photographers' Society, The Cincinnati Camera Club, The St. Louis Association of Amateur Photographers, and The Chicago Lantern Slide Club. The membership may be increased at any time by a vote of the majority of the members of the Board of Directors. Any applicant for membership shall submit with its application a set of not less than fifty slides made by its own members. Any member of

the interchange desiring to withdraw from membership shall notify the manager on or before the 20th of February of each year.

Each constituent society shall, at its first regular meeting in March, 1888, and at its first regular meeting in January of each year thereafter, elect one of its members as a delegate. These delegates, when elected, shall constitute a Board of Directors. On the 1st of April in the year 1888, and on the 1st of March in every year thereafter, the Board of Directors shall organize by electing, either at a meeting called for that purpose or by correspondence, as shall be deemed best, a manager and two assistants, who shall together constitute the Executive Committee of said Board of Directors. The Executive Committee of the Board of Directors shall determine the number of slides to be contributed to the interchange each year; they shall formulate a system of rules governing the progress of the slides accepted for the interchange, and shall decide how the slides to be sent abroad are to be chosen; also how the foreign slides received in exchange shall be divided. The Committee shall issue a call on or before the 20th of May of each year for contributions of slides from each society, which slides must be shipped to the manager on or before the 15th of October following. On or before November 10th of each year the Executive Committee shall start the slides on the circuit. It shall be the duty of the Executive Committee to determine what portion of the slides contributed by each society shall be sent on the circuit. If more than fifty per cent. of those submitted by any one society be thought unworthy of exhibition, the whole number submitted shall be returned to the society sending them. If this occurs upon two successive years the membership of that society shall cease. The Committee may designate some topic or text to be illustrated by the various members of the interchange for that year, and may specify the number of slides, and the amount of text to be furnished for the purposes of such illustration. In case of the clubs being called upon to illustrate some subject connected with descriptive text for reading, not more than seventy-five per cent. of the negative and slide work need necessarily be that of the members of the clubs respectively.

Slides for submission to the interchange shall not vary more than one-sixteenth of an inch from the standard size of three and one-fourth inches in height by four inches in length, the picture being perpendicular to the four-inch side of the plate. The diagonal of the mat opening shall not exceed four and one-eighth inches, and the subject shall be centred on the plate. Slides shall be marked as follows:—The subject-name shall be placed on the right-hand end of the picture as you look at the positive in its proper position, and a thumb label containing the invoice number on the lower left-hand corner of the same.

The negatives from which slides are made must be the work of the member submitting the same, and when the slide is not also the member's work it must be so stated.

Each society shall, on its adoption of these regulations, pay to the manager the sum of ten dollars. Whenever the funds in the hands of the manager shall be reduced to less than twenty-five dollars, each society shall be assessed the sum of ten dollars. Each society shall be reimbursed, from the funds in the hands of the manager, for its expenses incurred in the shipment of slides.

Suggestions for amendments to these regulations shall be made in writing before February 1st of each year and sent to the manager. He shall submit them to the members of the newly-elected Board of Directors for their individual consideration by the 15th of March following, and a vote be taken thereon by correspondence (if no meeting is held). If a majority of the Board of Directors have not voted in favour by the 15th of April following, the amendment shall be declared lost. This constitution shall be considered adopted and in force when it has been ratified by not less than five of the societies herein men-



tioned. Mr. George Bullock, of the Cincinnati Camera Club, is hereby designated to carry out, on behalf of the societies represented, the interchange of slides now in progress, and is also authorized to complete the organization of this interchange.

### A NEW SILVER INTENSIFIER FOR GELATINE PLATES.

BY W. K. BURTON.

I CALL the intensifier that I am about to describe new because it is so, so far as I am aware; but as the principle on which it depends appears self-evident—after it has struck one, at least—it is possible that I am mistaken.

In developing a wet plate, what we do is to apply a developer which has no power to reduce the silver haloid of the film, but which has the power to reduce the free nitrate which is always in contact with the film. The developer is used at such a strength that it is barely capable of reducing the nitrate of silver during the time likely to be occupied by development, but needs some assistance. This assistance is to be found in the power that the latent image has of attracting metallic silver, and, still more, afterwards, in that which the feeble visible image has of attracting more silver, and thereby gaining greater and greater density. The limit of density is only to be found in the exhaustion of the silver nitrate. Then intensification begins; but in this case intensification consists, in reality, of nothing but a continuation of the development process, with more nitrate of silver added. Sometimes we use a slightly different developer, sometimes we postpone the process till after fixing; but in any case the principle is the same: we supply more of the same salt that afforded the silver for the first formation of the visible image, and we apply a reducing agent which will act on this salt, but will have no action on the silver haloid.

Now, in the gelatine process, or in the collodio-bromide process, the action is quite different. We apply from the very beginning a developer of infinitely stronger reducing power than that applicable to a wet plate, and one that acts on the silver haloid directly; there being, in fact, no other silver salt present that it could act on. If now, however, we proceed to intensify with silver, or to attempt to do so—for there are very few of the processes for silver intensification which act with uniform success, at any rate in the hands of all with gelatine plates—we do not, as in the case of the wet plate, simply continue the former process of development: we proceed on totally different lines. We do not attempt to continue the process of development that has shown itself thoroughly suited to the film that we are working, but we revert to the wet plate developer, which may or may not be well suited. In the case of collodio-bromide it naturally is well enough suited; but in that of gelatino-bromide it is not, because there is always great danger of hopelessly staining a gelatine film if nitrate of silver is brought into contact with it. The danger is considerably reduced by having the solution decidedly acid; but it is always there. There is the additional difficulty that the image, in the case of the gelatine film, being in the film in place of on it, the silver forming it is not so free to exercise its "elective affinity" in the case of the gelatine film as in that of the wet plate. This latter applies to the collodio-bromide as well as to the gelatine plate; and the fact that the former is quite intensifiable with silver proves that there is no insurmountable difficulty in intensifying an image that is in the film by the silver method. We must, however, not leave out of consideration the inferior porosity of the gelatine film, and must take it as certain that the intensification of the gelatine film with silver will always be a more difficult problem than that of intensifying the collodion film, whether it be impregnated with the silver haloid by the bath or the emulsion process. It has, however,

long ago been proved to be by no means an impossibility. In fact, in the process now generally recognised to be the parent of all gelatino-bromide processes—namely, that of Dr. Maddox—it was a special feature.

What occurred to me was that there might be no difficulty in intensifying a gelatine negative on the lines of simply continuing the development process, which had proved successful for bringing out the latent image, and that, moreover, there should be nothing in the least difficult in so doing. I cannot say that I have by any means met with such success as to entitle me to lay claim to the discovery of the great desideratum, "the perfect intensifier," yet I have met with such success as to make me believe that my experiments are at least worth publishing, and that perhaps more able experimenters may readily be able to modify my crude process, so that really valuable results may be got.

Bearing in mind a scolding recently administered to the whole photographic brotherhood by my friend H. Gifford, in which he pointed out that, with the exception of Hunt and Herschel, all photographic experimenters had been simple fools in the way in which they had set about their work, and in recording it, I describe precisely the experiments that I have so far made; but, even now, I must confess that the weighing and measuring instruments that I used were merely a druggist's pair of scales and weights and the usual measuring glasses, and that, moreover, I must differ from what I understand to be Mr. Gifford's views in connection with such matters, in holding the opinion that experiments, of the nature to be described, are of just as much or as little value when made with the instruments I have mentioned, as when made with the assistance of a balance that will turn with the 100th part of a milligram, or what not, and that moreover, to use such a balance for such work would be as foolish as to use Whitworth's measuring machine to find out if a rough bolt is a  $\frac{1}{2}$  one or a 1 inch.

I made an emulsion by the following formula:—

A.				
Bromide or ammonium	...	...	...	150 grains
Gelatine	...	...	...	15 grains
Water	...	...	...	12 ounces
B.				
Silver nitrate (dry*)	...	...	...	200 grains

No doubt, to some, the idea of "making an emulsion" will sound very terrible; but when I say that all that is necessary to do is to allow the gelatine—which may be of any kind—to soak in the water of A, to warm this water till the gelatine is well melted, and to pour the dry nitrate into the warm solution, with much stirring, in the dark room, it will be seen that really there is no more trouble involved than in mixing almost any stock solution.

Those who are experienced in gelatino-bromide work will recognise in the above formula one that will give au

\* I wish to say a word about this system of adding the silver nitrate to the bromide solution dry. I mentioned the method some years ago in connection with a method of precipitation of emulsions which I published. At the time I stated that the method was not original, but that I did not know to whom to give the credit of the invention of it. It was pointed out to me then that the first publication was due to Sebastian Davis. In spite of this, the method has often been attributed to me. I may say that I wish that I could claim the credit of having originated it, as the method is really a most valuable one. I have recently come across the original publication of the process by Mr. Davies, and I find that he advised that the nitrate of silver be reduced to powder. This I find is quite unnecessary. Even if exceptionally large crystals of the nitrate be used, the emulsion will be a beautifully fine one. All that is necessary is to thoroughly agitate the bromide and gelatine solution before the silver is added, during the addition, and till the nitrate is all dissolved. It is probably well to add the dry nitrate somewhat slowly, although I have found no coarseness to result, even if it is tumbled in altogether. In fact, the method is one by which it appears to be practically impossible to get other than a very fine emulsion, if the usual precautions as to temperature, &c., be observed. It is also particularly applicable to work on a large scale. I can speak of the success of the process for quantities of emulsion up to such as consume 50 ounces of silver nitrate, and do not see that there need be, in practice, any limit to the size of the batches that might be emulsified in this manner without difficulty.



emulsion in which the silver bromide will be in a very fine state of division, in which there is a considerable excess of soluble bromide, and which will be liquefied at ordinary temperatures. The object in having a considerable excess of soluble bromide is that, with it, there is no need to add further bromide to the developer to be described presently.

Very rapid plates were exposed and were developed, care being taken to stop development whilst the shadows were quite clear and before the density was quite as great as might be considered desirable. The plates were fixed and washed, and were cut in half whilst still wet. To two ounces of water there was added enough of the liquid emulsion to make it distinctly milky. There were then added four grains of pyro and four minims of strong liquor ammonia. Half of one of the plates was taken, and the mixture was kept flowing over it some minutes. Result, at the end of that time, a very slight amount of intensification.

Various quantities of the emulsion were tried, with the result, that as the quantity was increased the intensification was more satisfactory, till, in the end, I used the emulsion undiluted. It was necessary in this case to increase the quantity of ammonia considerably, as the quantity of free bromide of ammonium was, of course, greatly increased. The quantity of ammonia found necessary was about 5 minims to the ounce. Various other experiments were tried, as, for example, soaking a part of a plate in ammonia one part, water three parts, and pouring over this plate water containing some of the emulsion, and two grains of pyro to each ounce, the idea being that the reduction of the silver might be thereby brought about in the film. Result: a barely perceptible intensification of the part that had been treated with ammonia. The attempt was made to intensify plates that had been dried and had laid by for some time. The result was that more difficulty was found in intensifying these than in intensifying negatives that had been newly fixed and washed. Negatives that had been treated with alum were tried, to see if there was any advantage or disadvantage in treatment with this substance in the matter of the intensification. The result was that no difference could be detected between the action of those which had been treated with alum and those which had not. The silver deposited on the film scarcely adhered to it at all whilst it was wet. The finger passed over the film would remove it all. It was therefore found best to wash the negatives very carefully, and only slightly after intensification, and then to let them dry. After they had dried, the silver adhered with great tenacity, and the negatives that could be treated are as roughly as those that had not been intensified at all. In all cases the process was a rather tedious one, several minutes being necessary to produce at all a marked effect.

I tried the effect of using a far smaller quantity of ammonia in the solution than that mentioned, and of assisting the reduction of the silver by occasionally allowing the light from a candle, a few feet distant, to fall on the emulsion mixture; but the results were in no way worthy of remark.

The intensification shows more distinctly in the print from the negative than in the negative itself, there being always a slight change in colour, which is something different, apparently, from a mere pyro stain, as I have found it to withstand the action of acid alum solution. The colour got is not very pretty, but is not really objectionable, as it does not cause very slow printing. There is, of course, no danger of an actual silver stain.

The trouble of mixing the emulsion is, I consider, not a thing of any consideration; but the fact that it will probably not keep for an indefinite time may be. It was shown by H. Y. E. Cotesworth, some years ago, that an emulsion, if it keep liquid, will gain in sensitiveness. This, of course, means that a change sets in which would eventually render the emulsion worthless for the purpose for which I suggest its use. I must, however, say that I

never succeeded myself in getting any rapidity with the process referred to, and that I have kept emulsions at the ordinary temperature, and in a liquid state, for weeks without their losing their colour, red by transmitted light. I purpose, moreover, in my next experiments, to replace one half of the water in the emulsion formula given above with alcohol, an amount that I know the emulsion will stand, and to add some free iodine. I imagine that in this way the ripening of the emulsion will be prevented, and moreover an emulsion practically insensitive to light till the ammonia is added to the mixture described above will result.

I suppose that I may be allowed, in conclusion, to give my own opinion of the intensifier that I have been describing, and to say of what practical use I think it is. Well, I say without hesitation, that unless it can be improved, it is of no practical use except for one particular kind of case. That is the one in which we have a negative that is clear in the shadows, but which is thin—just a little thin. In such a case I would use the intensifier that I have described, even if it cannot be improved, rather than any other that I know of. I am quite confident, however, that it must be possible to improve the intensifier. There are infinite changes that can be rung, both on the emulsion and on the developer, and I trust that some readers may try some of them. The thing seems right in principle.

### Notes.

“Walton's Compleat Angler,” illustrated by photographs on the Lea, by Emerson; and by photographic views on the Rivers Dove, Wye, &c., by George Bankart, said in the prospectus to be “one of the most successful amateur photographers living,” is announced by Sampson, Low, Marston & Co. The price to subscribers is to be £10 10s. for a royal quarto edition limited to 250, and £5 5s. for a demy quarto edition limited to 500 copies.

The gas furnaces of Thomas Fletcher, of Warrington, are so largely used by photographic experimentalists that one may say a few words about his latest invention, a gas blowpipe which will melt through a quarter-inch steel or iron plate in a few seconds, and which would be the very thing for the burglar who operates on safes, were not the blowpipe very noisy in its action.

Mr. Fletcher says he can make the apparatus silent in its action, but he will not do this, lest the burglar should use the arrangement. We, however, very much doubt whether Mr. Fletcher can make such a contrivance—or, indeed, any gas blowpipe—to work silently, and, moreover, Mr. Fletcher must know how thoroughly exploded is the doctrine of suppressing inventions lest evil use be made of them. In addition, he is quite clever enough to see how a safe could be protected even against his blowpipe, a sufficiently thick inside lining of copper in close contact with the iron being all that is required.

The promoters of the Paris Exhibition proceed with regard to photographers on totally different lines from those adopted by the authorities at South Kensington. It will be remembered that the plan of the Council was selling the right to two or three firms; and so rigidly were the rules interpreted, that, as we noted at the time, an artist who



was observed sketching, was "run in" by a police constable, and detained for two hours in the Secretary's room. At the Paris Exhibition no distinction will be made. Any photographer who likes to pay a fee of twenty francs can take his apparatus into the grounds and buildings, and photograph to his heart's content, so long as he keeps to the prescribed period of time, which is four hours, either from 8 a.m. to midday, or from 10 a.m. to 2 p.m. If he cares for it, he can have a season ticket available the whole time the Exhibition remains open, subject, of course, to the above regulations, for 300 francs. By article 8 of the regulations, the photographer is permitted only to take general views of the palace, park, and galleries, on condition that he sends ten copies of each view to the administering authorities. The latter clearly had an eye to the main chance in framing these regulations.

"That is not a bad portrait of So-and-so," said a friend of the original to an artist who had made a drawing for an illustrated class paper, of an individual who had given evidence in a trial in which the readers of the paper in question were interested. "Were you in court at the time?" "No," was the answer. "Then you had a photograph?" "Indeed, I had not." "Then how on earth did you manage to get his likeness?" "I'll tell you. The reporter of the paper who was in the court described him to me, and said he wasn't unlike the Duke of Edinburgh with a dash of Lord Dufferin. I drew three or four sketches of the two heads, altered them slightly according to the directions of the reporter, and that's the result. Excepting in cases of extraordinary ugliness I generally find a man has his parallel somewhere. Look at this drawer. That holds some three or four hundred photos, and I would engage to say that in nine cases out of ten I should be able to find one which would match the required face, always supposing that the observer is accurate in his recollection of the features."

The photographs of Bismarck which are now sold do not, it is said, represent him at all faithfully. His face is pinched, worn, and wrinkled, but his photographs by no means convey this impression, as they usually represent him as a man of Herculean strength of frame, and a fiercely frowning and repulsive face. There are three possible causes for this difference. One is, that the photographs may have been taken some years ago; another, that the negatives may have been worked upon too much; and the third, that the photographs may not be those of Bismarck at all, but of the ingenious gentleman who happened to be like the Prince, and used to sit in an appropriate uniform to unscrupulous photographers until the fraud was discovered some two or three years ago, and the sellers of these spurious portraits heavily fined.

A pamphlet lately published by Captains Mach and Salcher in Vienna, and describing experiments long since recorded and illustrated in the PHOTOGRAPHIC NEWS, has made some sensation outside military circles. It details the experiments on photographing the bullet in its flight, and contains reproductions of the photographs. These

experiments confirm the hypothesis of a body of compressed air in the form of a hyperbole which Professor Mach had previously established theoretically. With a bullet impressed with great speed is manifested the remarkable phenomenon that in the rarefied air which follows the projectile are produced little clouds which form a train behind, and the gyratory movements can be clearly distinguished, the photograph making visible a movement of the air having a resemblance to the movements of the water round a steamer going very swiftly.

A young amateur was very much puzzled the other day. Said he, to a lady: "Have you seen any of the new 'flash' photographs? They're really capital." "Very likely," replied the lady, icily; "I must confess I have never been able to take any interest in a vulgar and brutal amusement." "I-I beg your pardon," said the youth, hesitatingly, "but is it possible you consider photography brutal and vulgar?" "Oh, I am not talking of photography, but of those dreadful 'flash' photographs which you asked me whether I had seen. I can assure you I always walk very quickly past the barrows in the street where such things are exposed for sale."

It is now some two years ago since a correspondent wrote to us and suggested that the Automatic Supply System might be so developed as to enable any one to deposit a shilling in an apparatus placed in a railway station or other public place, to pull a handle and in return be photographed there and then by some automatic and instantaneous process. We need scarcely say that our correspondent was not a practical photographer, and the difficulties inevitably associated with such a plan have not yet been surmounted. Meantime, however, this Automatic Supply System has been very considerably developed, and we notice that the very latest development—newer even than the arrangement by which, for a penny, one can get his or her handkerchief automatically scented with a fashionable perfume—consists in the automatic delivery of a photographic portrait of a well-known actress to any one enterprising enough to first deposit the inevitable penny in the duly authorized manner. Thus, then, it would seem that we are at least a step nearer to the consummation desired by our correspondent, and whose letter, we remember, pointed out that the great objection to photographic portraiture, as at present carried out, was to be found in the fact that being "taken" involved as elaborate and well-nigh as painful a ceremonial as having a tooth out. What the public wants, he asserted, was to be able to be photographed with as little thought of preparation as that with which they buy a box of matches or hail a 'bus.

Now there was, undoubtedly, much truth in this contention, and seeing that the Automatic Photographing Apparatus is not likely to be patented just yet, it has occurred to an enterprising photographer that the next best thing to do is to multiply the facilities for photographic portraiture. "If the mountain won't go to Mahomet, Mahomet must go the mountain;" and if, says he, "the public won't look up the photographer, the photo-



grapher must look up the public. But it may be urged that the photographer already does this on Brighton Beach, Ramsgate Sands, and elsewhere. So far, then, so good; but what is wanted is a photographic revolution in this great metropolis, so that it may be as easy to get one's photograph taken as to take a cab."

To quote all this enterprising photographer has to suggest is impossible, but we may add that, briefly stated, his notion is to scatter photographers and their apparatus so plentifully throughout London, that the public would find themselves constantly exclaiming, "Hullo! here's a camera. Let's get taken!" As we understand his scheme, every waiting-room at the chief terminus would have its photographer lying in wait. Strolling out from his stall during an *entr'acte*, the theatre-goer would find a camera bearing on him as he entered the saloon; whilst by arrangement with the Tram Companies, the place occupied by the lamp at night would by day be filled by especially-adapted photographic apparatus, in charge of a skilled official. Waiting for a train, the public would find the photographic studio side by side with the bookstall; whilst a visit to one's hairdresser would involve the taking of a new carte as surely as the ironing of one's hat. For the special attraction of country cousins, photographic facilities for taking their likenesses with one of "Landseer's Lions," or "Westminster Abbey," or "Cleopatra's Needle," as a background, are recommended. In short, the elaborate scheme is so well thought out that it is a pity the enterprising author did not provide for one probable eventuality. He has arranged for the public to be "taken" here, there, and everywhere, but he has nothing to say about the "taking" of the out-door photographers themselves—by the police!

### THE PHOTOGRAPHIC CONFERENCE.

THIS gathering, consisting of two day sessions in the House of the Society of Arts, and a festive dinner, may be regarded as a success, both technically and socially.

Some of the papers we publish or commence in our present issue, and the remainder will follow in due course.

This successful Conference, and the importance of the papers read, should do much to increase the growing influence of the Camera Club, a Society which seems to become actively useful in proportion as the Photographic Society of Great Britain becomes torpid in its groove.

### SINGLE LENSES CORRECTED FOR ARCHITECTURE.

BY J. TRAILL TAYLOR.\*

As most of you are aware, I discoursed before the Camera Club over a year ago on the subject of "Distortion, mainly by Lenses." My remarks at present will partake of a character largely supplementary to what was then said concerning single landscape objectives, and a method, then only hinted, by which their one fault might be cured—the fault referred to being the distortion they produced, and which rendered them inapplicable for the production of architecture, or for copying maps or plans. I say the direct production, for no matter how distorted the original negative may be, it is easy to reproduce it under contrary circumstances of distortion so as to give a result that is orthographic.

By a single landscape lens I must be held as meaning one in

which there are only two reflecting surfaces, these being the exteriors. About the image formed by a lens of this nature there is a high degree of pluck and vigour, arising from there being no air spaces in its interior, and therefore fewer of those reflections which are a concomitant of every lens, but are greatly intensified when there are reflecting surfaces.

The distortion to which I am to refer in what is here to be said is that of curvature of the margins, and is caused by the oblique rays not passing straight on to the focus, as do in a sense the central ones, but becoming deflected in an increasing ratio as they are transmitted near the margin. With landscape lenses the margin of the picture is formed by the margin of the lens; hence the smaller the diameter of the lens, the less will be the distortion, as there will be less compression of the marginal objects. This compression is of minor consequence in a landscape, but in an architectural subject covering the full size of the plate it has the effect of causing straight lines to be curved; therefore, for copying a map or plan, the lens is unsuitable. Hence, compound combinations in which the defects of one lens are balanced by contrary defects in the other, the results being rectilinearity.

Over thirty years ago the attention of opticians, both amateur and professional, was given to the best means for effecting a cure of distortion; but of all those no one, so far as I am aware, wrought so assiduously in this direction as James T. Goddard. A professional optician, he was also a devoted experimentalist, and introduced many different forms of lenses, which, owing to his commercial resources being terribly limited, caused by his deficiency in commercial tact, were not extensively manufactured or widely known, the more especially as in those days manufacturing opticians appeared to tacitly recognise a species of proprietary interest or copyright in the productions of contemporary producers.

I now introduce a paragraph from my previous discourse to this Club, and I do so as the text for the remaining part of what I have to say. "With a single or distorting lens it is not only possible, but easy, to obtain rectilinear or orthographic photographs. Select two simple lenses, such as strong spectacle glasses, of a miniscus or periscopic form, one being a positive and the other a negative or concave, selected of such strength that one neutralises the other, thus forming a combination nearly equal to a piece of plain glass, and place them just in front of the diaphragm. The lens thus becomes rectilinear. Those of you who prefer the single landscape lens, and may at some time other be confronted with an architectural subject which fills the plate, and is thus projected under distorting conditions, may become quite independent of adverse fate by invoking the aid of this corrector, which may be carried in the pocket ready for use when required."

Let us now hark back a little, before I elucidate what is only faintly hinted at in this passage. And, first, let me say that the condition under which rectilinearity is obtained is this—that every ray which enters a lens shall emerge from it in a direction parallel to that of its entry. Goddard, in his compound landscape lens, shows that he had discovered that by associating with the principal achromatic lens a convex and a concave of such relative power as to neutralise each other, while the focus was not altered, yet was a cure of distortion effected. This discovery, and that of his double periscopic landscape lens, dates from January, 1859. This latter lens, the double periscopic, although only a few were sold and now almost forgotten, has in it the element of goodness; a fact evinced from the circumstance that an eminent optician to whom its existence was evidently unknown has, within the past few weeks, introduced and obtained protection for one similar.

I here submit two untrimmed large round periscopic spectacle glasses, one being a positive of eight inches focus, the focus of the other being similar, so that when placed together their power is nil, or practically so. By separating them to the extent of half an-inch, or an inch, with the convex side of the diminishing lens next to the concave side of the positive or magnifying one, it is at once perceived, when looking at any object through them obliquely, that a great degree of displacement of such object takes place; and when this combination is placed at the position of the diaphragm of the lens, the oblique rays are transmitted to the objective with such a degree of increasing expansion as to overcome or neutralise the contraction or compression that would otherwise take place in the absence of such an expedient.

The distance apart of the two correcting lenses should be determined by trial, for it is not arbitrary except for any one objective. It is desirable that they be mounted in the following

\* A Communication to the Camera Club Conference.



manner:—Procure a piece of tube about an inch long, and of such diameter as to fit into the hood of the lens. Into the end of this is set the concave lens. Into the other end fit the other lens, under such conditions as to provide for a slight movement, so as to increase or diminish the separation.

One such corrector will serve for a great variety of lenses of different foci, to which end it is desirable to have the means of effecting the separation just mentioned, because such is their power for correcting distortion that by their adjustment not only may the distortion of contraction—or barrel-shaped distortion—be cured, but even that of an opposite nature be induced.

I do not advise the employment of this corrector for either landscape, portrait, or group work, when a single cemented lens is made use of for such purposes—for as I have said, the fewer the reflecting surfaces in an objective the better—but only when the photographer is confronted with an architectural difficulty in the form of a building which is to fill or nearly fill his plate. Drawing his corrector from his pocket, and inserting it in front of the lens diaphragm, he thus extemporises a lens which is quite free from distortion. As the cost of these lenses is so little (2d. each was the price I paid) one can afford to keep a few beside him for experimental purposes.

In working with them, I have not found any disturbance of the chemical and visual foci, but the resulting pictures have invariably been sharp. This, too, was the experience of the late Mr. Cole, the architect, who always employed lenses corrected in a manner analogous to that now recommended, and his work was noted for its sharpness and delicacy.

But, you will say, I am merely describing a triple lens, such as at one time was a commercial production. Yes, in one sense it is; but whereas the triple was an objective complete in itself, each of its components being achromatised, this fulfils the function of the triple at a nominal cost, is applicable to any lens, and leaves the landscape lens always ready for fulfilling its special function in pure landscape work. Still, I am only describing it as an expedient for those who do not possess special appliances for special work, which, of course, are always to be preferred.

#### A NEW FORM OF SENSITOMETER.

BY W. F. DONKIN.\*

THE principle of the sensitometer I am about to describe is that of the pinhole camera. The idea of applying this principle to sensitometry is due to Mr. A. Vernon-Harcourt, who suggested it to me last April. I then made a few rough experiments, which seemed promising, and have lately continued them more carefully; and, though they are by no means complete, I have arrived at results which prove the applicability of the principle.

If we take a camera with a pinhole instead of a lens, and place a lighted candle in front of it in an otherwise dark room, so that the image of the candle-flame falls on the sensitive plate, we shall obtain a visible image on development of greater or less intensity, the intensity varying with several conditions. Thus, it is obvious that the intensity of the image will be increased (1) by a longer time of exposure; (2) by a brighter light; (3) by a larger pinhole; (4) by a shorter distance between the pinhole and the plate; (5) by variations in the development; and lastly, by greater sensitiveness of the plate. It is plain, also, that we may take values for the first five conditions, such that with a plate of a certain sensitiveness, an image is obtained only just strong enough to be visible. If, now, we make another pinhole a very little smaller, keeping all the other conditions constant, we shall obtain no visible image at all. A more sensitive plate, however, would give a visible image with the smaller pinhole. Suppose, then, we make a number of pinholes—say 25—in the front of the camera, of graduated sizes, a series of images of the single candle-flame will be obtained by one exposure, and the number of images visible on development will be proportional to the sensitiveness of the plate, provided all the other conditions are kept constant. Such an apparatus—a simple pinhole camera with 25 holes—constitutes the sensitometer I have the honour to bring before you. It is convenient to make the smallest hole about .001 inch in diameter, and the remaining 24 of sizes increasing in a geometric series, such as that adopted by Mr. Spurge in his sensitometer, in which every third hole doubles in area. The convenience of this system is that it gives results comparable with those obtained by means of sensitometers depending on absorption of light in passing through layers of a medium the thickness of which varies in arithmetical progres-

sion, such as Warnerke's. The following table gives the actual diameters in inches of the holes (approximately circular) in my sensitometer.

No.	Diameter.	No.	Diameter.
1 ... ..	0.0610	14 ... ..	0.0143
2 ... ..	0.0570	15 ... ..	0.0127
3 ... ..	0.0608	16 ... ..	0.0113
4 ... ..	0.0452	17 ... ..	0.0101
5 ... ..	0.0403	18 ... ..	0.0090
6 ... ..	0.0359	19 ... ..	0.0080
7 ... ..	0.0320	20 ... ..	0.0071
8 ... ..	0.0285	21 ... ..	0.0064
9 ... ..	0.0254	22 ... ..	0.0057
10 ... ..	0.0236	23 ... ..	0.0051
11 ... ..	0.0202	24 ... ..	0.0045
12 ... ..	0.0180	25 ... ..	0.0040
13 ... ..	0.0160		

By making the distance between the holes and the sensitive plate 2.5 inches, by giving a uniform exposure of thirty seconds in all cases, by using candles of the same composition, and by developing always in the same way, very constant results may be obtained. It is to be observed that no mention is made of the distance between the candle and the sensitometer. It simply does not matter; the distance may be varied within wide limits without affecting the result. It is, of course, true that the intensity of the light falling on any particular pinhole varies inversely as the square of the distance of the candle from it; but the size of the image on the plate varies in the same ratio, and, consequently, its brightness remains constant. Now, it is only the brightness of this image that is measured, and not the total quantity of light. This is easily proved by using two candles instead of one, and placing them at different distances from the sensitometer, taking care, however, that the images do not overlap. Each candle will give the same number of images, and the same as if it had been employed alone. Hence, all that has to be considered in regard to the source of light employed, is its intrinsic brightness. It would, doubtless, be possible to use magnesium; but the exposure would have to be inconveniently short, and the excess of blue rays is too great. For many reasons, candles are most convenient. Candles vary considerably as regards the quantity of light they emit, and this is true even of those parliamentary candles, which are still the only legal standard of light. I do not know whether the relative brightness of various candle-flames—as distinguished from the total light emitted—has been the subject of investigation, but it is at least probable that, with candles of the same composition, the brightness of the flame is more constant than the total light. I would suggest always using the best paraffin candles with this form of sensitometer, as being easily obtainable.

The only part of the sensitometer that is difficult to make is the perforated plate. After trying various methods, I succeeded best with the simplest. I began at first with carefully made little drills and a lathe, but now I find a few ordinary needles and an oil-stone all that is necessary in the way of tools. A micrometer of some sort is, of course, necessary to measure the holes when made. I use tin-foil for the smallest holes, making a number of holes in little bits of foil, and picking out those of the right size and gumming them on a card with twenty-five larger holes punched in it. For the larger sizes I use thin aluminium foil, and find it an admirable material. It would, doubtless, serve equally well for the smaller sizes. Having got the plate made, the next thing is to keep it clean and free from dust. It should be examined with a magnifier before use, and, if necessary, lightly brushed with a fine camel's-hair brush. Although the distance of the candle is theoretically of no importance, practically it is convenient to place it about eighteen inches or two feet from the sensitometer. Images of a sufficient size are thus obtained, while the divergence of the rays is not great enough to introduce sensible error.

In conclusion, I show examples of the results obtained with this sensitometer.

#### ON A FURTHER DEVELOPMENT AND SIMPLIFICATION OF THE STANDARD OF COMPARATIVE EXPOSURES PROPOSED BY DALLMEYER.

BY T. DALLMEYER.\*

As far as I was able to gather, the impression produced by Mr. Cadett's paper on my proposed standard, read before the Photo-

\* A Communication to the Camera Club Conference.

\* A communication to the Camera Club Conference.



graphic Society of Great Britain, was, that the advantages claimed for it were generally admitted, and the only drawback was that it had not been suggested before. With regard to the objection, I can only point apologetically to the fact that, so far as I am aware, no opticians were present when the committee was appointed to determine the standard that was eventually adopted by them. I understand the leading opticians hesitated before adopting a standard system that would involve an entire change in the methods of notation that had been adopted by them for years, and that were generally understood by those who employed their lenses as a sufficiently accurate guide for exposure.

Of late years the rapid strides made in dry-plate photography have practically necessitated the adoption of one standard for exposure which should be universally adopted by opticians for the ready comparison of lenses of different make, whether English or foreign manufacture. In this hope I suggested a standard that might, and I hope will, eventually become so.

Speaking of photographic lenses generally, as regards their rapidity under the conditions in which they are used, every intelligent photographer speaks of his lens as working at such and such an intensity— $\frac{f}{\text{so and so}}$ . This fact led me to adopt

the standard referred to; for a standard, to be of any use or intelligent meaning, should have direct reference to the intensities of the various stops or lenses under notice for comparison. It can be easily understood that whatever intensity be chosen as the standard unit for reference (if the fraction selected for intensity be neither too large nor too small to give cumbersome figures in the standard numbers themselves), a convenient set of figures can be obtained, as is the case in the P. S. of G. B. standard—viz.,  $\frac{1}{4}$ . However, no standard unit can intelligently express intensity at the same time unless it be a decimal system in which the relative exposures are an exact expression of the intensities to be compared.

It is hardly necessary to explain to this gathering that in order to compare any two intensities for finding their relative exposures, it is only necessary to square the denominators of the fractions expressing those intensities; and I contend that the simplest of all standards that can be adopted is to leave these numbers exactly as they are, except for one reason—viz., that they are somewhat cumbersome; but, to obviate this, I insert a decimal point, or, in other words, divide by ten, and a direct, clear, and intelligible reference to the intensities themselves is still maintained. I may mention here that this necessitates a somewhat ugly-looking standard unit—viz.,  $\frac{1}{\sqrt{10}}$  which, not

possessing so pretty an appearance as the fraction  $\frac{1}{4}$  adopted by the P. S. of G. B., seemed at first to weigh heavily in the balance of conservatism. It is evident that if the latter standard be adopted, to arrive at the standard numbers, the relative exposures will have to be divided by 16, for reference to the standard unit of that system, and can have no direct reference to the guide for all exposures—viz., intensity itself.

The next point to which I have to call your attention is the further development and simplification I have made since Mr. Cadett read his paper.

It is this: that in the first list that I published of the relative exposures for lenses, I maintained for lenses that were in current use the same diameters of apertures in the diaphragms, and merely altered the notation of the stops in accordance with this standard. It has since occurred to me that it would be more convenient to photographers generally were I to adopt only certain definite standard numbers or relative exposures, which should be readily comparable within sufficiently wide limits of intensity. I would now refer you to the diagrams. The numbers chosen are twenty-five in number, but, of course, if it were deemed necessary, additional numbers could be added, which again should be easily compared with those already chosen. The use of the diagram, which is to half-scale, will be readily understood. The ordinates have reference to English inches or centimetres, and the abscissæ are relative distances according to the intensity required to be expressed. The diagonal lines drawn to meet these (on opposite sides of the central line, to prevent over-crowding) meet these various intensities or standard numbers at the distance placed for the given focal length decided upon for the drawing made.

The use of the table explains itself, *c.g.*, supposing a photographer has a lens of any definite focal length, he has merely

to place a rule at right angles to the central line and measure the distances at which the diagonal lines meet this, and forthwith obtain the data he requires to give him certain chosen intensities or standard numbers. This diagram being drawn to half scale, and the distances of any diagonal from the central line for any focal length being constructed to give the semi-diameter of the stop, it is evident that for lenses of short focus, the apparent crowding of lines at the apex is immaterial, for to obtain the absolute diameter of the stops on the diagram itself, the focal length of the lens should be multiplied by four, when the exact diameters are given on the diagram.

In conclusion I would say that although the suggestions for alteration which I have adopted myself have been attended with considerable inconvenience as a manufacturer, I trust that the effort may be appreciated, at any rate in the sense that it is not made from any other motive than to simplify and lessen the labours of the photographic world.

## CENTRIFUGAL FORCE APPLIED TO EMULSION MAKING.

BY ANDREW PRINGLE.\*

AFTER an emulsion is formed by double decomposition in gelatine, the bye-products, consisting chiefly of nitrates, have to be eliminated. Further, after the process of digestion and boiling resorted to to increase the sensitiveness of the silver haloid, the gelatine used in the cooking process is in a state of partial or complete composition, and has no only in many cases lost its power of setting, but has in most cases an abnormal tendency to form mysterious and dangerous combinations with some of the salts present, especially under treatment with alkalis.

Some processes of washing eliminate more or less completely the nitrates, some eliminate the gelatine, some successfully eliminate both nitrates and gelatine. The ordinary washing process eliminates the nitrates practically, and, if carefully performed, may be said to eliminate them completely. But the decomposed gelatine, or the gelatine just on the verge of decomposition, being probably more or less bound up in the mass of gelatine undergoing washing, is presumably not removed by ordinary washing, and, what is more serious, the bulk of healthy gelatine takes up an indefinite quantity of water in the washing, the quantity depending on such matters as the nature of the gelatine, the state into which it is divided, and the temperature of the washing water. Moreover, the process of partially drying the jelly after washing by squeezing it or allowing it to drip, involves an amount of uncertainty not less than that involved in the actual washing.

The precipitation-by-alcohol process has also its defects. The coagulated gelatine is with great difficulty or not at all permeated by water, and it probably binds up a considerable quantity of the nitrates in its substance. At all events, a precipitated emulsion requires to be divided into very minute particles—an awkward and unpleasant operation at the best—and, further, needs very prolonged washing to free it from nitrates.

Other methods depending on precipitation are, in my experience, either unaccountably uncertain or rascally dangerous to the emulsion. Adding ammonia to the cooked emulsion sometimes sends down the bromide, sometimes it does not, and sometimes it is very difficult to tell in the dark room whether the silver bromide is down or not. Acids, such as acetic, send down the silver bromide by viscosity of the gelatine, and by this method I have washed many an emulsion, but I have invariably found that the emulsion has been slowed or otherwise damaged by this treatment.

The method of eliminating bye-products and decomposed gelatine which I propose to discuss is that of centrifugal separation—first, I believe, suggested by Mons. Plener; afterwards advocated by Mr. A. L. Henderson. The process and the machinery are both open to the public.

The requirements for centrifugal separation are, as far as we are concerned, a liquid containing a solid substance or substances not in solution, and an apparatus for causing very rapid revolution. In our case the liquid is water holding in solution nitrates and gelatine; the solid matter not in solution is silver haloid. Now, when liquids contain solid matter not in solution, the solid substances, on centrifugal force being brought to bear, fly outwards from the centre of oscillation with a force and velocity proportionate to their density or specific gravity, the denser

\* A communication to the Camera Club Conference.



solids flying outwards more quickly and more strongly than the lighter solids. The substances in solution remain so, and simply fly round with the liquid.

I cannot, for want of time, give more than one example of the power of centrifugal force. If a stick 2ft. long oscillates on its centre in a horizontal plane at the rate of 3,000 per minute, and if at each end of the stick there be a bucket containing, say, emulsion, the whole at each end weighing 20lb., taking the foot as the mean radius, the centrifugal force at each end of the stick will be nearly 28 tons. We do not use sticks, but drums, and the mean radius is not often over 6 in.; but it is easy to see how strongly made the separating machine must be.

Having cooked our emulsion, and so made it sensitive, or, in other words, having so brought our silver haloids to a state of coarse division, we place the emulsion in the drum, and cause the drum to rotate at a certain speed for a certain time. As I am addressing amateurs, I will confine my attention to the smallest size of "drum" made, which has a diameter of 4½ in. or thereabout. We can make this rotate about 4,000 times a minute without any very violent exertion; still on a very hot day one does not wish to repeat the operation many times.

The time and speed required for separation depend on (1) the state of division in which the haloids are. The larger the grain the quicker the separation. I can make a very close guess at the rapidity of my emulsion when I examine the drum after separation. (2) The quantity of gelatine present. The more gelatine the longer the separation required. (3) The temperature of the emulsion. The higher the temperature the more easily is separation effected, but there are limits of temperature beyond which we should not go.

I believe that over-separation is the cause of nearly every failure by beginners. It was invariably the cause of my early failures. Over-separation leads to poor, foggy, slow, rank bad emulsion, and the quality of gelatine necessary to make it a thick emulsion, even in appearance, has always puzzled me. With an emulsion cooked to an extremely sensitive state, I find two minutes at a fair pace ample for complete separation, so far as we require it. So far as I can discover, the healthy gelatine goes to the side of the drum, finding together, to a certain extent, the particles of silver bromide, &c., while the gelatine that has been decomposed and has lost its setting power remains dissolved in the water, and is poured off later. This much I know, that I have repeatedly put into the separator an emulsion giving scarlet and other fogs, and after separation the fogs have disappeared; and it seems to be generally agreed that some kinds of fog are due to a combination between decomposed gelatine and silver, though what the precise combination is nobody can say. A less-cooked emulsion should be separated at a higher temperature, and, if convenient, with less gelatine present, than a very sensitive emulsion. *Ceteris paribus*, a sensitive emulsion will adhere more closely to the sides of the drum than a slower one. When, after separation, the liquid is poured off, it ought to be examined in the palm of the hand; it will be easy to tell whether separation has been sufficient, insufficient, or overdone. If the liquid is almost clear or only milky, with no sign of deposit on the hand, the odds are separation has been overdone. If it is creamy or sticky to any extent, and if there is found a considerable quantity of "grit" in the palm, the best way is to give it another dose of separation. If it is milky, and a slight deposit is seen on the hand, it is probably a good emulsion, so far as separation is concerned. The drum is gently rinsed once with cold water, and the bulk of the gelatine necessary to complete the emulsion having been soaked for short time in water is used as a mop to remove the deposit from the sides of the drum. In the dark room it is not always easy to say when the whole of the deposit is removed, and a rapid emulsion will probably be more consolidated and more difficult to remove. One of the strong points of the process is that we have only a known quantity of silver haloid, a known quantity of gelatine, and a known quantity of water to deal with, so that our emulsions may be made always alike—in these respects, at least. The bulk of gelatine is soaked in the required quantity of water, and that water is measured beforehand, and used later as the solvent of the entire emulsion. No silver goes down the sink, for any minute quantity washed accidentally out of the drum is added with the rejected liquid to the residues. I once separated an emulsion containing precisely 125 grains of silver bromide. After separation, I kept the liquid, decanted, dried, weighed the precipitate, and found less than one grain, and some part even of that must have been nitrate.

## Patent Intelligence.

### Applications for Letters Patent.

- 3,177. WILLIAM RICHARD WYNNE, 40, Chancery Lane, W.C., for "Improvements in levels for photographic cameras."—March 2nd, 1888.  
 3,196. JOHN WILLIAM RAMSDEN, 2, East Parade, Leeds, Yorkshire, for "Improvements in tripod stands for photographic surveying and other purposes."—March 2nd, 1888.  
 3,259. JOHN PLACE, 12, Cherry Street, Birmingham, for "Improvements in photographic shutters."—[Complete Specification.]—March 3rd, 1888.  
 3,352. EDMUND JOHN PASSINGHAM, Sunbridge Chambers, Bradford, Yorkshire, for "A new and combined apparatus or desk for retouching photographs."—March 5th, 1888.  
 3,424. ARTHUR HENRY BATEMAN, 115, Cannon Street, London, for "Improvements in photographic apparatus."—March 6th, 1888.  
 3,615. Sir DAVID LIONEL SALOMONS, Baronet, 24, Southampton Buildings, London, W.C., for "A slide-rule for photographic purposes."—March 8th, 1888.

### PHOTOGRAPHIC COPYRIGHT IN JAPAN.

The following new law in relation to photographs is given by the *Photographic Times* of New York as from the *Japan Daily Mail*:—

IMPERIAL ORDINANCE No. 79.—*Photograph Copyright Regulations.*

Art. 1.—Any representation of the human figure, of implements, of views, or of any other object, taken by means of light and of chemicals, shall be called "a photograph"; and the right of exclusively enjoying the profits arising out of the sale of photographs shall be called "the photograph copyright."

Art. 2.—Copyright shall belong to the photographer who has taken the pictures, and, after his death, to his heir. But in the case of photographs in safe keeping for other persons, the photograph copyright shall belong to the person for whom the photographs are so held, and, after his death, to his heir. In the case of photographs held as above by a photographer, the copyright-holder may demand from the photographer any of the original plates still in existence.

Art. 3.—Any person desiring to receive protection for photograph copyright shall apply, previous to the publication of the photograph, to the Department of State for Home Affairs for the registration of his copyright, at the same time sending to the said Department of State two specimens from each plate and an amount of money corresponding to a money value of six of the photographs. Photographs of human forms shall be entitled to protection even before registration.

Art. 4.—During the period of protection, the name of the copyright-holder, his address, and the date of registration shall be inscribed on the photographs for which the registration of copyright has been made. When these particulars are not set forth, the photographs shall lose the effect of registration.

Art. 5.—In the Department of State for Home Affairs there shall be kept a photograph copyright registration-book, in which entries shall be made whenever application is made for registration; and a certificate of registration shall be issued to applicants for the same. What regards certificates of registration of photograph copyrights shall be similar to what regards certificates of registration of copyrights of literary works and of pictures.

Art. 6.—The period of protection for photograph copyright shall be ten years from the month in which the registration was effected.

Art. 7.—A photograph copyright may be sold or transferred with or without conditions.

Art. 8.—To take reproductions of a photograph, the copyright of which is protected, or to produce imitations by a method resembling photography, by which a large number of pictures can be taken by means of a mechanical or of a chemical process, is prohibited. Photographers are also prohibited from taking, without the consent of the copyright holder, or of his heir, extra copies of the photographs entrusted to their care.

Art. 9.—Any person who shall have falsely alleged a registration of copyright without having gone through the process laid down in Article 3, shall be liable to a fine of not less than 2 yen and not more than 20 yen.

Art. 10.—Any person who shall have violated Article 8 shall



be regarded as a counterfeiter in accordance with the copyright regulations, and shall be liable to a fine of not less than 20 *yen* and not more than 200 *yen*. He shall also be obliged to pay an indemnity for damages. The term of prescription for the obligation to pay such indemnity for damages shall be one year after the expiration of the period of the copyright of the original photograph.

Art. 11.—The period for public prosecution in connection with the present regulations shall be one year, and shall be computed from the time that the photographs or the imitations, which shall have been recognized as unlawful, were produced. In case the photographs or the imitations have been sold, the computation shall commence from the time of the last sale thereof.

Art. 12.—The provisions mentioned in the Criminal Code for the mitigation of penalties on account of voluntary confession, for the aggravation of penalties, on account of repetition, and for the concurrence of several infractions committed by the same person, shall not be applied in the case of the violation of any of the provisions of the present regulations.

## Correspondence.

### CRYSTAL PALACE AWARDS.

SIR,—Some curiosity has been expressed as to the merits for which the medals for apparatus have been awarded at the Crystal Palace Exhibition.

We think it may help to elucidate the matter if we state that out of three different series of lenses we had on exhibition, two of these, including a portrait rectilinear series, full aperture, were not even taken out of our case for examination; and that of the other series—one lens only—was removed for a space of time far too short for any adequate tests to have been applied.—We are, yours truly,  
R. & J. BECK.

### FRENCH INSURANCE COMPANIES.

SIR,—Thanks for citing my unhappy case in your valuable journal. I hope it will be a warning to your readers not to make a treaty with a French Insurance Company.

Enclosed please find a precise account of the general doings of French Companies.

(From a Parisian Journal, *The XVII Arrondissement*.)

A great scandal will soon come on in Paris. An Englishman, dealer in photographic appliances, insured his stock-in-trade for 60,000*f*. Everything was burnt or destroyed by fire, smoke, or water.

The ordinary system employed by French Companies was carried on. Two experts were named, one by the Company, the other by the insured. During this time, taking advantage of the absence (through illness) of the insured, the Company sent agents pretending to seek in the establishment until a settlement had been arrived at, no work could be done, thus trade and customers are lost, &c., &c. In going to law 'twill be the history of "*Le pot de fer et le pot de terre*." The judges themselves are our shareholders, said he, and are always favourable to the rich Company who can pay. Moreover, said he, our lawyers will find a flaw in the policy, and will not give a sou if a lawsuit is carried on. Although all these insinuations and threats were held out, the British blood of the victim would not give in, and called aloud for justice (much to the surprise of the Company, who is

not accustomed to such tenacity), and exacted that a third expert should be named.

A third expert was nominated, and before he began his duties the photographic dealer overheard a conversation between him and the expert of the company, in which the latter offered the former, on the part of the Company, 10 per cent. on all he could cut off the demand. Expertise begun. The victim soon saw by the ways and doings of the new expert, that not only was he completely ignorant of the trade, but that he was in the interests of the Company. So evident was this that the expert of the Company kept aloof all the time. This he would not have done had he not been sure of the man. Otherwise he would have discussed each article. Letters to denounce the ignorance and doings of this expert were sent on, but of no avail. He only came twice, in all three hours, and requested to be paid 1,200*f*. for his trouble. Refuse to comply on the part of the victim, the Company illegally paid him at once. Consequently his expertise was useless. Goods scarcely unpacked, together with new stock, he cut down (although the invoices were shown) 35 per cent. as depreciation. Could anyone but a French expert imagine a depreciation on new articles ready for sale?

Now what is the result of all this? The fire occurred in the beginning of the year. A law-suit is pending. The Company to gain time and in vengeance, and on the most frivolous pretext, have sent a demand of forfeiture against their customer. Consequences to the victim:—Impossibility to touch anything in the establishment until the case is settled. 1st.—Since ten months the house is a ruin; trade and customers lost. No compensation for that. 2nd.—A mortgage on the dwelling must be paid by the victim, although a ruin. No compensation for that. 3rd.—Loss of income, ten months, value 18,000*f*. No compensation can be claimed. 4th.—The victim having sunk all his and his wife's fortune in the business, the whole family are in the deepest distress. Friends obliged to advance funds to procure food.

It is scandalous and heartrending that an Insurance Company should have the power on the most frivolous pretext to refuse to pay claims on them, and so manage to elude for years the payment, in order to drive their victim to accept, in the long run, a paltry sum in order to keep from starvation.

Such are the ways and doings of the French Insurance Companies. They have conditions printed in microscopic type on their policies with the insured. These conditions are so worded that every policy is a snare to entrap the unhappy victim of a fire. An Englishman can hardly credit the truth of such accusations.

In order to convince our readers that our friend and countryman's case is not an isolated one, we cite an article on the Prado fire, which appeared on the 13th of March, 1887, in the *Journal du XVII<sup>e</sup> Arrondissement*:—"When a fire breaks out everybody gives advice. Some say let everything be burnt. Others give their opinion that 'tis better to save as much as possible. Which, then, is the best? Neither; because in each case 'tis the victim who pays in the long run. This is what happens 90 times out of 100. When you are owner of anything you wish to have it insured. To do so you have every confidence in an insurance agent, who explains to you in a few words the best combination, that is to say, that which will make you open your purse strings to pay yearly the highest premium he can advise you to pay. He presents you a printed form to be filled up by hand. 'Tis the same form for everybody. You sign it in confidence after having looked at the total, and you imagine you are insured for that sum. Effectively, in your true and honest judgment, you think, if all I possess were to burn I should lose so much; it is, therefore, that sum which I must insure. The figures representing that sum are written down upon the deed, and you are therefore tranquil as to the future. Months, years pass by; you pay regularly the premium of your risk. All of a sudden a fire breaks out, and your house is destroyed. All is burning. Excited you jump about like a devil in holy water. You rush into the flames and save as many objects as you can from destruction, valuables, pictures, linen, &c., &c. You say to yourself, I have saved very much, the Insurance Company will be very contented. Ah! You think so! 'Tis now that the little estimation of the Company begins. You were insured for 10,000*f*., says the agent; you have saved, according to our estimation, 9,000*f*.; therefore we offer you 1,000*f*., with a depreciation of so much per cent. If, on the contrary, you allowed all to be burnt, 'tis another argument the Company employs. You think within yourself, as nothing remains, the Company will pay me the entire sum for which I was insured. Calculate on this, you will drink



nothing but water for the future. The Company makes an estimation. You insured your property for 10,000*l*. You are requested to justify and prove that such a value was in your habitation. Your bills of purchase were burnt. Ask your tradesmen and contractors for copies from their books, says the Company. An inspector is sent, who contests the existence of the goods you possessed. He and other agents turn over everything, scrutinize, take notes of your words and those of persons surrounding you; in other words, begin, as it were, a kind of criminal interrogatory, having for object to reduce as much as possible the sum which the Company has to pay. When all is ripe, the Company very generously offer you the fourth or the fifth of what you have lost. Naturally you make a clamour, and refuse to accept the sum offered. The Company nominates an expert, and you name another to defend yourself. These two never agree. A lawsuit is the consequence.

These rich companies pride themselves upon the fact that the magistrates and judges are their shareholders; I have learnt this to my cost. In fact, fifteen months ago I had a splendid factory; to-day I am without the means of doing anything. From a proprietor I must become a journeyman.

I have lost on my stock ...	25,000 <i>l</i> .
" " " business ...	30,000 <i>l</i> .
" " " one year's time ...	12,000 <i>l</i> .
	67,000 <i>l</i> .

PROF. E. STEBBING.

59, Rue des Batignolles, Paris, March 3rd.

## Proceedings of Societies.

### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE ordinary monthly meeting of this Society was held in the Gallery, 5A, Pall Mall East, on Tuesday, the 13th inst., the President, J. GLAISHER, F.R.S., in the chair.

The reading of the minutes of the annual meeting and of the special meeting for the consideration of the new rules to be adopted by the Society having been read and confirmed,

THE PRESIDENT said that before passing to the business of the evening, he wished to hand round for the inspection of the members two photographs of lightning flashes. One, which was the best photograph of a lightning flash that he had ever seen, was taken at Tours, in France, by H. Schleussner and E. B. Vignoles on May 22nd, 1886; and the other, which was a remarkably good photograph of the kind, was taken by Mr. Davis, at Dover, on July 18th, 1887.

T. SAMUELS called attention to the omission in the annual report of any mention of the late exhibition.

THE PRESIDENT said that was a matter to be brought before the Council, and not a meeting of the Society.

J. R. DALLMEYER then read a paper on "Depth of Focus and Diffusion of Focus," in the course of which he said that perfect depth of focus was only possible with a pinhole camera. With a lens perfectly corrected absolute depth of focus did not exist. According to the law of conjugate foci, an image of a subject in one plane being rendered on to a given point, an object on any other plane would be rendered on some other plane than that on which the first object would be in focus. It was an impossibility to focus on one plane two points which were on different planes. There was, however, a limit of want of sharpness, within which the image was practically sharp, and that limit was a circle of confusion of  $\frac{1}{100}$ th of an inch in diameter. It was possible, therefore, by a calculation (which he illustrated on the black board) to calculate what must be the size of the diaphragm or aperture to ensure, with a lens of given focal length, and with objects at given distances, that the circle of confusion should not exceed the limit which had been referred to. One of the formulae on the board had been published some year or so ago by Sir David Salomons; and from it, it was apparent that depth of focus can only be obtained by diminished aperture. The general formula would be better to look through at leisure. It would be evident from what had been shown that it was absurd to speak of some lenses having more depth of focus than others. As to diffusion of focus, a pinhole camera gave diffusion of focus with uniform depth of focus; the picture was produced throughout by small circles of confusion. Diffusion of focus was obtained

by the introduction of positive spherical aberration, and this was of practical utility; but for a lens to be practically useful, this power of introducing spherical aberration must be under the command of the photographer, and this was achieved by means of separating the elements of the back combination as much or as little as might be desired. In portraiture, if you use a perfectly corrected lens, you obtain sharpness in one plane, and want of sharpness in others; whereas, by introducing a certain amount of positive spherical aberration, you have similar circles of confusion and a general softness, whilst in the former case there is a lack of harmony.

W. E. DEBENHAM said that it was sometimes as useful to expose or refute a fallacy as to proclaim a new fact. There was and had been a fallacy current amongst photographers as to the supposed property of some lenses of having depth of focus. He thought that it should be generally known that depth of focus was not a function of the lens at all, but of the aperture. Some twenty-one years since, the late Mr. J. H. Dallmeyer, in bringing before this Society the lens with the means of bringing in spherical aberration at will, had claimed that he thus obtained better definition in the planes out of focus, not only relatively, but absolutely. That claim had been refuted by the late Thomas Grubb, in a paper and diagram which appeared in the *British Journal of Photography* on February 8th, 1867. It was there shown that by introducing spherical aberration the definition was lowered throughout. He believed that no attempt had been made to answer or call in question Mr. Grubb's demonstration. He wished photographers to know the fact that by sacrificing definition at the focus they did not obtain better definition elsewhere, but the contrary. If, knowing this, they were contented to put up with less definition everywhere for the sake of getting rid of sharpness at the focus, that was a matter for their own consideration. He was glad that it was no longer claimed that better definition in the out-of-focus planes resulted from giving up fine definition at the focus, but he went further, and maintained with Grubb that the definition was injured throughout. He concluded by giving an extract from Grubb's paper: "In short, in whatever way we make these comparative measurements, provided it be done fairly, we shall find the advantage with respect to depth of focus to be on the side of the corrected lens."

G. L. ADDENBROOK would like to explain what he understood by depth of focus, that with some lenses the definition was only good in the centre of the field, with others there was definition within the limit of  $\frac{1}{100}$  of an inch, which was considered permissible, at some distance from the centre.

W. E. DEBENHAM observed that that was not a question of depth of focus, but of curvature of field, or of astigmatism.

T. SEBASTIAN DAVIS said that definition had much to do with curvature of field. In the early days of photography opticians sedulously endeavoured to obtain the utmost sharpness at one point. Dallmeyer, however, brought about the diffusion of focus over an approximately flat field by the introduction of a negative lens between the positive lenses, and this was the triplet. He desired to bring the subject forward for the special purpose of mentioning that he had lately been using two lenses for transparency work in the camera. One was the 2*½* lens by Dallmeyer, and with this he could work satisfactorily, and obtain definition at the margin of the picture; whereas, with another lens by the same maker, made expressly for transparency work with the lantern, and possessing no colour to interfere with the display of slides, he could not get satisfactory definition at the margin.

SIR DAVID SALOMONS said the calculations for depth of focus could all be obtained from the second formula given by Mr. Dallmeyer, which was the one he had published. He did not at all agree with Mr. Dallmeyer that diffusion of focus was an advantage. The moment he got any amount of diffusion, something appeared which he did not like. He therefore, when using the lens which would give diffusion when unscrewed, always screwed it up to the position of perfect definition. The only successful way for large heads was the old way of moving the lens backwards and forwards. It had been objected that by this means the size of the image was altered, but he had not found this to be sufficient in amount to be practically injurious, and he obtained microscopic definition of both nose and ear. There was, however, he believed, a way of moving the components of the lens, so that the image would remain of the same size, although the focal plane was altered. He hoped shortly to be able to read a paper on the subject.

V. BLANCHARD would not attempt to go into the optics of the



subject, which he did not understand, but would deal with lenses as instruments for producing artistic effects. He considered that there was an immense difference in lenses in the power of giving depth of focus. Many years since he worked with a single lens, which was, in fact, the front lens of a French portrait combination, and obtained the results that he wanted. He showed the lens to the late Mr. Dallmeyer, who observed that the tube was evidently long enough to act as a stop. He objected to the painful sharpness which a perfectly corrected lens gave, and he and the late T. R. Williams asked Mr. Dallmeyer whether he could not construct such a lens as they required, and the result was the lens which had been referred to that evening, and which for 5 inch heads he used with the diffusion arrangement screwed out to the utmost.

J. R. DALLMEYER, replying, said that with the exception of Mr. Debenham and Mr. Blanchard, the discussion had seemed to turn rather on flatness of field than on depth of focus. One point that seemed to have escaped notice was that the lens to which he had referred will give perfect definition when screwed home, and that the diffusion of focus can be introduced and regulated at the will of the operator. As to Mr. Debenham's quotation from Mr. Grubb, he did not enter into that question. As to the relative advantage of moving the lens and introducing positive spherical aberration, with the latter there was a sharp point surrounded by a halo, which gave softness. The halos ran into one another, and so produced softness.

The PRESIDENT, in proposing the vote of thanks, which was carried, said that he recollected working with Clandet with the moving lens, and he was gratified to find the subject, which he had supposed to be forgotten, coming up again.

It was announced that the next ordinary meeting would be held on the 17th of April, the third Tuesday in the month, instead of the second Tuesday, as was customary.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A SMOKING concert was given on the 8th inst., in place of the ordinary technical meeting, under the direction of the HON. SEC., who occupied the chair. The programme included recitals, songs, and instrumental solos, ably contributed by R. Collier, Lewis Smith, Arthur Weston, A. Glover, F. G. Read, A. Cowan, A. Cowan, Jun., G. Leopold, F. Donald, Stuart Lane, H. Adams, C. Wood, and the Brothers Lang; accompanist, H. S. Starnes. A large number of members and friends were present.

#### CAMERA CLUB.

On Thursday, March 8th, a paper on "Detective Cameras" was read by A. R. DRESSER. D. P. ROGERS occupied the chair. Mr. DRESSER mentioned several kinds of detective cameras and their details of construction, and gave his experience in instantaneous photography.

In the discussion, cameras were shown and described by Messrs. Beck, Rouch, Robinson, and Bolden, and remarks were made by Messrs. Davison, Little, Spiers, and the Chairman.

On Thursday, March 22nd, lantern slides will be exhibited.

#### BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The ordinary meeting of the above Society was held in the Priory Rooms, Old Square, on the 8th inst. There was a large attendance of friends numbering some 450; W. SEPTIMUS HARDING, J.P. (Vice-President) in the chair.

The following gentlemen were elected:—J. H. Manly, W. Manly, W. Taylor, H. Bartlett, H. Coles, A. Darby, J. Gladstone, George Jenkins, W. P. Marshall, J. H. Shoebotham, C. Alston Smith, A. L. Sterne, and W. E. Taylor.

E. H. JACQUES then gave his lecture on Norway, entitled "The Land of the Midnight Sun," illustrated by upwards of 120 dissolving views. Mr. Jacques, in the course of his introductory remarks, dwelt with much enthusiasm on the rare beauties of Norwegian scenery, at present comparatively unexplored, yet forming a vast treasury teeming with gems so dear to lovers of nature. He also spoke of the simplicity, hospitality, and honesty of the people, at present unspoiled by the indiscretions of tourists and requirements of modern civilisation. The views which he had made from negatives taken while on a tour last summer were exhibited on a 16ft. screen by the aid of lanterns specially constructed by J. Pluce, the manipulation being entrusted to Messrs. Fowler and Bonehill. Starting from Colmore Row, an imaginary trip from Birmingham via Hull and Wilson steamer to Christianna, over Lake Mjorsen,

the Gudbrandsdal, and Dovre Fjeld, through the Romsdal to Vebstugsneus, and back via Hull to Birmingham, was represented, all the views being of a very high artistic merit and technical excellence, and were, in nearly every instance, awarded repeated applause; the representation of the Midland express, shipping, moonlight on Lake Mjorsen, and the Romsdal scenery being fine lantern pictures.

The paper for March 22nd will be "Sunshine and Shadow," by A. C. Townshend.

#### SUTTON SCIENTIFIC SOCIETY.—PHOTOGRAPHIC SUB-COMMITTEE.

At the last monthly meeting of the above Sub-Committee held on the evening of the 6th inst., at the Society's Rooms, 18, High Street, Sutton, A. R. WORMALD in the chair, an excellent paper on "Platinotype" was read by A. W. BAWTREE.

The chemical theory of the process was illustrated by various interesting experiments, and its practical working by the development of several prints. Mr. Bawtree found that the use of an exterior hot water bath surrounding the dish containing the oxalate solution tended to maintain an even temperature of the latter more easily than when this was heated directly without such intervention.

A vote of thanks having been heartily accorded to Mr. Bawtree, the meeting proceeded to fill the vacancy in the Recordship through the resignation of J. L. McCaull, by electing H. E. Murchison to the office.

#### A PHOTOGRAPHIC ASSOCIATION FOR IPSWICH.

A MEETING was held at the "Crown and Anchor" Hotel, Ipswich, on Tuesday evening, March 6th, to consider a proposal to form a Photographic Association for Ipswich and District. Dr. J. E. Taylor presided. Among those present were C. K. Cowell, E. Edwards, J. V. Owen, A. F. Penraven, F. Mason, E. R. Pringle, F. Woolnough, J. H. Cade, S. Ransome, &c., the attendance attesting the interest in the proposal. Dr. Taylor laid before the meeting the object and advantages of the proposed Society. He liked to see men with a hobby, especially one with a scientific tendency. It would tend to absorb the energy which otherwise might lead to vicious habits, for vice was only misdirected energy, as dirt was only matter in the wrong place. Photography led amateurs to look about them, and take an interest in nature and its varied aspects, and to preserve reminiscences of places they had visited. He then called upon Mr. Woolnough, who, in a few appropriate words, proposed, "That this meeting form itself into a Photographic Association." A. F. Penraven seconded, and the resolution was unanimously carried. F. Mason moved, and J. Cash seconded, "That the annual subscription be five shillings." The names of those willing to join the Association were then asked for, and twenty-two were given in. E. R. Pringle was unanimously elected Honorary Secretary and Treasurer. A provisional Committee to formulate rules and arrange details was formed of the following gentlemen: Messrs. Adlard, Cade, Woolnough, Cash, Wiggin, and Penraven. It was also unanimously agreed that J. D. Piper be asked to be the President of the Association, and H. H. P. Powles and Frank Mason were elected Vice-Presidents.

#### SHEFFIELD PHOTOGRAPHIC SOCIETY.

The ordinary meeting was held in the Masonic Hall, Surrey Street, on Tuesday evening, March 6th, the president (Mr. Councillor FIRTH) in the chair.

The formal business having been disposed of, Mr. CROWDER asked if nothing could be done to secure to the members a reduced railway fare to places of interest in the neighbourhood, after the principle of the "Fisherman's Tickets."

The CHAIRMAN said the various Railway Companies had been petitioned some time ago, but could not see their way clear to make any reduction. Probably the increase in the number of amateurs since those petitions were presented would add greater weight to any petition if presented now.

The medals won in the annual competition were then presented by the President to the successful competitors, Messrs. Hibbert and J. Taylor.

Reference was made to the success of three members of this Association at the Liverpool Exhibition, Messrs. Hibbert, Taylor, and the Hon. Secretary having obtained four medals amongst them.

Mr. PLATTS then read his paper on "The Stereoscope," which was listened to with marked attention. Having given particulars



of the invention of the stereoscope, and noticing the various kinds of instruments which from time to time have been employed, he gave some interesting particulars on the making of stereographs.

Mr. BARBER exhibited a portable stereoscope, and some American sized stereographs. He stated these photographs were taken on 8 by 5 plates with the lenses 4 inches apart.

Mr. BROMLEY also exhibited a stereoscope and slides which were of excellent quality, and were much admired.

#### NORTH LONDON PHOTOGRAPHIC SOCIETY.

At the ordinary meeting on March 6, J. TRAILL TAYLOR in the chair, James Cole was elected a member of the Society.

Mr. FRESHWATER exhibited a very portable form of oxyhydrogen lantern, which, while containing the most perfect optical arrangements, occupied no more space than was absolutely necessary for the lenses and jet. The jet was a blow-through of very light pattern, but perfect in performance. In fact, the whole arrangement might be described as a "pocket lantern," with more justice than some so-called "pocket" cameras can. Mr. Freshwater then passed through a number of slides, dividing them into three classes—hand-painted, hand-coloured photographic copies from engravings, and hand-coloured photographs from nature.

The PRESIDENT then passed through forty choice hand-painted slides selected from the stock of Messrs. Carpenter and Westley, and lent by Messrs. Perken, Son, and Rayment.

A large collection from the stock of W. C. Hughes followed.

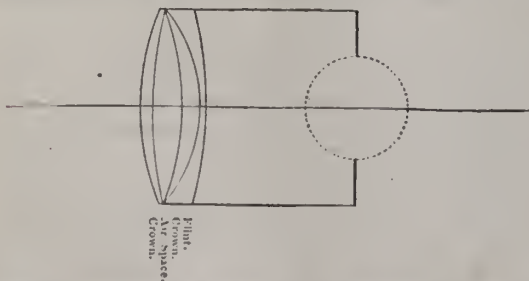
A number of comic and mechanical slides were then shown, the display terminating with a few plain photographic slides of microscopical and landscape subjects. Many of the slides were framed, but during the exhibition of the unframed ones, Hughes's instantaneous carrier was used, the simple and ingenious eclipsing arrangement exciting much interest, although it was generally wished that it could be made to work more quietly.

E. CLIFTON then exhibited and explained James's magnesium flash lamp, which had been sent for that purpose by the patentee.

At the next meeting, on March 20, there will be an informal hand-to-hand exhibition of work by members. Those possessing other photographs of interest are also requested to note that such will be acceptable.

### Talk in the Studio.

DALLMEYER'S NEW RECTILINEAR LANDSCAPE LENS.—With respect to this instrument we may now say that we have additional evidence of its value, a friend who is in the habit of making negatives for photo-lithography having reported in very high terms as to its superiority, as regards brilliancy and clearness of image, to a doublet; it being of course understood that it is only available when a comparatively narrow angle of view is included. With respect to the lettering under the diagram last week, we may call attention to the circumstance that in each case one word indicating the quality of the glass used was spaced too far out towards the East of the plan, thus coming under the dotted circle indicative of the maximum working aperture. In spite of the fact that the accompanying text would make all clear to an attentive reader, we reproduce the diagram of the new lens, and with the words better placed.



PHOTOGRAPHY AND METEOROLOGY EXHIBITION.—The Royal Meteorological Society's ninth annual Exhibition of Instruments,

which will, as previously stated, be held at the Institution of Civil Engineers, 25, Great George Street, Westminster, in conjunction with the Society's meeting on Wednesday, the 21st instant, will remain open till the 23rd instant. The exhibition is devoted to apparatus connected with atmospheric electricity, including lightning conductors, photographs of lightning, and damaged objects, &c. A collection of some fifty photographs of flashes of lightning from various parts of the world will be shown, as well as some curious and interesting effects of damage by lightning, including the clothes of a man torn off his body by lightning, &c. Persons not fellows, wishing to visit the exhibition, can obtain tickets on application to W. Marriott, Royal Meteorological Society, 30, Great George Street, S.W.

HAMMOND'S CYCLE LOG-BOOK.—A compact little volume for the pocket, which, even without alteration, might suit the purposes of the wanderer with the camera. For 6d. we have some 100 pages, all ruled in table form. The size is a convenient one for the pocket, 5 by 4 inches. The publisher is Hammond, 136, Edmund Street, Birmingham.

A DURABLE MIXED AND CONCENTRATED PYRO DEVELOPER.—F. KADERAUCK, of Brünn, gives a modification of Dr. Lohse's concentrated developer, as follows:—

Distilled water	...	...	400 c. cm.
Carbonate soda	...	...	25 grammes
Carbonate potassa	...	...	25 "
Carbonate ammonia...	...	...	10 "
Sulphite soda	...	...	160 "

Dissolve with heat and cool quickly, then add pyro, 18 c. cm. The brown solution is carefully filtered, and kept in a cool, dark place. It keeps a long while. For use, say for cabinet plate, take 40 c. cm. of water, and add 10 c. cm. of the developer. If the plate has been fully timed, the image will quickly appear. The colour of the negative is grey, like that produced by oxalate, affording brilliant prints. If there is any doubt as to exposure, do not add at once the whole 10 c. cm. of developer, but proceed gradually, and have ready the solution of bromide of potassium. For under-exposed plate, add one or two drops more of ammonia (1-20); but it is preferable to reduce the normal developer (10-40) with two or three times its volume of water, and, after all the details come up, to apply fresh, strong developer (10-40), finally strengthening with bromide.—*American Journal of Photography*.

THE SENSITIVENESS OF THE EYE FOR DIFFERENT COLOURS.—According to the recent investigations of Herr H. Ebert, the sensitiveness of the eye varies for different colours. By lamp-light it is by far the greatest for green. After green, the eye appears most sensitive for red, then for greenish-blue, yellow, and least sensitive for blue.—*Scientific News*.

PHOTOGRAPHIC CLUB.—The subject for discussion on March 21st will be "Atmospheric Influence on Exposure."

### To Correspondents.

J. NICKELSON.—The charge of £1 for these negatives taken away from home is a very small one, and it is quite evident that the lady has very little idea of the amount of work involved. That the full amount could be recovered by law we have little doubt. The letter has been returned to you.

F. ROUX.—Only at the address given in the review.

W. K. KENNAN.—We think every reader interested in the matter will recognize at once the worthlessness of the patent.

A. FREYER EVANS.—A photographic objective is usually only corrected for two positions in the spectrum, and ordinarily there would be a little difference, but not enough to be of any practical importance.

P. H. EMERSON.—The further suggestions are valuable, and we shall endeavour to carry them out, and we will write to you.

PYRO.—If the argentiometer registers, the indication will be 48. Perhaps you did not dissolve 960 grains, but only 2 ounces. Nitrate of silver is not sold by the Troy ounce of 480 grains.

O. E. C.—1. The second we have not tried, but do not think there is anything to choose between No. 1 and No. 3. 2. Quite as quick, and, taking an average, about equal in definition. The former, however, gives a less flat field.

J. A. ROBINSON.—The question is so purely a legal one that we hesitate to give any answer; but our impression is that various decisions regarding the point are by no means in accord with each other.

\* \* \* Several Answers are postponed till next week.



# THE PHOTOGRAPHIC NEWS.

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## ENLARGING.

PERHAPS among subjects of ordinary discussion in photographic circles, nothing is so frequently argued and re-argued and presented in its various bearings as that of making copies of photographs on an enlarged scale; and, indeed, now that rapid bromide paper is in the hands of almost every photographic worker, whether amateur or professional, it is the exception to find anyone who has not made enlargements, more or less successful, from his negatives.

The ideal enlarged photograph is the image projected on the screen by a good optical lantern, and indeed no permanent photograph can compare for brilliancy with a well-lighted lantern projection from a suitable transparency. Many amateurs understand this so well that they make a point of never exhibiting to their friends any prints of ordinary enlargements, but only showing their photographs as the fleeting images of the optical lantern, at the same time remarking as to the ease with which the same images can be fixed on the sensitive surface, leaving the spectators to suppose that if the exhibitor did care to make paper pictures they would have all the brilliancy and beauty of the lantern images. Moreover, the lazy and disobliging amateur who adopts this course is in a position to decline to give copies of his photographs without appearing to be ungenerous, for he can explain, "I have not even got the apparatus for making paper prints."

The greater attractions of the projection image over any kind of enduring photograph were quite understood by an enterprising commercial photographer who, in the wet collodion days, flourished in a fashionable sea-side resort; and, moreover, this gentleman well knew how to turn his knowledge to his own advantage. When a sitter whom M. D'Arcslyde judged to control a large amount of wealth had been photographed, he would take the sitter round and show him some attractive and excellent works of art—with which he knew how to make his premises attractive—and presently would lead him into a darkened apartment, where on the screen was projected at full length a picture from the negative just taken. He then would explain that the assistant who developed the plate must have been struck with the very exceptional suitability of the negative for the purposes of enlargement, and had evidently been making experiments; after which he hinted as to how sad it would be if such an exceptional chance of securing a fine enlargement were thrown away. It is said that in about two cases out of three he secured an order for a large picture; and this was in the time when enlargements were comparatively seldom seen, and realised high prices.

M. D'Arcslyde's plan of working was this: A signal was given for an extra plate to be put in the bath, and this was

arranged in a set copying camera, so that as soon as the negative was fixed and partially washed, the exposure for the transparency could be made, and generally in about five minutes afterwards the transparency was ready for the lantern.

Although photographic images projected by the optical lantern look so attractive, it is certainly not true that the lantern method of projection gives the best results when it is desired to impress the enlarged image on a sensitive surface, as unless everything is in excellent adjustment and the illuminant is small, there is an inequality of lighting which seriously mars the result. In spite of this, a large number of amateurs continue to employ a simple lantern of the Sciopticon type, and they may be expected to continue to do so on account of the numerous conveniences which this arrangement offers to the occasional worker, and especially to the worker who has but little chance of operating by daylight.

There is one thing, however, which may be remembered in connection with this subject, and this is, that when, owing to defects in the optical system, there is inequality of illumination, an improvement may be effected by interposing a piece of fine ground glass between the condenser and the transparency.

The professional photographer, on the other hand, generally prefers to make his enlargements by daylight, as he can so often find time to do this in the intervals between other occupations, and ordinarily he employs a very simple arrangement: a sheet of fine ground glass set in the wall of the dark room, a pair of adjustable grooves to hold the negative in front of this, a large movable wooden screen in the centre of which can be fixed one of the lenses used in the studio, and a kind of easel on which the sensitive paper can be stretched, often being the sum total of his arrangements.

Now that the bright weather is coming, we would urge on all to give due attention to enlarging-work, and abundant details have appeared from time to time in the PHOTOGRAPHIC NEWS. Those desirous to know rather more about the arrangements for enlarging by daylight can refer to an article on page 33 of our present volume.

Of late there has been a slight reaction in favour of large portraits taken direct, but only a very slight reaction; not enough to revive the manufacture of the enormous portrait lenses of twenty years ago. Most of the large direct portraits of the present day are taken with slow lenses, which would have been almost useless for such purposes in the wet-plate days. Indeed, one of the most suitable lenses for making a large direct portrait on a gelatino-bromide plate is a long-focus view-lens of the old type—such an instrument as one may often have at Stevens' Sale Rooms for a sovereign, or even less.



## THE CRYSTAL PALACE EXHIBITION.

THE following correspondence relating to the Awards for Lenses has been sent to us by Thomas R. Dallmeyer:—

25, Newman Street, London, March 12th, 1888.

TO THE EXECUTIVE COMMITTEE, PHOTOGRAPHIC EXHIBITION,  
CRYSTAL PALACE, S.E.

GENTLEMEN,—I should feel obliged if you would inform me, officially, what system of examination was adopted by the jury on lenses, in arriving at the result you have recently published. I ask for the following reasons:—Only one portrait lens was taken from my exhibit for examination, and this works at an intensity  $\frac{1}{3}$  greater, I believe, than that of any other maker in the Exhibition (excepting one of my own, the C series, working at  $\frac{1}{2}$ , and therefore more rapidly than any other lens made). It is not within my province, as an exhibitor, to enter into the merits of exhibits, but if comparisons of lenses be made, I wish to point out that they should be carried out on an equal basis—i.e., to judge of the superiority of one over another, they should be identical in aperture, focal length, &c. As has already been demonstrated from a discussion in one of the leading photographic journals, Voigtlander's "Euryscope" Portrait Lenses are constructed on the same lines as my "Rectilinear Portrait." Two of this type, working at  $\frac{1}{3}$ , were among my exhibits, but were not even looked at. Again, one of the chief tests of the excellence of a portrait lens is its actinism, and I am informed that no actual photographs were taken. I wish also to draw your attention to the fact that one of the chief features in my exhibit was "Optical Lantern Lenses and Condensers," and that these were also entirely overlooked. Your early reply will oblige—Yours faithfully (pro J. H. Dallmeyer),

THOS. R. DALLMEYER.

Photographic Exhibition, Crystal Palace, S.E., March 12, 1888.

J. H. DALLMEYER, Esq., 25, Newman Street, W.

DEAR SIR,—In reply to yours of this date, just to hand, you must permit me to point out that Rule XIII. was expressly provided to prevent any such correspondence respecting the judging as your letter would inevitably lead to, and the committee, having entrusted the matter to the judges, cannot go beyond their own and your rule.—Yours very truly, J. F. PEASGOOD  
(Mem. Executive Committee).

25, Newman Street, London, March 15th, 1888.

TO THE EXECUTIVE COMMITTEE, PHOTOGRAPHIC EXHIBITION,  
CRYSTAL PALACE, S.E.

GENTLEMEN,—I am obliged to you for your favour in reply to my letter of the 12th inst. Before entering as an exhibitor, I of course made myself acquainted with all your rules, and scarcely think that the terms of my enquiry can be construed into a contravention of any one of them; certainly not as an inclination for appeal against the decision of the jury. My interest and curiosity only, as an optician, have been aroused as to the means by which the judging of lenses was performed, and it occurs to me that it might be extremely instructive, and of great practical utility, were it more generally known; also, how the comparison of different lenses on unequal bases is made. If you are not already in possession of this interesting method, you will, I am sure, have no objection to obtaining it for me from the judges, who have arrived at the published results presumably by the means I have indicated. Knowing, as I do, your desire for the dissemination of photographic knowledge, I trust you will do all in your power to afford me this valuable information. Thanking you for your courtesy, and in anticipation of your reply, I am, gentlemen, yours faithfully (pro J. H. Dallmeyer),

THOS. R. DALLMEYER.

Photographic Exhibition, Crystal Palace, S.E., March 16th, 1888.

THOS. R. DALLMEYER, Esq.

DEAR SIR,—Your favour of yesterday to hand, and the committee are glad to learn from it that you have no inclination to appeal against the decision of the jury. They are quite sure that any one so well versed as yourself in business matters must fully recognize the necessity of abiding by the spirit as well as the letter of the rules, and to enter upon a discussion as desired by you would be a departure from them. Thanking you for your recognition of our desire to be useful in the dissemination of photographic knowledge,—We beg to remain, very faithfully yours,

THE EXECUTIVE COMMITTEE (per J. F. Peasgood).

## NAMING AND NUMBERING NEGATIVES.

BY C. BRANGWIN BARNES.

ON the back of most photographic mounts will be found a space for a registered number, but in nine cases out of ten that number will be conspicuous by its absence. This would seem to imply either that the negative from which the print was produced had, at the time of issue, no registered number, or that the presence of a number was unnecessary. In either case the space left would seem to be also unnecessary. I am not aware what system is in general use for naming and numbering negatives, but for the purpose of identifying the portraits of different sitters some system is absolutely necessary. In practice I find the best way of registering the names of sitters is to have a printed form filled in in the reception room and sent into the studio by the sitter, giving the name and address, together with the size and style of picture, and the number of positions required. The operator by this means is saved much unnecessary palaver, and should write the name, &c., on the edge of each plate, either with lead pencil, or scratch it through the film with a fine needle directly the plate is taken from the slide, and previous to development. The date of the month and year should also be added, as they may be of use for future reference. I do not agree with numbering the negative at the time of sitting, as if two or three positions are taken and each numbered, and the order is afterwards given from one position only, it would leave one or more numbers vacant. It is certainly unwise to register and pack away negatives which have not been approved, together with those that have, as in the event of extra orders being received there is a considerable chance of the wrong negative being printed, thus causing a considerable waste of time and material.

Again, if only one number is given to the series of positions, and a distinguishing letter added, as 219A half-length standing, 249B vignette, 249C half-length sitting, there is still a possibility—not to say probability—of all the positions being rejected, and a re-sitting being asked for. In this event it would be necessary to either search back for the old number and again use it, or give a fresh one, and thus leave the old one vacant. The plan I would propose is to number up the whole season's negatives at its close, intimating on the card mounts, or on price lists or receipt forms, that name and address only are required to accompany extra orders.

During the season I would—in point of fact I do—store the negatives after each order is printed in alphabetical order, keeping all the A's together, and so on. I place each separate negative in a paper bag or envelope, with the name and style of picture written legibly on the outside, and then stack them in their letters, so that in the event of an order for further copies being received before the negative is numbered, there is little or no trouble to find it. When the dark days of winter approach there is usually plenty of time to spare for the further work of numbering and registering, which should also be done alphabetically. A large book should be kept for this purpose, and allotted out in spaces for A's, B's, &c. The negatives should then be numbered, and the corresponding number be attached to the name and address in the book, the entries in which will read somewhat as follows:—

4110. Anderson, Miss J. ... Lowndes size ... Half-standing.  
4111. " Anderson, Mr. ... " " " Vignette.

It will be seen at a glance that a negative can thus be easily found by reference to the book. Each fifty cartes or cabinets, and each twenty-five whole-plates or 12 by 10, should then be packed together in brown paper—or preferably canvas, as it stands the wear better—and legibly numbered on the outside thus, 4,101 to 4,150, and these packets then placed in their proper order on shelves, where they can be got at easily. Once a negative has been numbered, the number can be affixed to the prints comprising an extra or repeat order, or not, at the will of the photographer.



In business, where the number of sitters is large, it is advisable that the negatives should be sent up to the finishing room together with the proof prints to avoid any mistakes in sending home, it being sometimes a difficult matter to remember who is who out of a considerable number of persons taken on the same day; while if the system of naming the negatives from the slips is in vogue, and the proofs are sent home from these names, there need be no mistake. Care should be taken in addressing photographs to go by post, as a wrongly directed packet usually takes a considerable time to find its way back to the sender, and when it does so it is usually considerably the worse for its travels, the corners being, in most cases, irretrievably ruined, and the faces of the photographs being, in many instances, covered with scratches and abrasions caused by their rubbing together. Nothing is easier than to write Kennington for Kennington, or Campden Hill for Camden Town, if attention is not kept on the work in hand; and I would suggest that the day book be always referred to for any address that is not quite so plain as it might be on the negative.

When the order comes in, the negatives should be plainly marked in the top left hand corner, in pencil or ink, with the number of copies required from each before sending into the printing room, so that in the event of a wrong number being printed, reference can easily be made; besides which, if twelve of one position, and six of another are ordered at first, and an extra order follows "from the best" or "from the one I had twelve of," the number on the corner of the negative will at once show which is the required one. This number need never be confounded with the registered number of the negative itself, which should be on the right hand top corner, and scratched through the film with a needle point. Negatives which are rejected, or from which no prints are ordered, should be put on one side for a few weeks, and then destroyed (that is to say, when another position of the same person has been ordered); but in the event of no order being received at all, as does happen in some few instances, they should be packed away marked "proofs not ordered."

## THE APPLICATION OF PHOTOGRAPHY TO MEDICINE AND ALLIED SCIENCE.

BY DR. D. G. THOMSON, M.A.\*

AMONG the many sciences which have benefited by the uses and application of photography, none, with the doubtful exception of astronomy, has profited more than the art science of medicine.

Although photography has been in use for about fifty years, it is only within the last ten that men have seen the many valuable uses the younger art-science may be put to, to aid the much more ancient art-science of medicine, this being probably due to the great advances made in our knowledge of photo-mechanical printing methods and the introduction of gelatinobromide dry plates. Without further preamble I will at once describe in what particulars photography is most useful in medical science, not necessarily in the order of their importance, but as they occur to my mind.

Firstly, in the study of anatomy, the basis of all medical study, photography renders valuable help by the accurate representations it can give of the organs of the body and their relative position to one another. Drawings vary in truthful delineation, according to the skill of the artist and his knowledge of medicine, and are further handicapped by having to be done hurriedly. Not so in photography. The modern method of freezing whole or parts of bodies, making sections through them, and photographing with orthochromatic precautions, those sections give absolutely correct views of those parts obtainable in no other way. Frezziug is resorted to as certain of the viscera are flaccid, and cannot be examined without altering their shape and position. This is notably the case in frozen sections of women dying enceinte, photographs of which illustrate modern text-books on obstetrics.

Quite recently, Dr. Arthur Thomson has been employing

photography very successfully in delineating the facial angle and contours of the skull of various races; and he has done this not merely by photographing a skull in profile of one race, and comparing it with a skull in another race, but he has ransacked museums, and with great skill and labour produced a valuable typical "composite" of very many skulls of each race, and thus arrived at much more correct and average types of the crania of the various ethnological varieties of man.

I could enlarge on the advantages anatomy has derived from photography, but must pass on to another branch of medical study—from the dry bones of anatomy to the living processes of physiology.

The functions and mechanism of the eye, from a photographic point of view, have been brought before the notice of many of you by a fellow member of the Camera Club (Dr. Lindsay Johnstone), in a learned article published in the "Club Proceedings," at the end of which he goes so far as to say: "The perception of form and colour is a vast subject, and although we are only on the threshold of the problem, yet daily facts are pouring in, and we look to the teachings of photography more than to any other science to find an answer to those two mighty problems—What is sight? What is perception of colour?"

Then, in giving us accurate drawings of the vocal cords in the larynx or voice-box, photography has rendered aid to the physiologists who investigate and describe the mechanism of that wonderful musical instrument, the human larynx. This has been done by Brown and Behnke, who photographed the images thrown on the laryngoscopic mirror produced by the various movements of the vocal cords or strings.

Similarly, the fundus, or back of the eye, has been photographed through the pupil, and reliable pictures taken of normal and abnormal conditions of the retina.

In physiology, however, the greatest practical use photography has been put to is in the study of locomotion. The various movements performed in the acts of walking, running, and leaping, both in man and in the horse, and, also, more recently, the flight of birds, have been studied by means of instantaneous photographs, taken at the rate of ten per second. Marey, in France, and Muybridge, in England, who are in the van of this method of research, obtain photo-chronographic pictures which show not only the limb of a mammal, or the wing of a bird in the various positions it assumes during flight, but also its positions in space and time. The images thus obtained he placed in the zoetrope, and in thus re-composing them got the impression of a mammal running or a bird flying.

Marey goes so far as to hope that by photo-chronography we may arrive at a true knowledge of the physical condition of flight, and that possibly then, and then only, will flying machines be constructed with some probability of success. This would, indeed, be a triumph for photography.

I would refer my hearers to a very interesting account of the photo-chronography of the flight of birds in a recent number of *Nature*, by Professor Marey, where he also states that he intends to make extended photographic studies of the flight of birds from the top of the Eiffel Tower being erected for the next Paris Exhibition.

In medicine and surgery the uses of photography consist mainly in the accurate portrayal of various diseases. In surgery photography is extensively used to illustrate deformities, injuries, and tumours in living subjects; and many hospitals have photographic appliances and dark room for the rapid and accurate pictorial delineation of those cases. I remember a dozen years ago, as a student, seeing artists drawing pictures of deformities and tumours in the wards, taking hours to do it, often to the great discomfort of the patient, and with but sorry results; now either a professional or skilled amateur gets infinitely better and more reliable results in a few seconds, to the great convenience of the patient.

In medicine, skin diseases, insanity, and the study of bacteriology are in the departments in which photography is of the greatest and most useful service. To take the first named, several atlases of skin diseases have been prepared from photographs. Those, however, have the defect of being printed from what would be called technically good negatives, whereas, as colour is all important, they would be much better if fully exposed very thin negatives were taken, printed from lightly on rough paper, and then coloured. Then in insanity, the plan of photographing patients on admission to the asylum is pursued in many institutions for the insane, not altogether as in prisons for purposes of identification in the event of escape, but as constituting the best description of the general appearance of the

\* A Communication to the Camera Club Conference.



patient, as to physiognomy and posture possible. Those photos are pasted in the case-books, and, with others taken during the course or termination of the attack of insanity, when reason has resumed its sway over the play of the features and the expression of the emotions, form most valuable accessories to the history of the case. Asylum photography, of which I have had considerable experience, having photographed over a thousand lunatics, often taxes all the patience and resources of the operator. Talk about the perpetual motion of a restless child, it is nothing to an acutely maniacal sitter. The usual resources of the professional portraitist to arrest a child's attention while the pneumatic release is being manipulated, such as the unexpected performance of a musical box, or a suddenly exhibited caged bird, would only excite such a sitter to make tracks for the photographer; and I am always ready when I see a sudden increase in the size of the image on the ground glass, to shoulder my tripod and camera, and seek the seclusion of the dark room and leave my sitter to calm himself with a little argument with the attendant.

The many dodges pursued by the prison photographers are of great use—*e.g.*, when a patient refuses to sit, to pose and pretend to photograph the attendant, whilst really doing the objector.

One patient, I remember, I could never induce to enter the studio, and I need not tell you that moral suasion is the only system in vogue now-a-days in managing the insane; so I took my camera and stand one day into the garden where he was exercising, to have a shot at him: but, of course, when all was ready he espied me, and I had just time to save my apparatus, by putting it over a hedge, when he was upon me, and was rather cross at not having succeeded in putting his foot through the camera. I may add that a few days later, on my promising to forward copies of his photo to each member of the Royal Family and House of Commons, he condescended to sit. However, even those difficulties will be completely overcome when detective cameras are perfected. Detective cameras, although still far from perfect, have been wonderfully improved of late, and will doubtless prove of much use in medical photography.

Composite photography promised at one time to be much employed in photographing the subjects of certain diseases. Mr. Francis Galton took up this subject with his usual thoroughness and skill, and attempted to obtain what he considered a type of face to be met with in those suffering from consumption. It is doubtful, however, if there is anything of real scientific value in such types. Consumption, as we know, affects people of all ages, nationalities, and bodily constitutions; and a type, if taken from a large enough number of cases, would probably be indistinguishable from the type of face in the healthy. Not so in the ethnological work on skulls, by Dr. Arthur Thomson, above-mentioned, where composite photography, in spite of the ridicule cast upon it by some writers, appears to be of real scientific value.

Now, a few words on the uses of photography in bacteriology. Most of you know that the modern theory of many fevers and epidemic diseases is that they are due to the entry into the system of bacteria—exceedingly minute organised bodies occupying a place in nature on the borderland division of plants and animals. Moreover, it is asserted certain specified bacteria or bacilli produce certain specified diseases, as for example, the tubercle bacilli, which produce only tuberculosis or consumption. The bacilli of typhoid fever, the bacilli of fowl cholera, which M. Pasteur has just sent to Australia to exterminate the rabbits. These organisms are all microscopic, are exceedingly alike, and, therefore, require to be very accurately described and delineated; micro-photography is much employed to obtain correct drawings of them. I need not remind you of the life-long work and productive labour of Dr. Maddox in micro-photography; latterly Procetta and Mr. Briginshaw have also devised and improved micro-photographic methods.

I have said nothing of the valuable aid photography has rendered to medicine, or rather its teaching, by improved photo-mechanical text-book illustration. We now see fewer illustrations in them of doubtful accuracy, and more photographic delineations of cases which always carry conviction with them. The photographs, for example, in Ross's diseases of the nervous system could not be approached in excellence by wood-cuts taken from drawings.

Then photographic process—*e.g.*, the ferro-prussiate process—could be applied to the making and copying of diagrams for teaching purposes. However, in the short space allotted to me, I have tried to indicate the different ways in which medicine is

deeply indebted to photography in recent times, and I have made it short, as any amplification would lead me into medical details not of general interest at a photographic conference. In conclusion, I would take this opportunity of publicly urging the advisability of all medical institutions being furnished with a photographic department, or at least a well-equipped dark room.

## WEIGHTS AND MEASURES AND TEN PER CENT. SOLUTIONS.

BY GEORGE LINDSAY JOHNSON.\*

THERE is, perhaps, no country in Europe where such confusion reigns supreme in the matter of standard weights and measures as in England. One of the facts which most astounded both Darwin and Wallace was that many islands exhibited fauna and flora which bore no resemblance whatever to those living and growing on the land of the neighbouring continent, but could be distinctly traced back to bygone ancestral types common to forms on the mainland; and following the same line of reasoning, I cannot help thinking, when we examine the absurd weights and measures we have to put up with, that our insular position will answer to a similar evolutionary hypothesis, and will show how and why in England, in the nineteenth century, we are groping in the obscurity of paleozoic formulae, while our continental neighbours are rejoicing under the full light of a metric system. Besides England, Russia is the only European country which still adheres to the troy weight, all others having adopted the gramme. In the United States, however, the troy weight is still used. But in England we employ four different systems—the troy, the apothecaries', the avoirdupois, and the French decimal system. Practically, however, the whole question lies between the apothecaries' and the avoirdupois weights, inasmuch as the troy weight is practically extinct, except for weighing gold and silver; and, unfortunately, the decimal system has not yet been accepted by the photographic world. I say unfortunately, because it would unquestionably be a great advantage if the French system could be used by ourselves and the Americans and Russians, for then all the world would be of one accord in this matter. Until, however, all the chemists and druggists agree to sell photographic chemicals by the gramme, and until the photographic stores agree to sell French weights and measures, we shall be more or less compelled to use the English methods. Let us first of all compare the advantages of the apothecaries' and avoirdupois weights, so that we may be able to come to some definite conclusion as to which should be used. In spite of the assertion of many of our friends that the apothecaries' weight is never used now, I need only point to some of our leading text-books on photography, to convince you of the contrary. To take one instance. At page 150 of Hleighway's "Practical Portrait Photography" (last edition), we read:—"N.B.—It is important to remember that in all English photographic formulae the solid and fluid measures of apothecaries' weights (*i.e.*, 480 grains to the ounce) are used." And in Burton's "Modern Photography," and many other text-books, the same weights are recommended.

Let us now examine the two systems. The solid measures of the apothecaries' weight are:—

20 grains = 1 scruple (ʒi) = 20 grains.  
3 scruples = 1 drachm (ʒi) = 60 grains.  
8 drachms = 1 ounce (ʒi) = 480 grains.  
12 ounces = 1 pound = 5,760 grains.

The scruple and pound are rarely used, hence the formula now becomes:—

60 grains = 1 drachm (ʒi).  
8 drachms = 1 ounce (ʒi) = 480 grains.

In avoirdupois weight the proportions are:—

27½ grains = 1 drachm.  
16 drachms = 1 ounce = 437½ grains.  
16 ounces = 1 pound = 7,000 grains.

Here it will be noticed that the drachm is less than half that of the apothecaries' in weight, but fortunately the avoirdupois drachm is rarely used. Hence the formula now becomes:—

437½ grains = 1 ounce.  
16 ounces = 1 pound = 7,000 grains.

It may be just as well to state here that the apothecaries' ounce ought always to be written ʒi, but the avoirdupois ounce, 1 oz. (and never ʒi); and also that the grain is exactly the same

\* A communication to the Camera Club Conference.



in both systems, and therefore a drachm of sixty grains is the same also. Now which of these two systems ought we to adopt?

In favour of the apothecaries' weight, I would put before you the following points:—

1. The total absence of fractions.
2. The convenient weight of the drachm of 60 grains, standing as it does between the grain and the ounce, and preventing the grains from running into the hundreds.
3. The fact that the apothecaries' ounce is in official use in the United States and Russia.
4. Most of the photographic formulæ are given in the apothecaries' weights, and that these weights are recommended in most books.
5. The scales sold at photographic stores always contain apothecaries' drachm weights.
6. The drachm is very nearly four grammes (3.83), *i.e.*, an error in excess of only  $1\frac{1}{2}$  grains, or less than three per cent.
7. In making up ten per cent. solutions it is very convenient to adopt six grains to the fl. drachm, and six times eight, or 48 grains, to the ounce of 480 grains.

In favour of the avoirdupois weights we may state:—

1. That druggists and wholesale chemists always sell drugs by avoirdupois, and never by apothecaries' weight.
2. That chemicals other than those made up in prescriptions are invariably sold by avoirdupois.
3. The solid and the fluid measured ounce (of distilled water) both weigh  $437\frac{1}{2}$  grains. This is especially convenient in weighing out fluids.
4. The pound weighs exactly 7,000 grains.
5. In many shops, especially in the country, the only weights which are kept are avoirdupois.

In comparing the rival claims of precedence, we notice that the strong point in favour of the apothecaries' weight lies in the use of the drachm. It is exactly 60 grains. It is divisible by 10, 15, 20, and 30, and by all the integers, except 7, 8, and 9, without a remainder. It represents, practically, 4 grammes. It is the eighth part of a troy ounce; and lastly, if a grain be equal to a minim—and it is nearly, being only  $\frac{3}{8}$  of a grain less—then a solid drachm will represent a fluid drachm. Now, as a rule, the weights sold at the photographic stores are square, flat weights, stamped with the gr., ℥i, and ℥i signs; and although they contain weights up to 4 drachms, or even 8 drachms, they rarely contain any weight marked with an ounce (℥i) sign on them, the half-ounce being represented by ℥iv, and not by ℥ss. Taking this into consideration, and that the Council of the British Pharmacopœia have recommended the avoirdupois weight as their standard (although the medical profession have, almost to a man, ignored their recommendation in prescribing), and considering besides the fact that chemists and druggists make up orders for chemicals by avoirdupois weight unless the order be in the form of a prescription or the symbols ℥, ℥, or ℥ be used; and lastly, taking into account how very useful a drachm weight representing 60 grains is, I venture to suggest that we should make a compromise, *viz.*, that we retain the grain and the drachm (of 60 gr.) as we find them in the boxes sold at photographic stores, and that we use them for weighing out salts; but that in writing formulæ we should express them in grains and avoirdupois ounces, (of  $437\frac{1}{2}$  grains) only; in other words, that all solids should be weighed by the avoirdupois grain, ounce, and pound only; also that the avoirdupois drachm of 27.34 grains be never mentioned, and when a drachm is mentioned it should signify 60 grains. However, some people still prefer to adhere to the apothecaries' weights. In order to prevent possible confusion, I would suggest that when apothecaries' weights are intended, the word drachm, or the signs ℥ and ℥ should be used, but when avoirdupois weights are intended, the sign oz. only be used, and never ℥ or ℥ or the word drachm. As regards the grain, there can be no mistake, as its value is always the same.

Now a few words as regards 10 per cent. solutions. This method of making up formulæ is most convenient and quite scientific. In nearly every country excepting England and America, fluids are frequently weighed like the solids, the weight of the bottle or measure being first counterbalanced by shot poured into the opposite pan. In this way it is exceedingly easy to get correct 10 per cent. solutions. Of course, with us, a grain and a minim, though nearly the same, are by no means identical, inasmuch as the volume occupied by the grain varies with its specific gravity. I think it is much more practical always to take solids by weight and liquids by measure, and as long as every one understands a 10 per cent. solution to mean 6 grains of a salt dissolved, not in a drachm of water, but in water made

up to a drachm in the measure, there can be no possible harm in its adoption. Six grains in 60 minims is not a 10 per cent. solution, strictly speaking; but if it is stated so on the label, that is all right. The more correct way, of course, would be to take 6 grains of the salt by weight, and then dissolve it in 6 by 9, *i.e.*, 54 grains by weight of distilled water. Then we have an absolute 10 per cent. solution by weight of the salt; but as Mr. Lionel Clark, in a letter to the *A.P.* last autumn, observed: "When we mix solids and liquids together we must first agree whether we mean a 10 per cent. solution by weight or by capacity. But this need not present any difficulty, for if an experimenter finds that he gets a certain result with a 10 per cent. solution on the "6 grains to the fluid drachm principle," it is clear, so long as we adopt the same method, that we must get the same strength of solution, whether the original solution be theoretically correct or not. If we agree to take  $437\frac{1}{2}$  grains to represent the ounce, then each ounce by weight of distilled water will occupy 1 oz. by measure.

I may here add a very useful remark, to be found in Squire's preface to his well-known "Companion to the British Pharmacopœia." H. S. says: "Graduated measures require testing before use, which is easily done with good weights and scales and distilled water. Every fluid ounce ought to weigh one ounce avoirdupois, but there are two lines to the liquid—one is that of capillary attraction to the sides of the vessel, the lower one the exact surface of the fluid. This should be on a line with the eye to measure accurately." Seeing, then, how easy it is to weigh out a salt in grains, and then to dissolve it in water or other fluid up to a given mark on the measure, I venture to propose that whenever we describe a ten-per-cent solution, we shall be understood to mean that each fluid-measured drachm of the solution shall contain  $5\frac{1}{2}$  grains of the salt, and that each fluid ounce by measure shall contain 44 grains,\* and that if the metric system be employed, each 10cc. of the solution by measure shall contain one gramme of the salt. And in order still further to avoid confusion, I would recommend that the word drachm be omitted when referring to solids, and that wherever ounces be mentioned, if fluid ounces, 480 minims be understood; and if solid ounces,  $437\frac{1}{2}$  grains. I am aware of the inevitable imperfections of these methods, but, at any rate, so long as we all thoroughly understand each other, no mistake of any importance can arise.

## SOME OF THE APPLICATIONS OF PHOTOGRAPHY TO SCIENTIFIC PURPOSES.

BY H. TRUMAN WOOD, M.A.†

Too many photographers are content to regard photography merely as a means of making pictures. With professionals this would be excusable, but amateurs ought to make it their first object to advance the science to which they are devoted, and to promote its application to as many diverse purposes as possible thereby increasing its usefulness.

All that I propose to do on the present occasion is to summarise quite briefly, so far as I have been able to collect them, the various scientific applications which have yet been made of photography, and to indicate the special advantages which can be obtained by its use.

First of all, photography is an absolutely unprejudiced observer; it has no personal equation. The sensitive plate records, with absolute fidelity, the image thrown upon it. We may be mistaken in our interpretation of the record, or in rendering it visible we may not treat it so as to get the plainest and best results, but that is our fault. And we can, if we like, falsify the record, but that is our dishonesty. Therefore, as a scientific witness of form, when it is available, photography is invaluable. Mr. Common's photograph of the nebula in Orion is, as a piece of scientific evidence, worth all the pictures that, with enormous care and the utmost painstaking skill, have ever been drawn of that wonderful object.

The next, and perhaps the most valuable characteristic of photography, or at least the one by which the most remarkable results have been attained, is its application to astronomy; in the power possessed by the sensitive surface of storing up feeble impressions of light, so that an image is produced by the long-continued impact of vibrations too feeble to have any effect until

\* These numbers are 5.47 and 43.75 grains exactly, but the error in taking them to be 5.5 and 44 is quite inappreciable, and may be safely neglected in any formula.

† A Communication to the Camera Club Conference.



they have been allowed to impinge upon it for a considerable time.

On the other hand, the light rays, if of sufficient energy, can, as we know, produce their due effect in a time which, to human appreciation, seems infinitely small. Thus, photography can observe and record the successive positions of a rapidly moving object; whereas, to the eye, the successive movements are, by the persistence of human vision, blended into a sort of general average, as in the case of a galloping horse; or, lost in confusion, as in that of a rapidly spinning wheel.

Then the photographic lens is, of course, indifferent as to the amount of detail which is set before it. Thus, a large extent of surface can be observed, and its details recorded at once. In a short series of exposures, the lines of a spectrum, which it would take months or years to map by hand, are recorded with an accuracy the hand could never hope for. In mapping the heavens, the exposure of a single plate may give better and more trustworthy results than six months' such toil as that to which the elder Herschel devoted years of his life. And in a few minutes there can be accumulated data which may suffice for the examination of years. Thus, the few minutes of an eclipse may provide work for months.

Probably the most important services which have been rendered by photography to science are in the domains of astronomy. Very early in the history of photography, attempts were made to photograph the moon by Professor Draper, and later on, in 1852, photographs of the moon which have hardly yet been surpassed were obtained by Mr. Warren De La Rue. For some time, photographs have been regularly taken of the sun's surface; indeed, of recent years, a photograph of the sun for every day of the year has been obtained from some part or other of the earth. The exposure for them is made by a very narrow slit, passing rapidly across the field of view. The value of photography in the short period of time available for observation during solar eclipses is well known since the eclipse of July 18, 1860. The most recent achievements, however, have been in connection with sidereal photography. This may be said to have been commenced by Dr. Gill at the Cape of Good Hope Observatory in 1882, and immediately after the publication of his results astronomers perceived the value of photography for star-charting. This work, an undertaking of enormous and lengthened toil when it has to be done by eye observation, will certainly in future always be carried out by photography alone. You are aware that Messrs. Hall and Prosper Henry have been for many years working at this important subject, and they were getting into considerable difficulties in carrying it out, when the results obtained by Dr. Gill determined them to employ photography. In 1886 it was proposed that an International Congress should be formed to carry out a survey of the heavens. The first meeting of this congress was held in April, 1887, and by its arrangements were made for charting more than twenty million stars. It is expected that the charting of stars down to the 14th magnitude will be accomplished in about five years. Ten thousand plates will be used, each exposed for a quarter of an hour; while there will also be a set of short-exposure plates to deal with the brighter stars, which will, of course, be over-exposed on the first set.

No reference to sidereal photography could be made without allusion to Mr. Common's well-known photography of the nebula in Orion, taken in 1883. Of this photograph the director of the Lick Observatory says that every important result reached by twenty-four years' study of the nebula in the great Washington equatorial were obtained by Mr. Common's photograph, which was exposed only for forty minutes; while Mr. Norman Lockyer has expressed the opinion that this photograph is one of the greatest achievements of modern astronomy; of a value greater than that of all the eye observations made during the past two-and-a-half centuries.

As regards astronomical spectroscopy, here, of course, photography has had it all its own way. Dr. Huggins was pioneer in the work of photographing star spectra in this country, and he has been followed by Dr. Henry Draper and Professor Pickering in America. By means of spectroscopic negatives, not only has much information been obtained as to the constitution of the stars, but we have also learned much about their motion. The latest published work in this direction is that by Mr. Norman Lockyer, who has applied Mr. Francis Galton's system of composite photography to the spectroscope, and has, by the combination of negatives from portions of meteoric bodies raised to incandescence, obtained spectra identical with certain stellar spectra, and has thence deduced the conclusion that the material

of the stars and of the meteoric bodies found upon the earth itself are identical.

Meteorologists have made use of photography in various ways. Its most simple application has been its employment in self-recording instruments. The mercurial column of a barometer or a thermometer has been caused to intercept the light falling on a band of sensitive paper passing behind the instrument at a known rate. A curve is thus traced which accurately represents the variations of the instrument from hour to hour. Or a ray of light is reflected by a mirror on a similar band, the mirror being caused to move by the instrument whose variations it is desired to record. Or to measure directly the amount of solar radiation, a ray of light passing through a small aperture in a closed cylindrical chamber, and falling on sensitive paper lining the inner surface of the chamber, traces, as the sun moves, a line, whose varying intensity is a measure of the variation of the solar light. Such photographic records have now for a considerable time been employed at Greenwich and at other observatories. The photographic observations of cloud forms and distances made in this country by Mr. Whipple, and in France by M. Jansen, have also, I understand, proved valuable.

Recent photographs of lightning have quite disposed of our old friend the "forked" or zig-zag flash, which will doubtless, for the future, only appear in the pictures of artists who are superior to the realities of nature, along with pink rainbows or rainbows with the red inside the arc. They also serve to show the similarity of the lightning-flash to the spark from a powerful induction machine, photographs of the two being closely alike.

If the spectroscope is ever to attain the position which has been claimed for it as an instrument for practical chemical analysis, it will certainly be by the aid of photography; and there is every reason to believe that, thanks mainly to the labours of our distinguished chairman and of Prof. Hartley, amongst others, the practical application of the spectroscope for purposes of analysis has been rendered possible. Not only can useful practical analysis of metallic substances be made by the spectroscope, but by photographing their absorption spectra, even organic substances have been caused to give useful results.

In the biological sciences the applications of photography have been many and various. I need say nothing about its services to medicine, as this subject has been specially treated by Dr. Thomson.

I will only refer to the facts that, as I believe, photography has been of service in recording the appearance caused by various diseases, and that photographs have been successfully taken of various portions of the human body—such as the retina—the interior of the throat, presenting special and great difficulties.

Anthropology finds a valuable aid in photography. Year by year one savage race after another is disappearing from the earth, or altering its ancient habits and mode of life. It is only by photography that a trustworthy record can be obtained of these vanishing types.

Whether any useful result has been, or will be obtained by means of Mr. Galton's well-known process of composite photography, I cannot say. At all events, it will be a pity if so singularly ingenious a device cannot be made to serve some useful purpose.

In the study of natural history, probably the most important work done by photography lies in the direction of photo-micrography—a branch of microscopic work which has made great progress of late, and will doubtless make more. I believe that a considerable step forward has been made—at all events as regards the higher powers—by the use of objectives of the glass lately introduced by Professor Abbe. Nor must we forget the most interesting work commenced by Mr. Muybridge, and continued by Mr. Marey, in photographing animals in motion. The researches of these two gentlemen have done more to throw light on the actual phenomena of animal movement than the investigation of all preceding naturalists put together.

The value of photography in geographical science is now so well admitted that an explorer would almost as soon think of starting without a camera as without a rifle. Consider how valuable are such photographs as those of the wonderful terraces which existed in New Zealand till two years ago. What other record have we of what travellers tell us was once the most marvellous natural phenomenon in the world? How useful, too, are such photographs as those of the Arctic expeditions, how interesting the pictures we now get after every new journey into unexplored or little-known lands!

Such are some, at all events, of the services which photography

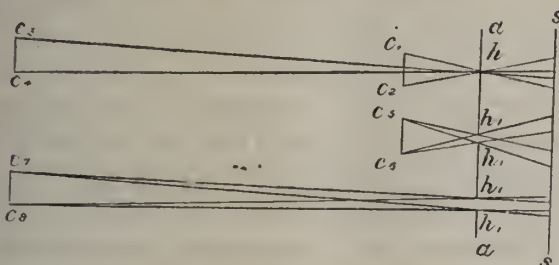


has rendered to science. I have been content to enumerate rather than to describe them. I have confined myself to scientific applications alone, leaving aside those of a technical or legal character.

# REMARKS ON MR. DONKIN'S NEW FORM OF SENSITOMETER.

BY JAMES B. SPURGE.\*

It is a great satisfaction to me to find such a good worker as Mr. Donkin taking up this very interesting subject. I am particularly struck with the extreme simplicity of his arrangement, and would like to know if I understood him correctly, that you could vary the distance of the candle from the perforated plate without influencing the result. It seems to me to be otherwise, which I hope to make clear by the aid of this diagram.



Considering two extreme cases, viz., the largest and smallest apertures: Let  $aa$  be the plane of the perforated plate,  $ss$  the sensitive film,  $c_1$  to  $c_8$  are points in the candle flame,  $h$  a hole infinitely small, and  $hh$  the boundary of the largest hole. Consider first  $h$ : the rays emitted by  $c_1$ ,  $c_2$  and  $c_3$  must cross at that point and lie within  $aa$ . The light incident upon  $ss$  will be represented by a corresponding series of points, their distance apart bearing a strict proportion to the relative position of  $aa$  between  $ss$  and the source of light,  $h$  being common in both cases.

On the other hand, take  $hh$ , when you observe these conditions are not the same, for instead of the light emitted being limited to a point upon  $ss$ , the divergent rays from  $c_3$ ,  $c_6$  and  $c_7$ ,  $c_8$  can now illuminate appreciable areas which overlap each other. These rays cross on both sides of  $aa$ . The distance apart of the crossing points will vary with every change made in the distance of the candle, the extent of such variations becoming greater for every increase in the size of the hole. I am, therefore, at a loss to understand why this does not affect the ratio of the intensities; for if the light could be removed to an infinite distance away, the areas illuminated would be found to correspond to the shape of the hole, and for different sized apertures their intensity would remain the same in every case. There are other causes of error, but time will not permit my entering into them. As an instance, the nearer the flame is brought towards the perforated plate, the greater the angular variation in the pathos of the rays, with a similar disturbance in their relative lengths from  $ss$ . There is one other matter I would like to say a few words upon, and that is the method of interpreting sensitometer results, i.e., by comparing the intensities that produce the minimum of effect. This is of importance from a scientific point of view, but it is liable to mislead the photographer who adopted it to time his exposures by, when you wish to determine the exposure needed.

To produce the best results upon different kinds of films, I have found that equal densities obtained with the sensitometer upon them respectively must be noted, and the relative intensities that produced them compared together. It will then be found that the ratios so obtained will vary with the density. Consequently, when assigning the mean value for calculating the necessary exposure in order to secure the repetition of a series of densities approximating to one another, consideration must be given to the range of the particular portion of the intensities which will be focussed upon the films, when in the camera, that you wish to obtain alike in each respective case. With reference to the employment of candles, I have found them to be very unreliable, the actinic value of the light depending greatly upon the condition of the wick.

\* Substance of Remarks at the Photographic Conference.

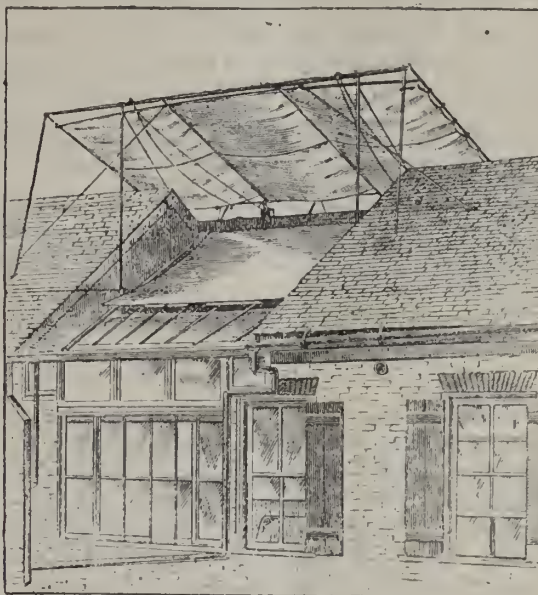
# TO MAKE IT MORE AGREEABLE UNDER THE SKYLIGHT.

BY RUDOLPH GOEBEL.

FOR at least ten years I have used a large curtain (unbleached cotton) over my whole skylight. It is a great protection from heat as well as from the cold weather. During the hot season I always keep the skylight covered thus (when I am not operating), or partly so.

The first drawing will show my plan. The ordinary curtains under the skylight make the light softer, but they alone do not

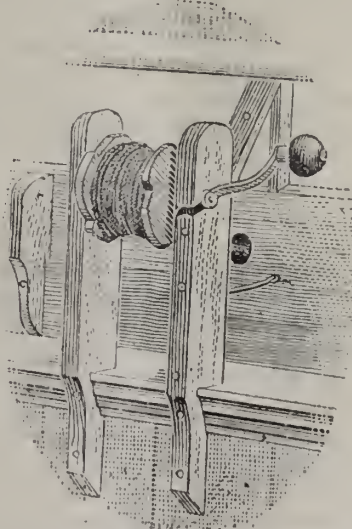
FIG. 1.



keep the heat out. About six years ago I placed an awning on the roof, and thought I could do without the big curtain; but made a mistake, and had to put up the latter again.

The construction is very plain. I place a pole, four inches in diameter, the whole length of the skylight, on one side, with

FIG. 2.



flanges at the ends for the light rope to run in, which holds a weight of about 40 pounds. This weight will hoist the curtain inside of my operating-room. On the top of the roof I have a small box to protect the curtain from bad weather. I have a small windlass, which I use to let the curtain down. The windlass (see fig. 2) has a ratchet or stops, so that I can let the cur-



tain partly down, or entirely so. During the hot season (dog days) I would rather do with one meal less a day than be without this arrangement.

The rope for pulling down the curtain runs outside, over a pulley, and enters the room on the lower sash of the side light, connecting with the windlass.

To make everything last and work easily, I have under the sash, which is at the lower end of the curtain, two wooden rollers, about three feet long, each made of hard wood. They are supplied with ordinary curtain fixtures and brackets. These rollers, when using the curtain, turn on the sash of the skylight, so the curtain will not touch the sash.

Operators who cannot use a weight, can get rollers made, with springs, of any size. They are made of wood and tin, from ten to twenty-five feet long. The canvas or cotton cover will last from two to three years.

For all galleries in southern climates this curtain arrangement will be of great benefit. The heat from the operating-room will permeate the whole building, and make life a burden if not stopped. The craft is welcome to the suggestion.

P.S.—Can any one give the fraternity a good recipe for making *good sticking paper*? I never saw as good an article as there was in the market in Daguerreotype times, thirty-five years ago.—*Philadelphia Photographer*.

### Notes.

This is how they attract the attention of photographic amateurs in Australia. In the *Melbourne Bulletin* is advertised "The Potshot Camera." It is described as "small, strong, very simple, handsomely got up, and atrociously effective both on friends and enemies." Then, possibly fearing the consequences of the word "atrociously," the advertiser goes on to say that "at the same time, an immense amount of fun can be got out of it, and photographs of people and things obtained with ease which are practically impossible by any other method."

The case of *Comber v. The Photographic Company* was mentioned last Friday in the Chancery Court before Mr. Justice Kay. The object of the motion, said Mr. Ince, who appeared for the plaintiff, was to take Mr. Comber's name off the list of shareholders on the ground of misrepresentation in the prospectus and advertisements in the newspapers. Mr. Marten having remarked that no objection was made until after application for allotment, it was arranged that the case should be taken to-day (Friday).

Has a man a copyright in his own face? This was a question raised the other night in the course of conversation at a well-known London club. An imaginary situation was put forward. Supposing a photographer going along a street with a detective camera took the photograph of a passer-by, had the latter any remedy in the event of his objecting? The arguments *pro* and *con* were about equal, and, indeed, the point seems a moot one. The difficulty is not one connected with publication of the portrait, but the taking of the portrait itself. The law gives protection against annoyance up to a certain point, but we fancy there are imperative conditions which would require a great deal of ingenuity if they are to be applied to taking a photograph. For instance, pointing a camera at a man cannot be said to be a threat, though it may put him in bodily fear—that is, supposing he takes it for an

infernal machine. Nor can it be said that it is a nuisance detrimental to health. We confess we do not see our way to a settlement of this interesting question. Yet it is very desirable it should be settled. Amateur photographers abound, and their ranks are increasing. It would be very awkward if the photographed, in the absence of any definite law on the subject, took the law into his own hands, and expressed his opinions physically on the person of the photographer.

Thomas Fletcher, whose excellent work in connection with gas burning apparatus makes every one listen with respect to what he says, definitely contradicts some statements we made last week; and yet we believe that our statement is correct, even to the minutest detail.

Mr. Fletcher's letter is as follows:—"In reply to the remarks in your last issue, the possibility of producing an *absolutely silent* blowpipe which will rapidly fuse a clean hole in any simple or compound plate of steel, iron, or copper, up to one inch or more in thickness, is not a question of opinion. Such blowpipes have been produced, and are in existence at the present moment. It is not desirable to specify more on this point. "The suppression of inventions lest evil use should be made of them" is specially desirable in this direction, for the simple and satisfactory reason that silence in such a tool is necessary only for fraudulent purposes. As regards protection by the conducting power of thick copper plates, this power is practically of no avail against such a blowpipe as I exhibited; the low fusing point of copper more than compensates for its conducting power, and I have rapidly fused openings in slabs of rolled copper five-eighths of an inch thick, this being the heaviest sample I could obtain. Further than this, the blowpipe shown in use is a toy compared with what can easily be produced; and at the present time we are making one for welding heavy boiler plates which will fuse a slot in the best drill-proof plates used for the construction of burglar-proof safes at the rate of something like eight or nine inches per minute, quick enough to make a manhole in any ordinary safe-door in five or six minutes. The assumption that the blow-pipe shown approaches the maximum power available is altogether an error. There is, in fact, hardly any limit to the power which can be obtained with ease."

Our own expression, "blowpipe to work silently," and Mr. Fletcher's "an *absolutely silent* blowpipe," obviously mean the same thing; only by using the superfluous word "absolutely" and italicising the phrase, Mr. Fletcher commits himself to the full meaning of the word silent. We hope he will give us an opportunity of witnessing a silent gas blowpipe—even though it be a small one—in action.

"Silence in such a tool is necessary only for fraudulent purposes," says Mr. Fletcher. That a reduction in the amount of noise made by a workshop tool is appreciated and paid for, is evidenced by the numerous inventions for reducing the noise made by gas engines, and by the fact that so many commercialists outrage whatever is the



modern substitute for conscience, in advertising noisy engines as silent; and the fact that users of tools will pay an additional price (*i.e.*, sacrifice other advantages) for a workshop tool which is less noisy than another, is, perhaps, the best evidence of advantage we can instance. Still, we may refer to the fact that an otherwise excellent arrangement for gas lighting stands almost condemned commercially, because each burner makes a little noise: and we ourselves had to do with an industrial operation, in which work was done by Fletcher's blowpipes, where about 20 per cent. of the expense would have been saved had the noise been so reduced as to enable the workers to converse.

Not altogether new, but well worth notice by those who make enlargements on paper, is a suggestion made by F.W. Marlow in the *Photographic Times*. Let Mr. Marlow speak for himself: "Take an old and worthless negative, with a dense deposit of silver, and cut a few lines with the point of a knife through the film down to the glass. These lines may be parallel to one another—or, better still, cross one another—at a very acute angle. They will be brilliantly illuminated on the focusing screen. The apices of the acute angles formed by the crossing lines are the best places for the observation of definition, and the attempt should be made to separate the lines forming these angles as far as possible. When focusing has been satisfactorily accomplished, the negative used for that purpose should be replaced by the one from which the print is to be made, care being taken that the face of the latter occupies precisely the same position as that of the former."

A correspondent writes:—"Would it not be a boon to some of the members of the Photographic Society if the black board and chalk were removed from the room, never to be seen again. The board has always been a source of trouble, and from the way it 'wobbles,' I fully expect some Tuesday evening to see it collapse just as somebody is elucidating an equation. But this collapse would be a small matter. What many of the members object to is the equation itself. Quite right, of course, that there should be such things, and quite right to put them in the paper; but mathematicians ought to spare their audience the infliction which is caused by seeing problems worked out on the black board. To some persons the black board and chalk are irresistible attractions, and they fly to them on the least provocation. Calculations are very necessary and interesting things, no doubt, but they have the drawback of inviting other calculations, as they did the other night. The members of the Photographic Society are not all mathematicians, and the majority take but a languid interest in  $x$  and  $y$ , minus and plus."

"It is well known," writes a correspondent, "that a fresh set of books is prepared by the Bank of England each quarter for the payment of the dividends on the Government Stocks which may then be due to investors. But it is not so generally known," he adds, "that in the preparation of these new set of books a photographic pro-

cess is employed in the reproduction of the pages containing the names of the investors and their autograph signature."

Seeing, then, that the "Old Lady of Threadneedle Street" thus turns photography to account in order to expedite official work, we do not see why photography should not be recognized in City offices generally. It will take time, no doubt, for the camera to be set up in place of the copying press, and the posting of books by photography is not a process likely to be realized just yet; but we have often wondered that the circulation of photographic samples of the goods they have to sell is not more freely carried out by large City firms. The "drummer"—to use the American name for the commercial traveller—and that curious vehicle, a kind of cross between a dog-cart and a piano-van, in which he carries his samples, could surely be often replaced by a series of photographs without any detriment to the business; or, at the very least, catalogues illustrated by photographs could be advantageously used more widely.

### THE MAGNESIUM LIGHT.

BY J. HUBERT.\*

"WILL magnesium powder, like gelatine, mark an epoch in the history of photography, or will it only prove an interesting pastime for the amateur and a makeshift for the professional?" are questions which at the present time occupy the minds of many who would not deign to give it a thought were it not for the fact that it has a promising future.

The idea once placed before the public in a tangible form by clever men is so simple that every lover of photography eagerly seizes it, and many are the articles written about it. From this it may be concluded that it is not an easy task to say anything on the matter without running a risk of wounding the susceptibilities of somebody. The scientist who introduced the chlorate of potash mixture is attacked by the one who sees danger in it, the champion of gun-cotton finds a rival in the blowpipe, and he in his turn is criticised by those who find that his efforts result in waste by incomplete combustion of the powder.

I should be the last to offer any interference for the sake of mere talk, but I cannot fail to recognise the importance of the subject, and for that reason I do not think it needs much apology to pass a few remarks thereon. It seems to me improbable that it will eventually supersede daylight portraiture, and it is somewhat doubtful whether it will ever inflict serious injury to it; but it behoves photographers to be on the look-out and be prepared for whatever may turn up. I have myself lately produced photographs, and seen them done by others, which could not be distinguished from daylight work even by an expert. "What man hath done, man can do," and this truism is significant enough to stimulate our efforts.

Societies like ours, composed of the *élite* of workers in the field of photographic science, are just the bodies which have it in their power to extract the utmost out of any process, and I hope that many will set to the work of investigation, for the little I can do in the matter cannot be of greater relative value than the poker has to the fire, and though this may prove small ambition on my part, I will be content if it becomes the means of stirring greater enthusiasm. To come to the point, it appears to me that an easy analysis may be made by dividing the matter into four different heads:—1. What is the most suitable form of combustion? 2. The prevention of smoke. 3. Simultaneous firing of several lamps. 4. How many lamps should be employed?

Much has been said about it being immaterial whether a long or short exposure be given, but I think it needs no great penetration to find that the very value of the whole process lies in the marvellous instantaneous actinic power of the light, for, apart from the fact that the contrasts of the elimination be-

\* Communication to the London and Provincial Photographic Association.



tween focussing and the actual exposure render it impossible to prevent contraction of the eyelids, it is for many more reasons highly desirable that the negative should be taken before the sitter becomes aware of it. One of these is the abandonment of that instrument of torture, the headrest; another, the facility of taking invalids at their homes, &c.

Taking for granted that we must have a substance that will yield instantaneous pictures, the first question arises, What is this substance? The method of blowing the powder through a flame creates great waste, and even if that were avoidable, the necessary pressure can scarcely be of an instantaneous nature.

Guncotton spread and covered with the powder must not be despised, and can be made to answer our purpose well, but the application is troublesome, for, apart from having to carefully prepare a suitable guncotton bed for the powder, it is not very easy to obtain it of the proper temperature, which has yet to be ascertained by experiment. Waste will also ensue if sufficient guncotton is not used, or if the powder is heaped up, or the guncotton not sufficiently spread. The chlorate of potash and antimony, or prussiate of potash mixture, fulfils to my mind the requirements better than any other known substance, for the ready yield of oxygen enhances the brilliancy of the light considerably; and, secondly, it is capable of instant combustion if care is taken to procure it at a proper place.

The only thing that can and has been urged against it is the danger of premature explosion and the noxious fumes of the chloride of antimony. The former may, however, be avoided by mixing the required proportion immediately before use. The latter will entirely be obviated by the simple device of trapping the smoke, which I have the pleasure to bring practically before your notice to-night, and which will, I trust, deal successfully with the second question, the smoke nuisance, which is intolerable, even if the fumes were not poisonous. It prevents the immediate repetition of an operation, and has the general effect of driving every one who cares for his constitution from the vicinity. In my opinion the process will never rise in public favour until that has been accomplished, and I think it should form the first consideration in constructing an artificial-light apparatus where smoke is an accompaniment. The apparatus can be supplied at 12s. 6d., and can, of course, be modified as regards the necessary angle of reflection.

The third question is very important, namely, the simultaneous firing of any number of lamps employed. I firmly believe that I have succeeded in solving that problem by another simple arrangement. As you will presently see, it consists of india-rubber gas pipes with intersecting brass tubes (one for each lamp), out of which another tube of very fine calibre protrudes, and leads into the lamp. One end of the tubing is attached to the gas, and a small flame sustained, in front of which the explosive is placed. Upon turning the gas tap fully on, any number of lamps will be ignited at precisely the same moment without necessitating electricity, which proves troublesome and cumbersome, especially when travelling, besides being somewhat expensive. The other end of the gas pipe can be attached to a burner to focus by. Of course, where no gas is installed, the hydrogen cylinders for the optical lantern may be used. If a chimney is introduced, it is also a very simple matter to substitute a gas burner for the finely calibrated brass tube affixed for firing the illuminant and focus thereby. But, then, a cup must be put over the chimney after. It is highly desirable—in fact necessary—that a very bright light be kept burning during the whole time of the operation. When long-focus lenses are used, focussing presents some difficulties, and it will be a useful plan to place a candle with a card-board reflector, which serves also to shield the light from the lens, into the sitter's hands, directing him to move it up or down according to the part to be focussed.

The last question can only be answered by each operator in accordance with individual skill. No rule can very well be laid down. Much may be accomplished with one lamp and the judicious use of reflectors, but I think not less than two lamps should be employed, not far enough apart as to create a second high-light in the pupil of the eye; but, when groups are aimed at, more lamps are wanted. The construction of my lamp prevents direct rays of light entering the lens.

#### A SUMMER TRIP TO BELGIUM.

BY ISMAIL SABRY.\*

I LEFT Derby at 3.20 a.m., on Friday, September 2nd, 1887, and

\* A Communication to the Derby Photographic Association.

caught the up Scotchman at Trent at 4.45 a.m., reaching St. Pancras at 7.30 a.m., and after breakfasting, went across London to Charing Cross station, and left there by the 9.45 a.m. South Eastern Express Boat Train, which only carries first and second class passengers. (Since I have been in this country I have noticed that on some railways, in express trains, only first and second class passengers are carried; but thanks to the Midland Railway Company for being the first to carry third class passengers by all trains, and in winter time to supply foot warmers, and who are now trying experiments to heat the carriages by exhaust steam from the engine.) Before starting from there, I noticed the porters rolling up some red cloth, and upon enquiry, learned it had been laid for the Crown Prince of Germany, who was to have gone home that day; but I heard a few days afterwards that they had telegraphed from Dover to say the sea was very rough, and he had better not cross.

At Folkestone, where I first saw the sea, the reason for the telegram to the Prince was quite apparent, although I was assured that outside it was as calm as a mill-pond. When I got to Dover station the porter said, "All change here," and on being asked why, replied, "The sea is so rough the steamer will not be able to start from the pier, but from the harbour." So after a very windy walk to the latter place, I got on the steamer "Prince Bawdoun," and we left Dover at 12.7 p.m. Greenwich time, arriving at Ostend at 4.27 p.m. Brussels time; just a 4 hours' passage, 3½ hours of which was very rough, there being three and sometimes four men at the wheel all the time. After passing the Custom-house—which, in my case, was a very difficult matter as the official could not make out what the dry plates were for, and as I could not explain to him in French, he began to go to the bottom of everything until a lady friend, seeing my predicament, came to the rescue and explained it all to him, when he said, "All right, pass on." I walked on to the station of the Steam Tramway Co. (Chemin de Fer Vicinal); the gauge is about 4 ft. wide, and a single line, except at the stations. Each train has two guards, one for the first and second class carriages, and the other for the third. One of the notices in the carriages says, "It is forbidden to mount into the carriages or to get down from them during the march of the train." The train takes about an hour to run the distance (12 miles) from Ostend to Blankenberghe, which is considered to be the Brighton of Belgium. The bathing machines are well fitted up, and the ladies and gentlemen bathe together. The Digue or Promenade is over a mile long, and has many notices boards put up in English, French, German, and Flemish. The English I give herewith:—"Bathers are expressly recommended to hold themselves at least 15 yards from the breakers by buoys designed."

It is usual to breakfast out of doors in front of the hotels and houses.

On Friday, September 9, I went to Bruges, and took some photos of the most interesting places. The Belfry, which has been immortalized by Longfellow, is two hundred and ninety feet high. The chimes are the finest in Europe, and are played four times an hour by machinery, and three times a week by a musician. On Saturday, September 10th, I went to Lessines, a few miles out, to expose a plate on the Church, which is considered to be the finest Gothic Church in North Flanders; but I did not think it worth while, and on my way back I met a Flemish man riding in a small cart, loaded with fish and drawn by two dogs. I asked him if he would allow me to take a photo of him and the dogs, which he very gladly agreed to. The country is very flat; in fact, there is nothing worth taking in the shape of scenery. When any photos are taken, you may always be sure of a goodly surrounding of people of all sorts and conditions. When taking the Belfry at Bruges, I was a very long time before I could get the people to stand still, or to keep away from the front of the camera. My advice is, that anyone who intends going abroad with his camera should be prepared with every requisite before starting, and the work must be instantaneous, especially if it is in or near a town.

On September 12th I went to Bruges to see the Chapel of the Holy Blood, which is so called by reason of a few drops of the blood of our Saviour having been brought from the Holy Land, and presented by Count Thierry of Alsace. This blood is kept in a casket made of gold and silver, studded with precious stones, which was given by Mary Queen of Scots, and the value of it is £10,000. The admission is 6d. each, but on Fridays, from 6 till 11.30 a.m., it is exhibited free, and it is said it used to liquefy every Good Friday. I noticed on coming home that the ticket examiner looked at the tickets between the stations whilst the train was in motion, he walking on the footboards, from one



carriage to another. I may here add, in conclusion, that although I spent a thoroughly enjoyable holiday abroad, I felt a pleasure in returning to England again, for though it is not the land of my birth, yet I am thankful that it has been my lot to be thrown among Englishmen.

## MODERN PHOTOGRAPHIC ENGRAVING AND PRINTING.

BY GEORGE S. WATERLOW.\*

THE subject of the modern application of photography to the art of engraving and printing is one of stupendous interest to all communities, of immense value to future generations, and teems with interesting details. I cannot but feel that within the compass of this paper it is not possible or desirable that I should attempt any historical account of the various researches and experiments, which at the present time place us in possession of the means of illustrating by practical and easy methods every subject of art, life, and nature—methods but vaguely dreamed of a generation ago, even by the most sanguine enthusiasts. Neither should I endeavour to criticise the merits of specific processes or the busy researches themselves, but I simply describe as concisely as possible some of the means by which to-day we may produce illustrations of every description through the powerful agency of the camera.

Firstly, I will take the names of some of the various methods, and then describe the practical working of each as plainly as I can, avoiding the use of technical terms.

Modern photographic engraving and printing may be divided into four heads:—

1. *Typographic blocks*, which are etched in relief, and printed from the surface in an ordinary printing-press.
2. *Plates*, which are etched in intaglio, and printed from the depth, as in the case of an engraved copper-plate.
3. *Woodbury blocks*, which are impressed with an intaglio image by a gelatine relief under great pressure, and printed from by a special press.
4. *Collotype or Albertype plates*—i.e., a surface of gelatine on glass or metal, which has been sensitised, acted upon by light through a negative, and is printed from in a hand or steam-printing press.

The most important of the many photographic methods now before the world for mechanically producing prints on paper in the printing-press is that which is popularly named photo-zincography, and is the first referred to on my list.

Before proceeding to a description of the working of this useful process, I might explain, for the benefit of the tyro, that nearly all the results obtained by these processes are founded on the simple fact that gelatine in the presence of salts of chromium is rendered insoluble in exact proportion to the amount of light allowed to fall upon its surface. In this peculiar property of the organic substances previously soluble in water, as in the case of gelatine, lies the whole secret of nearly every photo-mechanical process, and in its various modifications lie the initiatory stages of all the different categories just mentioned.

I will briefly explain this action. Suppose I dissolve ten grains of gelatine in an ounce of water, and add ten grains of bichromate of potash ( $K_2Cr_2O_7$ ), then coat a sheet of smooth writing-paper with the mixture and dry it in the dark. On now exposing this piece of prepared paper under a negative of a drawing in lines for, say, ten minutes in sunlight, I obtain a faint image or print of the drawing in insoluble gelatine, because wherever the light has penetrated the clear parts or lines of the negative it has, through the addition of the bichromate of potash, so oxidised and changed the nature of the gelatine that it cannot again be dissolved even in hot water. But there is yet another valuable property to be mentioned in connection with this oxidised gelatine, and that is its capability of taking printing ink. Suppose I take this exposed piece of gelatinised paper, thus acted on by light as mentioned, and soak it for a few minutes in cold water, then roughly drying it with blotting-paper, lay it on a flat board, and, taking a roller charged with printers' ink, pass it gently over two or three times, I shall find that the exposed lines will greedily take ink from the roller, whilst the unexposed or white parts will refuse the slightest particle. I shall now have a facsimile copy of the lines of my negative in printers' ink on the gelatinised piece of paper, and if the ink I used were what is known as transfer ink, the inked piece of paper would be a photo-litho transfer, and ready

as soon as dry for laying down upon a lithographic stone for printing from in the ordinary way, or, if desired, a plate of zinc might be substituted for the lithographic stone, and by passing the zinc plate through a press in contact with the transfer, the greasy ink would leave the gelatine and attach itself to the zinc, giving a plate ready for the photo-zinc etcher to make it into a typographic block.

Having thus roughly sketched the general principle of the foundation of nearly all photo-mechanical printing, I will briefly discuss the processes referred to, and endeavour to describe the working.

As I remarked, the most important process, owing to its simplicity and cheapness, is that of photo-zinc etched blocks for ordinary typographic printing. I can, of course, only simply state the generally employed method of producing these blocks, and slightly touch upon the other subjects within the limits of this paper. For exact formula and details for successfully working any one of these processes, I must refer you to specialists who make these arts a life study, and to the few works at present published on the subjects.

First, then, the operations of etching a type block, say from a line drawing.

The drawing intended for reproduction is pinned on a board and placed squarely before a copying-camera in a good even light. The lens used for this purpose must be capable of giving a perfectly sharp picture right up to the edges, and must be of the class called rectilinear, i.e., giving straight lines. The picture is then accurately focussed and brought to the required size; a plate is prepared in the dark room by the collodion process, which is then exposed in the camera for the proper time and developed in the ordinary way; after development, the plate is fixed and strongly intensified in order to render the white portions of the drawings as opaque as possible. On looking through a properly treated negative of this kind, it will be seen that the parts representing the lines and black portions of the drawing are clear glass, the whites representing the paper a dense black. The negative after drying is ready for the next operation; i.e., printing upon zinc. This is done in several ways. One method will, however, be sufficient for the purpose here. I obtain a piece of the bichromatised gelatine paper previously mentioned, and place it on the face of the negative in a printing-frame. This is exposed to sunlight (if there is any) or daylight, for a period varying from five to thirty minutes, according to the strength of the light. This exposed piece of paper is then covered all over with a thin coating of printing ink, and wetted in a bath of cold water. In a few minutes the ink leaves the white or protected parts of the paper, remaining only on the lines where the light has passed through the negative and affected the gelatine.

(To be continued.)

## Patent Intelligence.

### Applications for Letters Patent.

- 3,620. JOHN BOLTON ROBINSON, 172, Regent Street, London, W., for "An improved view finder and view meter combined for photographic purposes."—March 9, 1888.
- 3,658. JOHN WATSON, 186, Fleet Street, London, E.C., for "Improvements in producing coloured photographs."—March 9th, 1888.
- 3,721. CARL NORMAN, Graphic Villa, St. James' Road, Tunbridge Wells, Kent, for "A combined strut and suspender for supporting or suspending framed pictures, looking-glasses, and other like articles."—March 10th, 1888.
- 3,779. JOSEPH LONDON BERRY, 43, Cardiff Street, Aberdare, for "A 'camera guu' for using with any description of camera for instantaneous photographs."—March 12, 1888.
- 3,782. FREDERICK TAYLOR, 4, Corporation Street, Manchester, for "Improvements in stands or tables for holding photographic cameras, also applicable for holding music, newspapers, or similar objects."—March 12, 1888.
- 4,024. EDMUND JOHN PASSINGHAM, 65 and 66, Chancery Lane, London, for "Improvements in mounting photographs and objects."—March 15, 1888.

Patent on which the Fourth Year's Renewal Fee has been Paid.

- 4,906 of 1884. A. F. HOWMAN.—Dark slide for photographic cameras.

\* A Communication to the Camera Club Conference.





## Correspondence.

## DIFFUSION OF FOCUS.

DEAR SIR,—As I was unable to be present at the Photographic Society when Mr. Dallmeyer read his paper on "Diffusion of Focus," I shall be glad if you will allow me to make a few remarks upon this much debated subject.

I am not aware that any one has ever denied the desirability of getting a more even definition in large portrait studies than the fully corrected best lenses constructed for such work will give, and accordingly we find that various movements have been made during the exposure to endeavour to secure this end. The model has been moved, the sensitive plate has been moved, the lens, and I believe also a component of the lens has been moved, in each case, doubtless, with more or less success. An apparatus was constructed by Claudet and approved by Voigtlander, in which the separation of the components of the lens was so varied during exposure as to cause the focal plane of the lens to pass through the required space without altering the size of the picture.

But the only attempt to secure this desideratum, that can lay any claim to popularity, is the diffusion of focus arrangement patented by J. H. Dallmeyer, in which a certain and reproduceable amount of positive spherical aberration is brought about before the exposure begins, by altering the distance between the elements of the back component of his portrait combination. As it has been proved possible to discuss the theory of this matter without getting nearer the main question (which I conceive to be—Is a little spherical aberration ever or generally desirable, particularly in large direct portrait work?) it will be instructive to quote a few opinions on this point.

In Paul Pretsch's abridged translation of a paper by J. Petzval concerning depth of focus, we read: "Therefore a lens in possession of a considerable spherical aberration reproduces the picture not in a curved surface—like another compound lens free of any aberration—but filling a certain space. . . . Therefore, there are all the requisites of an ideal perfectness, only the sharpness is wanted."

Mr. Mayall has said that "he believed that the only correct principle was that which Mr. Dallmeyer had . . . succeeded in embodying in a lens, with such distributed definition that all necessary parts would practically be in focus."

Lake Price has written that it is in photographs approaching life-size "that the new portrait lens of Dallmeyer shows its superior capabilities and becomes most valuable to the photographer, giving a general fleshy softness to the features in lieu of the metallic hard appearance, and by increasing the depth of perfect focus."

Dr. Vogel writes: "M. Grasshoff, the well-known artist-photographer, has recently tried the new patent lens for portraits from Dallmeyer, and with very remarkable success. . . . M. Grasshoff showed a very nice picture, 7 by 9, made with the new lens, 2½ inches diameter, which was much admired. I repeated his trials, and confirm his result. The work of the lens was excellent."

Professor Towler says: "From Dallmeyer we derive the diffusion lenses for portraiture, which are impressed with originality, and are unsurpassed."

If we add to these authorities, T. R. Williams, Valentine Blanchard, and Jabez Hughes, even excluding J. H. Dallmeyer as an interested party, we have very sufficient evidence that there is something of usefulness in the principle under discussion, though we are not bound to accept the views expressed in their literal fulness. If, therefore, theory should lead to the conclusion that nothing was gained and that something was lost by introducing a little spherical aberration under certain circumstances, it would be well to amend the theory. And as some photographers condemn the principle, presumably not without experience, we must conclude either that they personally do not admire

what others delight in, or else that they have not been called upon to produce that sort of work in which a certain small amount of spherical aberration is an advantage.

The fact that the name and instruments of Dallmeyer are mixed up in this matter is a mere accident of circumstance; the question is not one of this or that maker's apparatus, but of the possible advantage of a little spherical aberration. And this question, I believe, can only be answered in one way, even by those who personally find "diffusion of focus" to be an unmitigated evil, if the principle is looked at from a judicial standpoint.—I am, yours faithfully,

CHAPMAN JONES.

## MATT-SURFACE SILVER PAPERS.

SIR,—I have no wish to advertise a dealer's goods through a letter to your valuable weekly, but I am using a matt-surface paper which I very much like, and will gladly give particulars of it to any amateur who will write to me for them. In saying this, I am assuming professionals know all about these things. I will, however, add that I am always glad when any of their order write to me on any subject relating to photography.

Melton Mowbray.

WILLIAM ADCOCK.

## THE NEW ASSOCIATION.

SIR,—It is announced "The Amateur Photographers' Charitable Association" will, a fortnight hence, be *un fait accompli*. In this case the expected has happened: the President will be the nobleman who projected it; the Hon. Secretary, a gentleman who lately addressed you in these columns.

I regret this in a degree I cannot express. I foresee in it the ruin of many families, the engendering of much ill-will. It is natural that men whose vital interests are stabbed, should resent the blow. It is unnatural that traders shall see hundreds of so-called amateurs enroll themselves to do the work they now perform without a murmur and without alarm. It is idle to say it is not interference; it is nonsense to say it will do no harm.

It is, I believe, fair to say, that to-day there is in England one so-called amateur to every thousand of the population; and these are daily increasing. It is even predicted that in less than ten years photography will be taught in every decent school. As a rule, the amateur comes from the classes who have been the best customers of the professional. Each of these has his or her circle of friends, and embrace, on the whole, a large set. The consequences are easily foreseen. "Oh, Mr. Smith, will you have your portrait taken? The money will go to the Broken-down Plasterers' Anti-Gypsum Home at Epsom." "How nice of you, Miss Laura! I must, I really must, give you a sitting." And for this, Mr. Smith pays willingly and handsomely; but having done so, he decides upon giving the item photography absence from his cash-book for some time to come. Mr. Smith, however, shows the portrait to his friend Brown, who, though not caring for Laura Denis, cares so much for her cousin Mary, that he, too, in hope of being talked about in that quarter, will solicit that he may aid the *Charity*, and this Mr. Smith negotiates for him.

Mr. Fulcrum is a well-known amateur. He is good-looking, has a blonde moustache, and gentle manners. Of course he is a favourite with ladies, and of these, at least one is learning retouching, that she may assist him with his negatives. How interesting! He has quite a photographic *clientele*. The moustache and the nose above it make Mrs. Gubbins a purchaser of his "Views in Grasmere and Dovedale." His hint at a portrait secures an effigy of Mrs. Gubbins, and two guineas for "The Young Girls' Defence-when-in-Difficulty Association."

I tell you, sir, the thing will float, and with those who dearly love a lord, will be popular; but as the money arising from it will be so much out of the pockets of those whose business it should be to earn it, I hope and believe it will be



spurned by the thinking and considerate amongst amateurs who obey the maxim "Do as you would be done by."

As an amateur of thirty years' standing, I should be glad to see some combination amongst my fellows to resist the effects of this good intent of ill-omen business. If it takes the form of help to the Photographers' Benevolent Association it will render assistance where, before long, it will be much needed.

Melton Mowbray.

WILLIAM ADCOCK.

#### MAKING THE DIAPHRAGM LIGHT-TIGHT.

SIR,—We shall be obliged if you will publish the following reply to your article on "Making the Diaphragm Slot Light-tight."

Many readers have inferred from your expressions that the edges of the slot in question were rough and jagged; whereas they are perfectly smooth and clean. We suppose you intended merely to say that the slot varied in width a few thousandths of an inch. We have measured it with a micrometer gauge, and do not find a variation of two-thousandths.

Your criticism is based on an erroneous supposition. The slot in the tube is purposely made wider than the stop, to prevent the brightening of the stop's blackened surface, which occurs when it fits its metal seating so tightly as you appear to think it should.

What we have thought particularly objectionable is that those of your readers who do not know our work, would think it to be other than of first-class quality and finish.—Yours faithfully,

T. S. and W. TAYLOR.

State Street, Leicester, March 20th.

[We intended to say exactly what we did say, and if the edges of the slot had been jagged we should have said so. During the week Messrs. Taylor have shown us a considerable number of their lenses, and we have come to the conclusion that the great variation in the width of the slot in the article sent for review was purely accidental, and resulted from a slip of the tool. Messrs. Taylor invited us to select for trial any lens in their stock, and we selected one belonging to a customer, and which lens had, as we understood, been returned for some additional adaptors to be made. On trial, the instrument, in which the diaphragms were fitted without cloth, proved to be excellent from an optical point of view, the mechanical fitting being also good.]

#### AN EASY PRINTING PROCESS.

DEAR SIR,—A good many amateurs have taken up the carbon process, but I am surprised that more have not done so, and can only account for it by supposing that they fancy there is some special difficulty in the operations. I admit that if you have to print by double transfer, there is some difficulty and a little uncertainty, but with the single transfer process I can conceive nothing more easy.

Here are the operations in a nutshell. You buy your tissue ready sensitized, place it upon the negative in an ordinary printing frame, time the exposure in the most simple manner with the actinometer, take the exposed tissue from the frames and place in cold water with pieces of single transfer paper, lift them out and force together with a squeegee, place between blotting boards for a few minutes, until, say, half-a-dozen pictures have been thus treated; then, beginning with the first, simply develop them in warm water; when done, a rinse in cold water stops the further action; a few minutes in a solution of alum, and a final rinse in cold water, complete the operations. Nothing can be much more easy and simple than this. I always buy my tissue sensitive, and cut to the sizes I want to use. I have had it in several colours. It comes cheaply per post, and I have found it in good condition for days after I have received it.

But this simple and easy process does not suit negatives taken in the ordinary manner, as it inverts the image, making the left hand appear right, and *vice versa*; however, it happens that with the employment of dry plates, we have a ready means of overcoming that difficulty by

simply putting the plates in the slides with the glass side towards the lens instead of the coated side. The effect of this will be to give landscapes better definition in the foreground, which is generally an improvement. But if this is not desired, turning the focussing glass of the camera so that its ground side is furthest from the lens will give you the focus as before. The minute difference there may happen to be between the thickness of your focussing glass and that of the average dry plate will be quite inappreciable. Of course your dry plates should be on decent glass free from specks and flaws, but, practically, I have had no trouble on this score, and have used many makes of plates. I do find, though, that the glasses are smeared with emulsion, and so, before putting the plates in the slides, I lay them face downwards upon a piece of black velvet and go over the glass sides with a moist sponge and soft cloth; this is easily done, and only takes a minute or two.

In putting the plates into the dark backs, you simply put the coated side uppermost, then lay over it a piece of blackened card or black cloth to prevent injury to the film from the springs of the inner diaphragm, fasten up the back, and the plates will now give you reversed negatives suitable for single transfer carbon, or any of the mechanical printing processes.

The exposure and development of such plates are absolutely the same as for plates used in the ordinary manner; no difference can be detected in either of these manipulations or in the finished negative; in this way prints of absolute permanency can be produced in various colorings, and with a variety of effects that raises photography somewhat nearer the dignity of fine art.

With your permission I will next week give you a brief description of a simple method of stripping negatives taken in the usual manner so as to make them suitable for printing in either carbon or silver. H. J. BURTON.

Ealing Dene, W.

#### DALLMEYER'S NEW LENS.

SIR,—As the reports on the discussion following Mr. Traill Taylor's paper on "Single Lenses Corrected for Architecture" might leave many still to infer that the instrument I have recently introduced is only a revival of quite an old lens constructed by the late Mr. James Goddard, for the interest of your readers, and in justice to myself, I am desirous of pointing out the important differences of optical construction that really exist; for it can hardly be expected that those who, unlike Mr. Traill Taylor, have not made a special study of optics in all its bearings, and have only a general acquaintance with exterior forms of lenses, were able, from the cursory discussion, to grasp and appreciate the real optical differences.

I was diffident at the Conference of dwelling too much upon the personal matter referred to by Mr. Taylor in his paper, as I fully recognised the general bearing of his remarks, viz., to aid the photographer not in possession of a rectilinear lens to convert the ordinary forms of landscape distorting lenses into a rectilinear combination as a "makeshift," though unattended with any certain degree of optical correction. However, what I did say and describe on the black-board on that occasion was evidently imperfectly understood.

In the course of my work to produce a single non-distorting combination, I actually, though by an independent coincidence, constructed a lens of the form made by Mr. Goddard, described in the *British Journal of Photography* for 1869. I discarded the form, fig. 1 Goddard, as useless, for three reasons, viz. :—

1. The permissible aperture free from spherical aberration was very small compared to that in the form eventually adopted.

2. The field was too curved to be of any use; so much so, that at three inches from the axis, the *versine* was nearly one inch, and slight distortion at the margins became apparent.



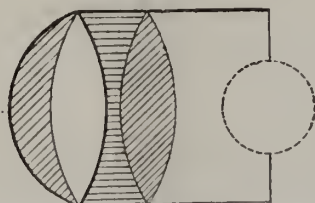
3. Under the particular conditions indicated, to cure the first defect by making the curves of the back lens shallower, the field naturally became much more curved.

Goddard evidently made the posterior lens of his combination of very deep curves to obtain flatter field, and I referred to this as liable to increase the probability of the flare spot. Mr. Traill Taylor was evidently acquainted with this, for he describes the lens of Goddard in 1869 as follows:—

"The double periscopic lens of Goddard described in the paper we have extracted above from the manuscripts now in our possession, is a singular looking lens at first sight. When we first got ours, we were rather surprised at its external shape, which was that of a double convex lens of exceeding thickness."

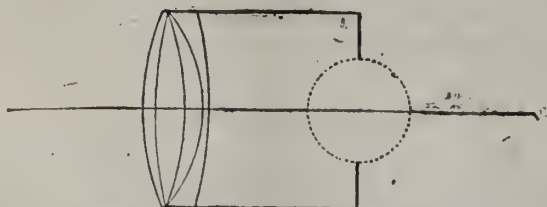
The author of the paper states that the corrector or double anterior combination in both instances (see figs. 1

Fig. 1.

Goddard's Periscopic Lens (*British Journal of Photography*, 1869, p. 398).

and 2) are of practically "plain" glass in both; but here the similarity as to optical construction ceases. One can

Fig. 2.



Dallmeyer's New Rectilinear Landscape Lens, 1888.

see through plain glass and a number of other transparent substances, but that does not prove that they possess the same optical properties.

In the lens fig. 2, by the employment of the "Gauss" form of front as a corrector, and by selecting suitable curvatures for the lenses, I have produced an instrument entirely free from distortion, without astigmatism, and one that gives a very flat field. Moreover, the curvatures generally are shallow compared with the lens of Goddard, which is evinced from the fact of the combination in its own cell being thin. Air space included, it is nearly as thin in the centre as a triple cemented meniscus combination.—I am, sir, yours obediently, THOS. R. DALLMEYER.

25, Newman Street, London, W., March 21st.

## Proceedings of Societies.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The usual weekly meeting was held on the 15th inst.; Mr. E. CLIFTON occupied the chair.

L. MEDLAND stated that he had overcome the difficulty previously experienced in manipulating Decoudin's photometer. Two bands of rather wide elastic are stretched across the screen of the camera; the bands are held in position by a hook attached to each end of the elastics, which catch in any part of the woodwork of the sides of the camera. The photometer is held between the two bands, and can be easily slid backwards and forwards across the screen of the camera.

A negative showing innumerable black spots by transmitted light was passed round by D. ATKINSON.

The CHAIRMAN said he had experienced a similar case; he concluded that the plate showing this defect had been coated with an unfiltered emulsion.

A. HADDON thought a weak solution of hydrochloric acid would be useful in clearing the plate. Spots might be caused by rust in the water used in developing. An emulsion made with water impregnated with particles of rust would be likely to cause spots such as those seen in the plate exhibited.

W. H. PRESTWICH exhibited a printing frame for opal plates, and transparency which he considered an improvement upon those he had previously shown. The negative to be printed from, after being placed in the printing frame, is kept from shifting by a small spring. A thin sheet of gutta-percha warmed readily affixes the opal plate to the back of the printing frame, three upright brass pins in the frame keeping the back in register.

A short paper was read by J. HUBERT in reference to a flashing lamp that he had brought down to the meeting for exhibition. The lamp is similar in size and shape to the lamp fixed outside jewellers and other tradesmen's shop windows. It can be hung in any convenient part of the room, connected by flexible gas tubing to one of the ordinary gas brackets. On a small ledge fixed to the centre of the back of the lamp, a d exactly opposite to a horizontal jet of flame, is placed the charge of gun-cotton and magnesium powder, the gas jet having first been turned down to its lowest extent. At the moment of exposure the gas from the bracket is turned on full, which causes the jet in the lamp to shoot out, and set fire to the charge. The lamp is now detached from the gas tubing, taken out into the open air, and the front, which is hinged, is opened, and the smoke set free. To facilitate focussing, a small lamp with reflector is placed in the hand of the sitter. J. Hubert stated that several lamps might be used at the same time, which if connected by one tube to the same gas burner, could be fired simultaneously. He had taken portraits at night with the lamp, which could not be detected from those taken with daylight.

W. H. HARRISON questioned whether with a number of lamps the pressure of gas would be equal to cause it to travel sufficiently rapid to give a simultaneous flash from all the lamps.

A. HADDON said he should give preference to electricity when several flashes were necessary. Three Leclanche cells would be sufficient, and would require but little attention.

J. HUBERT contended that electrical apparatus was difficult to carry about.

W. BEDFORD thought if, instead of fine magnesium powder, it was used in a more granular form, combustion would be more rapid. He had had some experience as an amateur pyrotechnist, and it was his practice to grind the gunpowder before using it, to make it burn slower.

A. HADDON remarked that air-spaces left between the grains would assist combustion. Magnesium powder, if allowed to become oxidized, would have a tendency to burn slower.

J. HUBERT suggested dipping gun-cotton in a solution of chlorate of potash, and drying it.

### DERBY PHOTOGRAPHIC SOCIETY.

The usual monthly meeting was held on Tuesday, March 13th, in Sykes' Restaurant, at 8 p.m., THOMAS SCOTTON in the chair, when ISMAIL SABRY read his paper on "A Summer Trip to Belgium" (see page 186). Mr. Sabry illustrated his paper with a number of photographic prints taken during his visit, and replied to a number of questions put to him by the members.

Several queries in the question-box were discussed and answered, and a number of enlargements, matt-surface, and silver prints were handed round for inspection.

### LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.

The members held their second visitors' evening of the season at the Old Town Hall on Wednesday evening, the 14th inst., when J. T. COOK gave a most interesting lecture on "Round the West Indies and South America with the Camera." The chair was occupied by the President, GEORGE BANKART, and the room was well filled.

Having been briefly introduced by the Chairman, Mr. COOK first traced on a map the route undertaken by him—viz., from Southampton to Barbadoes, Trinidad, Jamaica, and other of the West India Islands, across the Isthmus of Panama, and along the coast of Peru and Chili to Valparaiso and Santiago, and returning via the Straits of Magellan, the Argentine Republic, Uruguay, and Brazil. The lecture, which was full of information



with regard to the countries visited, was illustrated by a series of sixty slides, selected and prepared from 170 negatives taken by himself, and exhibited on a fifteen feet screen by an excellent oxy-hydrogen lantern provided and worked by T. S. and W. Taylor. The views were much appreciated, and illustrated vividly the scenery, physical features, architecture, costumes, and other objects of interest in the various countries. Among the most striking were a series of views on the highest railway in the world, that from Lima up the Andes to a height of 12,200 feet, the snow-clad mountains of Patagonia and Tierra del Fuego, and the wonderful tropical and forest scenery of Brazil and the West Indies. In replying to a vote of thanks accorded to him, Mr. Cook mentioned that he covered 22,000 miles in seven months, and secured 170 good representative negatives on Fry's plates, using Ross' rapid and symmetrical lenses. He also gave some interesting information as to the state of photography in the Great Southern Continent, where he found professionals always ready to assist amateurs.

#### CAMERA CLUB.

On the Thursday evening (March 15th) following the Conference days, exhibitors of apparatus in the exhibition at the Society of Arts visited the Club, and gave explanations of special features in their exhibits. Sir GEORGE PRESCOTT occupied the chair, and some discussion took place upon some of the articles described.

A gentleman representing the firm of Dallmeyer exhibited and described their single combination lens giving straight lines, also a view-meter and new lens-shutter.

LYONEL CLARK handed round one of Wray's lenses, in which one tube was constructed to take either of three lenses of different focal lengths, with adjustment for altering the position of the stops, which were in the form of an Iris diaphragm.

CHARLTON WOLLASTON exhibited his shutters, some in ebonite and mahogany cases, much lighter than the metal cases; also a clock ticking quarter-seconds, and a useful form of stopper for bottles.

On Thursday, March 29th, the subject is "Stereoscopic Photography," paper to be read by A. Stroh. Meeting at 8 p.m.

#### EDINBURGH PHOTOGRAPHIC SOCIETY.

The fifth ordinary meeting of the current session was held (to suit the convenience of the lecturer) in the Chemical Lecture Room of the College of Surgeons on Wednesday evening, 7th March, at 8 o'clock. The President occupied the chair.

The minutes of last meeting were read and confirmed, after which ten gentlemen were elected to the membership of the Society, and five names submitted for election in April.

W. IVISON MACADAM gave a lecture on Spectrum Analysis, illustrated by numerous experiments and diagrams, which occupied the remainder of the evening. The lecture proved to be one of the most attractive which has been delivered before the Society for some time, and was listened to with great interest.

Mr. MACADAM gave a sketch of the progress made in spectrum analysis from the time when Newton made known his great discovery of the compound character of light down to recent researches and advances on the subject. A variety of substances were burned in the electric lamp, and the colour band peculiar to each thrown upon the screen. The photographic bearing of the subject was also made apparent, and particular attention called to what the Lecturer described as the blue or chemical rays.

The PRESIDENT expressed the great pleasure which had been given to the members on this occasion, and moved a hearty vote of thanks to the Lecturer.

#### NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting was held in the Mosley Street Café, Newcastle, on Tuesday, the 13th inst., H. R. PROCTOR in the chair.

After the usual business had been discussed, M. Auty read the following paper on "The Development of Gelatine Dry Plates."

To anyone really caring for high class work, and recognising the absurdity of trying to get such work by mechanically developing all kinds of plates by the same developer, the study of development is most interesting, and it is surprising how much care can be done by those able to profit by such study. As the formula given by each maker differs, I consider it impossible to lay down any precise rules for the development of gelatine plates. In fact, I find it scarcely possible to mix any developer to finish the plate without alteration as it goes on. One must

suit the developer to the exposure and the subject. In my own practice, since the introduction of sulphite of soda in the developer, I use three dishes of solutions of different strengths: one containing the normal developer given with the plates I am using, another strong in pyro, and the third strong in ammonia and bromide solution. I mix all three before commencing to develop, and often use the same solutions for an hour, occasionally adding a little ammonia to the normal developer. With these three solutions I can develop anything like a properly exposed plate. For exposures made in the studio I usually start with the normal developer, but for exposures in the field I commence with the pyro solution, and from the time it takes the image to appear I can at once tell how to proceed. When the exposure has been too much for the normal developer, I transfer the plate to the strong pyro solution, and get much better results than by first washing the negative under the tap as some recommend; but where the image is long in coming out, I wash well under the tap, and redevelop in the strong ammonia and bromide solution. For instantaneous exposures such as one gets at the seaside, where there are no very deep shadows, I commence in the strong ammonia and bromide, and frequently have to work up sufficient density in the normal developer; but where there are deep shadows, such as in street views, boats with sails, &c. (such subjects always being under-exposed) I soak the plate in ammonia and water, the proportion being about two minims ammonia to four ounces of water; and as they require much forcing, I find this assists in bringing out the detail. Where much over-exposure is suspected, soak the plate in a pyro and bromide solution first, but never bromide alone, as it destroys the power of bringing detail out in the shadows. I have, therefore, arrived at the following conclusions:—Always expose thoroughly, and do not try instantaneous pictures where there is not light enough to impress them; where the action of light has been excessive, a modified developer will give a good negative. An instantaneous picture exposed in a bad light cannot be developed into a good negative, but a plate over-exposed can be developed by a suitable developer.

An interesting discussion followed, in which J. B. Payne, F. Green, T. Galloway, J. Pike, H. R. Proctor, E. G. Lee, and others took part.

The subject for discussion at the April meeting will be on "Instantaneous Shutters," to be opened by H. C. Proctor.

#### MANCHESTER AMATEUR PHOTOGRAPHIC SOCIETY.

The monthly meeting was held on Tuesday evening, at the Manchester Athenæum, the President, the Rev. H. J. PALMER, M.A., in the chair. The following gentlemen were elected members:—John Bardsley, Charles Bond, P. W. Bryan; J. C. Husband, J. F. Moseley, Edgar Pickard, J. A. Smith, and J. W. Welch.

J. W. WADE, one of the vice-presidents, read a paper on the "History of a Lantern Slide." The paper was a description of Mr. Wade's method of making lantern slides, and showed the history of a slide from the time it was purchased from the dealer, through the various processes of exposure, development, fixing, reduction, intensification, and mounting, to its final exhibition in a lantern.

The PRESIDENT, in commenting on the excellency of the paper, mentioned that Mr. Wade had been awarded the bronze medal at the Liverpool International Photographic Exhibition, for the beauty and excellency of his lantern slides.

R. O. GILMORE gave a demonstration of the flash light as used in photography. He explained that the light from burning magnesium was sufficiently actinic to take photographs by, but burnt alone it was too slow to take portraits. By mixing powdered magnesium with gunpowder the light burnt much quicker, but the smoke and fumes from the gunpowder rendered the use of this mixture impracticable in ordinary rooms. Mixtures of chlorate of potash and other chemicals with magnesium give good results, but the use of chlorate of potash was extremely dangerous, whilst gun-cotton dusted over with powdered magnesium gives a flash light that is practically instantaneous, gives off very little smoke, and is quite as safe as the gas we use daily in our homes. Gun-cotton is explosive only when burnt in a confined space, as in a cannon or a hole drilled into a rock for blasting purposes. To show this Mr. Gilmore took a piece between his finger and thumb and applied a lighted taper. The gun-cotton burned quickly with a flash, but noiselessly and without danger. Mr. Gilmore proceeded to exhibit and explain his method of firing the charges of gun-cotton and magnesium. For dark interiors, such as a crypt or the interior of a cavern, it



would be necessary to fire several charges from different points. This could be done one by one, or, better still, simultaneously, by passing a current of electricity through fuses placed in the gun-cotton. To show the application of this, Mr. Gilmore exhibited apparatus and fired off simultaneously three charges of gun-cotton and magnesium in different parts of the room. The apparatus used was entirely home made, and it was shown that any amateur could construct similar apparatus in a short time and at the cost of a few shillings. For portraits all that is required is an empty biscuit tin with a small spirit lamp placed inside, a suspended cage to hold the gun-cotton, and a wire by means of which the cage can be drawn into the flame of the spirit lamp. Reflectors of white paper are used to prevent too dark shadows.

Mr. James sent one of his patent lamps for exhibition. The lamps are constructed of one or more argand gas burners. These are connected by tubing to a gas supply, and the gas lighted. Charges of powdered magnesium are placed in a conical box behind, and, by means of tubing, blown through the centre of the gas flames. Several members had brought their cameras, and plates were exposed on groups of the members, some lighted by Mr. Gilmore with his apparatus, and the others by the Secretary with the James patent lamp, the results to be shown at the next meeting.

#### CHESTER SOCIETY OF NATURAL SCIENCE.—PHOTOGRAPHIC SECTION.

THE usual monthly meeting was held on Thursday, March 8th, E. W. PARNELL in the chair.

A paper was read by the Rev. A. H. FISH on "Light and Colour," which he illustrated with lantern slides and a number of very interesting experiments, showing the formation and action of the light waves, and the effect of passing light through various coloured glasses and solutions. The properties of the spectrum were demonstrated by means of the oxy-hydrogen limelight, and a train of quartz prisms and condensers (which were kindly lent for the occasion by Messrs. Yeates and Sons, of Dublin); and a print of the spectrum taken on bromide paper was developed and handed round for inspection, eliciting great interest, on account of the prominence of the photographic ultra-violet rays.

It was decided to take the photographic weekly papers; to form a library in connection with the section; and to ask for contributions of books, &c., from members.

#### SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

On Wednesday evening, Feb 29th, the regular monthly lantern exhibition was given, comprising about forty of the one hundred slides contributed by the St. Louis Association of Amateur Photographers, in addition to several slides by John E. Dumont, and a few other members of the Society. The pictures of the St. Louis Association attracting the most attention were those of subjects foreign to St. Louis. Several views of the public buildings and Mississippi steamboats were shown.

A few slides by Franklin Harper were much admired, and about thirty slides by C. Cobb, made mostly from other members' negatives, were quite brilliant and were very much liked. Mr. Cobb, it should be mentioned, has acquired considerable skill, by long practice, in making lantern slides by contact, using an artificial light, and employing as a developer the Beach sulphurous acid pyro, in combination with an alkali solution composed of potash and soda. His slides had a very agreeable brown tone, were extremely clear in the high lights, proving, that with care and skill, pyro as a lantern slide developer is a success, and much more rapid than hydroquinone.

Mr. Dumont's work was greatly admired, being superior in technical excellence and artistic merit. Among those of his slides which were especially liked was one entitled "Milking Time," representing a milkmaid about to step over a fence, with the cows standing in the foreground under a tree; the picture was very suggestive and effective. In "Au Old Mill Wheel," surrounded by dense foliage alongside a small brook, the detail was exquisitely rendered, and the lighting very soft; the slide had been toned, and was of a peculiar, charming warm brown colour.

Altogether, the exhibition was very interesting and instructive, and showed that lantern-slide making is becoming attractive.

The Boston (Mass.) joint exhibition of the Philadelphia, New York, and Boston Photographic Societies is to be held at the Art Institute in Boston from May 5th to May 12th next.

## Talk in the Studio.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The usual monthly technical meeting will take place on Tuesday, March 27th, at 8 p.m., at 5A, Pall Mall East. Doors open at 7 for reading of journals and for conversation.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—An excursion to St. Albans has been arranged for Easter Monday. Members will leave King's Cross by the first train after 10 a.m., meeting at the Peahen Hotel, St. Albans, at 12 noon.

PHOTOGRAPHIC CLUB.—The meeting on March 29th will be a lantern night, and the discussion will be on "Lantern Matters." The address of the Hon. Secretary will be 83, Corinne Road, Tufnell Park, N., instead of 1, Beacon Hill, as heretofore. Bank holiday outing at St. Albans. Meeting at the Peahen Hotel, at 12 o'clock.

## To Correspondents.

\* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

GUNOY.—We should prefer Nelson's No. 1 for the purpose, but in this case the quality of the gelatine makes but little difference, as long as it is free from any impurities which will cause the reduction of the silver salts.

W. ADCOCK.—Thank you very much for the photograph, also for the promise for the future.

GROVE.—1. Use wood which is thoroughly dry—an old shelf which has long been in a kitchen being the sort of thing to use; and moreover, there is seldom any objection to exchanging such a shelf for a new board. 2. When planed up and grooved, soak the parts in boiled linseed oil. 3. Use about equal parts of putty and ground white lead. 4. When dry, paint with Brunswick black to which about one-third of boiled linseed oil has been added.

SHUTTER.—For yachting subjects we regard Dallmeyer's rapid landscape as the best; and as to the other matters, you may fairly well take the advice of any respectable dealer in photographic goods.

VETO.—1. We could only answer your question if we were in the first place to know every point in relation to the patents, and if we were in a position to form an infallible judgment regarding very complex questions of fact and law. 2. There has been no such lawsuit.

W. F. W.—Piper and Carter, of 5, FURNIVAL STREET, publish a shilling book on "Photographic Painting," by A. H. BOUL. This will give you (page 26) all the information you want. Sometimes a trace of ammonia in the water used for moistening is an advantage.

ADRIAN SMYTHE.—The formula given by Ashman and Offord on page 201 of the YEAR-BOOK, gives excellent results.

H. D. ATKINSON.—Next week.

J. K. C.—The ruled tint plates can be obtained from Hughes and Kimber, Printers' Brokers, East Harding Street, Fetter Lane, London; but we do not know of anyone in this country who keeps the prepared bitumen in stock. A convenient solution of ordinary bitumen is that sold by Hopkin and Williams, of Cross Street, Hatton Garden, under the name of "Liquid Jot"; it requires dilution with benzole.

ALFRED COX and Co.—He is clearly a professional photographer, although from the lowness of his prices one may perhaps assume that his work is not very highly appreciated; still, there are photographers in London whose charges are even lower.

G.—We have made some enquiries, and the result is, we think, that the most useful articles will be obtained—not through commercial channels—but by securing the co-operation of amateur workers in various parts of the world. We will write to you.

CHARLES.—(1). We are under the impression that they come within the range of prohibited articles, as far as the Parcel Post to Germany is concerned. Either enquire at the General Post Office, or wait for the appearance of the April issue of the Postal Guide. (2). Perhaps, in this case, your best way will be to communicate with the director of the Postal Union, at Berne, Switzerland.

BLASH.—It is practically insoluble in alcohol, and we think that you have been using the wrong substance. Write again and ask what is intended.

F. F. COX.—If damaged by rust, it must be re-ground and oilstoned, operations which you had better not undertake unless you know how to work true to a straight-edged ge.



# THE PHOTOGRAPHIC NEWS.

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### A PHOTOGRAPHIC TESTING COMMITTEE.

As the suggestion has recently been made again that it would be well to have a committee of reference who should, on receipt of a remunerative or nominal fee, report on the quality of lenses and photographic materials in general, it will be opportune if we make a few remarks upon the feasibility of the plan.

The Kew Committee is generally taken as the example of what is desirable, and the success attending the department at Kew that experimentally tests certain instruments, is an additional incentive to those who urge the adoption of a similar principle by photographers. The greater number of the instruments verified at Kew are thermometers, hydrometers, barometers, and watches. In each case, be it noted, the apparatus owes its value to the regularity of its performance, and to its agreement with acknowledged standards. Given the scientific ability in the observer, it is an easy matter to say whether one thermometer agrees with another, whether a watch keeps good time, and so on; and if there is a lack of agreement, it is not difficult to express the variation in an absolute way. But everything depends upon the standards, and the chief value of a verification at Kew is due to the fact that the standard instruments there are as reliable, probably, as any that are to be found.

If it were possible or wise to adopt certain definite standards of comparison for photographic apparatus and materials, there would be little difficulty in making the comparisons with these standards, but the results of such a procedure would be of very doubtful value. What, for instance, shall be the standard weight for a camera? In a camera for outdoor work, it is generally desirable to have the maximum of stability and convenience with the minimum of weight; but probably no two photographers would be found to agree in their notions as to how these properties should be balanced against each other. One operator will wisely sacrifice stability for lightness to an extent that would be folly on the part of another operator. And moreover, if such details could be finally decided upon, each photographer would probably prefer to test his apparatus for himself.

In sensitive material, there is no uniform standard that it is desirable to always equal. For negative work sometimes rapidity is important, but occasionally a moderately slow plate is more useful. And, again, there is no absolute test for rapidity, because rapidity is a question of the light employed. An orthochromatic plate may be less sensitive to daylight, but more sensitive to gas-light, than a given plate of the ordinary sort.

But perhaps it is more especially in the matter of lenses that the usefulness of a reference committee would be expected, and at first sight there does seem to be more scope here for the functions of such a body. But those

properties of lenses that are at the same time most doubtful and most important are relative only, and if any standards could be agreed upon by opticians, they would probably be unintelligible to the large majority of photographers.

Perfection in a thermometer or a watch, although difficult to attain, involves a very simple idea; but the possible perfection in a lens is the result of the elimination or minimizing of many possible errors, the testing for which cannot be done in one operation.

Therefore, while there is much that might be done by a photographic testing committee, its work would be very different from the verification of instruments at Kew, and it would have to be preceded by a general agreement as to standards, which would be difficult to secure. It appears that there would of necessity be so much that was chiefly matter of opinion in any report upon photographic apparatus or material, that probably those photographers who would be able to appreciate a report would prefer to do the testing for themselves. The actual user of a camera ought to be a better judge of the value of its conveniences to himself than any committee bound to work only upon general and fixed lines.

### "PHOTOGRAPHY IN NATURAL COLOURS."

#### ACTION AGAINST THE PHOTOGRAPHIC COMPANY.

For some time past an action has been pending between Mr. Comber and the Photographic Company arising out of certain statements contained in the advertisements issued by the promoters of the Company, on the faith of which statements Mr. Comber was induced to take shares. We have already expressed our opinion in regard to the misleading character of the phrase, "Photographs in Natural Colours," and we need only say now that nothing said by Mr. Justice Kay is at all at variance with that opinion. The whole points of the case turned upon this: whether Mr. Comber was deceived by the statements in the advertisements. In such a case a good deal depends upon the applicant's own action in the matter, and this did not impress the judge favourably; firstly, because he admitted not having read the prospectus; and secondly, because directly his suspicions were aroused by what appeared in the *PHOTOGRAPHIC NEWS* he did not at once apply to have his name struck off the list of contributories. On the other hand, Mr. Justice Kay very properly took exception to the assertion that the Company were not responsible for the advertisements, and that the statements were introduced by the agents employed to float the Company.

In the Chancery Division of the High Court of Justice on Friday last, a motion was made before Mr. Justice Kay, on be-



half of Mr. William Henry Comber, described as a journalist, against the Photographic Company, to obtain the removal of his name from the register of shareholders as a holder of 500 shares, and the return of £25 paid by him on application for such shares.

Mr. Ince, Q.C., and Mr. Eustace Smith appeared for the applicant; Mr. Marten, Q.C., and Mr. Cary were counsel for the Company.

Mr. Ince stated that it had been a great desideratum in the photographic world for some time past to take photographs in colours, so that instead of getting a mere light and shade picture, a photograph would reproduce objects as existing in life and nature. The applicant in this case having seen an advertisement in the *Standard* and *St. James's Gazette* of the 22nd of November last, in which the Photographic Company represented that they had discovered this art of photography in colours, made his application for shares upon the faith of this statement. Afterwards, through the medium of the PHOTOGRAPHIC NEWS, he learned that no such power or invention existed, and that what the company called photographing in colours was merely a modification of an old process known as *crystoleum*, which consisted in producing a photograph upon glass, and then adding rough colouring at the back. Upon making this discovery, Mr. Comber refused to pay the allotment money demanded of him, and insisted on the return of his application money on the ground of misrepresentation. The Company was formed in November last with a nominal capital of £100,000 in £1 shares, for the purpose of acquiring the businesses of the Cellieric Syndicate (Limited), of Mr. Vernon Heath, the well-known photographer of the Pall Mall Gallery, and the Cellieric-Parkes patents or processes for improvements in the production of coloured photographic pictures. The learned counsel said that the prospectus of the Company stated that "The English Patents which will be acquired by the Company are for the production of coloured photographic pictures, which not only embraces photography in general, but that of landscapes, animal life, and, what is most important of pictures, which can be faithfully reproduced in facsimile colour at a trifling cost:" and that by the Cellieric-Parkes processes (whose patents the Company was about to acquire) registered marks, designs, millinery, hats, carpets, furniture, and all other like objects can be reproduced in exact colours and form." He contended that the prospectus made a direct representation that the Company had a process for photographing in colours, and anybody reading the prospectus would come to the conclusion which Mr. Comber came to, namely, that there would be a reproduction by the photographic process itself not only of light and shade, but of the actual colours in nature. The applicant had sworn an affidavit in which he stated that he had not read the prospectus itself, but was induced to apply for shares in consequence of the advertisement which he read in the *Standard* and the *St. James's Gazette*, which was an abridgment of the prospectus, and represented that "the photographs are permanent, no surface colours or dyes being used." On the part of the Company it was said that the advertised abridgment of the prospectus had been prepared and inserted without their authority by the advertising agents, the London Scottish Mercantile Investment Trust and Agency (Limited), and that on discovering the discrepancy between that advertisement and the prospectus they published a correction in the PHOTOGRAPHIC NEWS. The applicant had also sworn an affidavit, in which he said, "I believe that the company was about to acquire a patent for photographing in colours; that is, that coloured photographs could be produced direct from the negative by some chemical or mechanical process, and that the painting of the photographs by hand would be dispensed with. Had I understood from the said advertisements that the patented process was a process of colouring photographs by hand, I would not have applied for shares in the company." Having read certain articles in the PHOTOGRAPHIC NEWS, in which the pretensions of the Company were discussed, Mr. Comber came to the conclusion that he had been deceived, and in reply to a letter from the secretary asking him for payment of his allotment money, he wrote refusing to pay the money, demanding the return of his deposit on the ground of the impudent misrepresentations in the prospectus, and threatening proceedings.

Mr. Justice Kay, without calling upon the counsel for the company, said that in his opinion the motion must be refused. Two things were necessary to be proved when a man came to set aside a contract on the ground of misrepresentation. In the first place, he must prove the misrepresentation; but that alone would

not help him: he must also show that he was misled by it. His Lordship then, having referred to Mr. Comber's evidence, said that the mode in which it had been prepared made him very much doubt the *bona fides* of the present application. Having regard to the terms of the prospectus, it was difficult to suppose that any man of intelligence would be led to believe that colours in photographs could be produced by the action of the sun. In his Lordship's opinion, there was not a single word in the prospectus to mislead a man of ordinary intelligence. There was sufficient in it to show that the colouring was to be done by hand. He had been asked to believe Mr. Comber did not read the prospectus, but it was hard to believe that a man who signed the form of application for shares sent with the prospectus, did so without reading the prospectus itself. Mr. Comber, however, said he did not. In his Lordship's opinion, that gentleman's memory on the subject was defective. What gave him the notion of repudiating his shares seemed to have been the observations in the PHOTOGRAPHIC NEWS pointing out that the prospectus as advertised contained statements that were false and calculated to mislead. Even then he did nothing until he received a request from the Company to pay up the allotment money on his shares. His Lordship was asked on this evidence to take Mr. Comber's name off the list of shareholders. It was not until he saw this notice in the PHOTOGRAPHIC NEWS that it occurred to him that he might raise the question whether he could not recover his deposit money, and this was obviously suggested by the article in that journal. It was unfortunate he could not produce the prospectus he received. His Lordship did not feel inclined to release him from his contract. He was sorry to see that it had been suggested that the Company was not responsible for the advertisement, and that it was done by the agents employed to float the Company and issue its advertisements, and that the abridged prospectus was not published on the Company's own responsibility. If it were proved to him that any one had taken shares on the faith solely of that advertisement, he should release him from his position. Such a case as the present must be treated strictly; the onus of proof must be on the applicant. In his Lordship's opinion, this gentleman had not been deceived, and therefore the application must be refused with costs.

#### THE DIRECT PHOTO-ENGRAVING COMPANY AND ANOTHER v. AUGUST AND CARL HENSCHEL.

This case has considerable interest, even outside photography, as bearing on the question how far a servant is legally bound by an understanding that he is not to divulge trade secrets. At the same time, one may well doubt whether there are any secrets in connection with the work of the Company, unless one may call those things "secrets" which have been published over and over again in the PHOTOGRAPHIC NEWS.

We reprint the rather full account given in the *Times*.

DIRECT PHOTO ENGRAVING COMPANY AND ANOTHER v.  
AUGUST AND CARL HENSCHEL.

Mr. Bigham, Q.C., and Mr. Oswald were for the plaintiffs, Mr. Greene, Q.C., for the defendant Carl Henschel, and Mr. Spokes for the defendant August Henschel.

This was an action for damages against the defendant Carl Henschel, for certain unlawful acts done by him—such as circulating reports about the plaintiff company, calculated to do them injury, and inducing their workmen to leave their employment also against both defendants to restrain them from divulging the secrets of a method belonging to the plaintiffs, by which copies of pictorial and graphic illustrations from nature, &c., are rapidly and cheaply produced and multiplied; also to restrain defendants from issuing a circular containing certain statements concerning defendants' relations with the plaintiff company.

The first witness was Colonel Mallinson, who, examined by Mr. Oswald, said,—I was chairman of the plaintiff company in 1881, and knew defendants as servants of the company. The defendant Carl was apprenticed for four years. He was never working manager. In May, 1887, I heard that our workmen were being tampered with. On this I called a board meeting, and summoned August and made certain complaints. He made no denial. In the result he was discharged. Many of our workmen left the next day. There was a falling off in our



receipts, and some firms transferred their business from our company to the defendant's, who had then set up in the son's name—Carl Henschel. In 1887 there was a falling off in our business to the extent of £2,000.

Cross-examined.—Carl was never returned to the Inland Revenue by me as manager.

Frank Perry, examined by Mr. Bigham, Q.C.—I have been secretary of the plaintiff company since 1884. Defendant Carl was never our working manager. August, the father, originally was, and continued till 1886; after that he remained on, being asked to renew. Carl has taken premises in Fleet Street, about 300 yards from ours in Farringdon Street. The whole secret of the process is in the preparation of the paper with which an invisible picture is taken from the negative. This saves the use of the mirror used in the ordinary process, and procures a finer contact. In March, 1887, Carl gave notice. He made no complaints, but said he was going for a holiday to Paris. He stayed on five days after his notice was up. Twelve of our men almost immediately left us. I heard they were working with Carl. In May, August was summoned before the board in consequence of certain reports. He made no denial to the charges made against him. He was then discharged. The company lost the custom among others of the *Illustrated London News*, *The Lady*, and the *Lady's Pictorial*.

Cross-examined by Mr. Spokes.—The company were frequently in temporary difficulties, and had to raise money on bills at the time of the board meeting. Perry, the director, was not actually registered as the holder of 300 shares. That was an oversight. The gas was on one occasion cut off through my negligence in not sending a cheque. I do not know that we had then a balance, but we had credit at our bankers. Some of the workmen knew of this incident. We complain of August having divulged the secret to Carl, who assisted him when they were both in our employment. Our process is not patented.

Cross-examined by Mr. Greene, Q.C.—We did not cut down our staff after the defendants left us. We saved their salaries and about £5 a week, so that our expenditure was about £1,200 a year less than formerly. Carl was never acting manager for his father when he was away, but either he or I would act for him in such a case. There was a workman who knew the secret as to the preparation of the paper. The company has paid no dividend that I know of since its formation, nor have the directors received any fees. After Henschel's departure, Mr. Turner, a customer, made complaints as to the "tinting" in some work done for him. He has not employed us since.

Re-examined by Mr. Bigham, Q.C.—No more complaints have been made since the Henschels left us than are usual in business. There are always some customers who are dissatisfied.

Mr. Greening, examined by Mr. Oswald.—I used to occupy premises in Fleet Street, which Carl afterwards occupied. I had left, and in December, 1886, August came and asked me about the premises, as his son, I understood, wanted to take them.

Charles Wilson, examined by Mr. Oswald.—I let premises in Fleet Street to Carl at £250 per annum. Saw August about often. A distress was put in—in error—and August complained to me and threatened an action.

Cross-examined.—I had a billiard-room and bar on the premises, and he often came for a glass of beer.

A. Quithenden, examined.—Carl told me if I went to work for him he would give me more money than I earned with plaintiffs. August also spoke to me on the same subject, asking me if I was going to do the same as the others. The others had gone to Carl's, I knew.

Cross-examined by Mr. Greene.—When August was away we took our orders from Carl.

A. Coleman, examined.—Was originally with the plaintiffs. At Carl's request left and worked for him till September last. Saw August about. Paper was used by Carl of the same colour as the plaintiffs used to use. Cannot say it was the same. Taken as a whole, the process in both places was the same.

Cross-examined by Mr. Greene.—I took orders from Carl when at the plaintiffs'. I knew he was leaving before he told me. I do not know the secret of the paper. I left him on my own account. I had been reprimanded, and then gave notice.

William Jeffries, examined.—Was with plaintiffs'. Remember Carl leaving. A week after, he sent for me to Fleet Street, and asked me to give a week's notice to the plaintiffs and work for him. Eventually I did so, and did same work for him I used to do for plaintiffs. The work seemed to me to be the same in both places. I often saw August there walking about smoking.

Cross-examined by Mr. Greene.—At plaintiffs' I used to wash zinc plates at 9s. 6d. a week. Carl at first gave me 9s., afterwards 9s. 6d. Mr. Temple asked me first to call on Carl. He was a clerk of the plaintiffs. My work was the same. Carl dismissed me at the end of October. In November I was sent for by plaintiffs.

Jem Smith, examined.—After Carl left, one Thorne asked me to call on him at Fleet Street. He asked me to leave plaintiffs'. I said yes, if he would give me a rise, which he did. I, however, stopped where I was. Thorne was my foreman. He went to Carl's.

Frederick Pew, examined.—I am photographer to plaintiffs. I know we use paper in our process. The advantage of use of paper is a "finer" result.

Cross-examined by Mr. Greene.—I am the person who has the secret of the paper. I can and have prepared it. There are several firms doing the same work. I could not tell from the work itself by what process it is done. I have not seen Carl's method.

Re-examined.—The advantages of plaintiffs' secret process are in the working.

This concluded the plaintiffs' case.

Mr. Greene, Q.C., on behalf of defendant Carl, submitted there was no evidence that he was using the same paper as plaintiffs use. Moreover, under his agreement, he is only bound not to divulge. He is not prevented from using or making it himself.

The Court then adjourned till 11 o'clock on Friday morning. Lord Coleridge, in answer to Mr. Greene's arguments, held that there was some evidence to go to the jury as against the defendant Carl Henschel.

Mr. Greene, Q.C., then opened the defence for Carl Henschel. The learned counsel urged that the questions for the jury were not questions of morality—of smart trading. The question was, Were the plaintiffs entitled to relief under the three heads under which they claimed? Where was the evidence that Carl had ever made any false or detrimental representations to a single soul concerning the plaintiffs? Again, what harm was there in Carl's saying in his circular that he had been plaintiffs' working manager? In fact he was, at any rate when his father was absent, which his duties towards the company often necessitated. What damages had the plaintiffs suffered through the circular? Doubtless it was gall and bitterness to them to find that their tower of strength had left them and was working on his own account for persons who had once been their customers. Again, what title of evidence was there that Carl used the process his father had sold for 2,000 shares in the company to the company? The witnesses called were the merest subordinates, plate washers and others, who neither did nor could appreciate the minute details contained in the recipe which formed the secret in the case.

Mr. Spokes followed on behalf of August, and urged that there were no disclosures by August to Carl after 1881, that Carl's process was an improvement on August's and not the same, that August had no interest in Carl's business, and that there was no evidence that he had ever had anything to do with the circular or made any representations concerning the plaintiffs. Moreover, he had a counter-claim for his dismissal, which was for his supposed tampering with the plaintiffs' employees. It would be absolutely against himself for the plaintiffs' business to be injured, for by the terms of his agreement he could not work or take part with any one else in the world in the same line of business. Therefore this was his sole means of livelihood—to remain with the plaintiffs.

Carl Henschel, examined by Mr. Greene, Q.C.—I was born in 1864, and lived at home till I was 16 or 17. Prior to 1880 my father and mother worked at chemical processes at home, at which I assisted, especially one connected with photo-lithography. I became assistant to my father, who was general manager. Our process was used by the company. The particular process was that of the manufacture of the paper. My father's process failed 19 out of 20 times. My process is quite different, and is far superior and shorter. The only point in which they agree is that both our papers are black. I have never used in my business my father's process or recipe for the paper. I use different chemicals both in substance and quantity. I have never disclosed my father's recipe. I saw Mr. Foster, an ex-secretary of the company, taught it on one occasion. I used to control the men and works. My father was working manager, but I gave all instructions, paid wages, and engaged and dismissed the men. After I left I issued my circular, in which I said I had been



working-manager. I have never made representations as to the plaintiffs being in an unsound state.

Examined by Mr. Spokes.—My father has never since 1881 divulged the formula to me. I knew it before that year. I learnt it from my mother. The business at Fleet Street is entirely mine.

Cross-examined by Mr. Bigham, Q.C.—I knew the secret when my father sold it to the plaintiffs. He told them, I believe; I did not. My paper to the eye is like my father's. My method may be called an improvement on my father's secret. My father is an undischarged bankrupt. He made inquiries at my request concerning my present premises in Fleet Street. The men did not leave the plaintiffs until three weeks after I left. I asked them to come to me. I believe I was in my rights in doing so. I have said I was afraid after I left them the plaintiffs would not get on so well. This I said to Collier after he had left the plaintiffs, and in answer to something he said. He is here as my witness. I procured my workmen to swear that they had not been asked to leave by me. Their affidavits had a family likeness. I did not hear the Chancery Judge's remarks on the subject. I think all those men are now in Court. My circular was printed a week after I left, and sent out on May 1. I sent them to most of the company's customers.

Re-examined.—My father did not even see it before it was sent.

Mr. Marr, examined by Mr. Greene, Q.C.—I am manager of Unwin Brothers. Knew Mr. Carl at plaintiffs'. He always took my instructions. When he started I took him our business. I did so in order to get the work done properly.

Examined by Mr. Spokes.—It is usual in our business to give a manager six or, at any rate, three months' notice.

Cross-examined by Mr. Bigham, Q.C.—Anyone who set up his son in business on the sly would deserve no notice at all. I did not rely on the father at all when I sent my work to the son. In fact, I hardly knew August. It was after I got a circular I went to Carl.

Mr. Turner, examined by Mr. Greene, Q.C.—I am the husband of Miss Claxton, the artist, and attend to her business affairs. I used to have business with the plaintiffs, and always saw Carl. I understood him to be sub-manager. After he left I had reason to complain of their work more than once. I remained on with them as their terms were satisfactory. Eventually I went to Carl because the company's secretary threatened to tell my clients what prices I paid them if I left them. I call it blackmailing.

Cross-examined by Mr. Bigham, Q.C.—He threatened to expose my profits. I took it as a threat. It was not that if I left them they would try and get the orders direct.

William Pitt, examined by Mr. Greene, Q.C.—Was workman at plaintiffs' for seven years? Carl paid wages and engaged and dismissed the hands. I went to work with Carl.

Cross-examined by Mr. Bigham, Q.C.—Henschel brought me an affidavit, which I swore before two gentlemen. Carl had asked me to leave after he left.

Re-examined.—I left entirely on my own accord and to better myself.

Mr. Darton, examined by Mr. Greene, Q.C.—I am a member of Darton and Co., publishers, and have known Carl as plaintiffs' manager, as I understood. I have given Carl business since he started, but have not left the plaintiffs. Neither of the Henschels has ever made any statements to me about the plaintiffs.

Cross-examined by Mr. Oswald.—I cannot say when I first knew Carl as manager. He never said he was manager. When he was on his own account he never asked me for an order, but may have looked as if he would like one.

August Henschel, examined by Mr. Spokes.—I was a pupil of the celebrated Daguerre. Before I and my son were with the plaintiffs, my son assisted me. He could see everything I did. I have never received any "money" for my secret from the plaintiffs. I received 2,000 fully paid-up shares of the nominal value of £2,000. They are, I consider, worthless. I received £400 a year salary, and should be glad to be with them still. I was away from business a good deal trying to discount bills for Mr. Johnson, a director, and for the company. There were occasional difficulties. The formula not only contained the names and proportions of the chemicals used, but the whole process of preparation most minutely. It was a long affair. I have never since the date of agreement divulged my secret to any one. The German chemist Grunn is my brother-in-law, and my son has from his earliest youth experimented in chemistry. All my family take great pleasure in that science. I think my son's secret was much better than mine. It was not the same com-

pound at all. As to the Fleet Street premises, I merely negotiated for my son with the late tenant. I have no share at all in my son's business. I never got any men to leave the plaintiffs, nor did I ever slander the company to them. I never neglected their business at any time. On May 6th I was accused of tampering with the men. I was taken by surprise. I denied it, and then said nothing, as Colonel Mallinson was in such an awful passion. I never admitted being guilty. I have never been paid anything since. I was discharged on the spot. I should have had three or six months' notice. I have never broken my agreement or slandered the company. I had nothing to do with the circular.

The Court then adjourned till Saturday at 10.30.

August Henschel examined by Mr. Greene, Q.C.—When I was away my son acted for me as manager. The secretary of the original company knew my secret.

Cross-examined by Mr. Oswald.—When I was made a bankrupt I was receiving £400 per annum from the plaintiffs. They knew I was at that time trading in patents on my own account. I am now supported by my son. I make him no return, either in the way of advice or otherwise. I have been a digger in Australia, a bagmaker in New York, an hotel keeper, a theatrical manager, and a "patent collar" maker. I never told the company when I sold them my secret that my son knew it. The original company sold to the plaintiffs. I received shares from both companies. I have never said that without me and my son the plaintiffs could not carry on their business. I never tampered with the lad Pitt or anyone else to get them to work for my son. I have never asked the plaintiffs' customers to take their work to my son. I never heard of or saw his circulars until they were issued. I consider his circular was, in fact, true. I have heard from my solicitor that Mr. Justice Kay, in certain Chancery proceedings, said that the circular was most dishonest and its contents untrue. My counsel then gave an undertaking to discontinue the issue of the circulars. When I was dismissed I refused to take a cheque. I considered the company's position bad, but I have never told any one so.

Re-examined.—I was served with a writ in this action four days after I was dismissed.

Mr. Hart, printer of the *Lady* newspaper, examined, said he knew Carl when he was with plaintiffs. He had since given him work, but had not taken away on that account his work from the plaintiffs. He distributed his work among several firms. This concluded the defendants' case.

Mr. Greene, Q.C., for Carl Henschel, contended that he, being an infant at the date of the agreement, was under no obligations to the plaintiffs. Counsel relied on "*Massam v. Thorley's Cattle Food Company*" (6 Ch. D. 575).

LORD COLERIDGE.—I shall hold on the authority of "*Morison v. Moat*" ("9 Hare," 241), in which "*Prince Albert v. Strange*" (2 De G. and S. 652, 697) is cited, that "if a man obtains certain knowledge, under circumstances which constitute a moral obligation, he can be restrained from disclosing such knowledge."

Mr. Greene, Q.C., then addressed the jury for Carl Henschel and urged that in this Court at any rate, the sins of the father should not be visited on the son.

Mr. Spokes having addressed the jury for August Henschel, Mr. Bigham, Q.C., replied on the whole case.

Lord Coleridge then proceeded to sum up, leaving the following questions to the jury:—

1. Did Carl learn from August his secret when August was bound not to divulge it? Answer.—Carl knew it before. 2. If so, has Carl used the secret? Answer.—Carl has used the process. 3. Has Carl slandered the plaintiffs? Answer.—Yes, 40s. damages. 4. Has August divulged his secret to anyone? Answer.—Yes, to the officers of the company (see also answer to No. 1). 5. Has he used it to the detriment of the plaintiffs? Answer.—Yes. 6. Has he slandered the plaintiffs? Answer.—Yes, 40s. damages. 7. Had the plaintiffs just cause for dismissing August? Answer.—Yes.

The case being resumed on Monday, Mr. Oswald, on behalf of the plaintiffs, asked for judgment and for the injunctions sought for.

Lord Coleridge.—There will be an injunction against August to restrain him from disclosing his secret; his counter-claim is dismissed with costs; judgment against Carl and August in respect of the slanders, with costs; injunction against both restraining them from slandering the plaintiffs; judgment for Carl in respect of his having obtained and used August's secret.

Mr. Greene, Q.C.—I ask for a certificate for a special jury.



Lord Coleridge.—Certainly.

Mr. Bigham, Q.C.—I ask for general costs against the defendants.

Lord Coleridge.—They will follow the event.

Mr. Oswald.—I ask your Lordship for the costs in the proceedings before Mr. Justice Kay.

Lord Coleridge.—I shall do nothing in that matter until I have seen the learned Judge.

Mr. Spokes.—I submit to your Lordship that there was no evidence that August had used his secret at all.

Lord Coleridge.—That was entirely for the jury to find to their satisfaction.

Mr. Spokes.—As to the divulging of the secret to the company's officers, my Lord—

Lord Coleridge.—That is for you to fight about hereafter, Mr. Spokes.

## THE PROGRESS OF THE PHOTO-MECHANICAL PROCESSES IN GERMANY AND AUSTRIA.

BY HERMANN E. GUNTHER.\*

No. II.

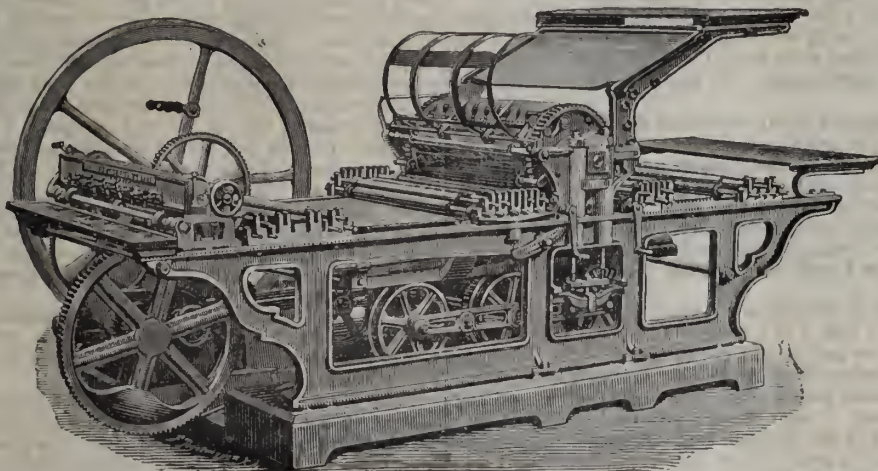
By far the most machines for collotype are constructed by the manufactory of steam printing presses of Schmiers, Werner, and Stein, of Leipzig. These machines, which are admitted to have given very satisfactory results, have been in use by preference to all other systems, in all first-class

collotype establishments for the last ten years. They are supplied in four sizes, the price varying between 4,500 and 6,400 marks, according to the size of the printing plate. The sketch below shows the general features of the Schmiers, Werner, and Stein machine, one of the principal advantages of which is, that in using it, the breaking of the glass plates is almost impossible, which is not the case with other systems. As to the details of working with a machine of this kind, I may refer to pages 129, 177, and 242 of the previous volume of the PHOTOGRAPHIC NEWS, where collotype printing at the power machine has been very ably described.

As regards photo-lithography, the well-known firm of Jaffé and Albert, of Vienna, which at the last convention of the German Photographic Society at Stuttgart exhibited very fine samples of their photo-lithographic and photo-zincographic transfer paper, and of prints obtained with it, and to which a medal was awarded, has recently published working details of its process. A transfer paper is wanted with a thin and hard film. It is sensitized in a bath consisting of :—

Potassium bichromate	...	...	...	1 part
Water...	...	...	...	16 parts
Spirit ...	...	...	...	4 „

at a temperature of 66°. The transfer ink should be stout and greasy ; it is as much diluted with poppy-oil,



that it may be easily wiped out with the finger on the inked-in and dry copy. Next

Pulverised Syrian asphalt	...	...	10 parts
Beeswax ...	...	...	1 part
Resin ...	...	...	2½ parts

are melted together, and the mass, after cooling, is pulverised. The transfer ink is now by means of a velvet roller applied to the dry copy until the latter has acquired a middle greyish colour, when it is immersed in clean water, obviating the formation of air-bubbles. After a period of eight to ten minutes it is taken out and placed with the back on a thick plate glass ; then it is covered with blotting-paper, and a clean roller several times passed over it, so as to get the paper as smooth as possible. The half-dry copy is then again worked over with the velvet roller. Gradually the image makes its appearance. When it is to be seen rather distinctly, the ink should be entirely removed from the unexposed parts by gently rubbing over with a soft sponge saturated with water, by a circular motion of the hand. Between clean blotting-paper the copy is next freed from all water, then it is, by means of pins, fixed to a board, and allowed to dry free from dust in a well-ventilated room. The transfer is then dusted-in with the above asphalt powder, the excessive powder being

removed with a pad of clean cotton-wool, when it is, film side down, gently warmed over an alcohol lamp. In this condition the copy can be kept for a long time. It is now slowly drawn through concentrated alum solution, washed out for some minutes, placed between moistened blotting-paper, and finally put on the zinc plate or stone, which has previously been warmed up to 122°. It is now ready to be transferred. This should be effected by beginning with slight pressure, increasing it gradually. The pressure being sufficiently strong, the back of the transfer should be moistened, and the zinc plate again be warmed to 122° ; it is then passed twice through the press, then placed in cold water for a half to one minute, and the transfer paper lifted away. Only slight traces of ink will adhere to the latter. The plate is then ready for the first etching.

## MODERN PHOTOGRAPHIC ENGRAVING AND PRINTING.

BY GEORGE S. WATERLOW.\*

We now have a transcript of the drawing in printing ink on a paper which, as soon as dry, is ready for laying down on a piece of perfectly clean zinc, and passing through a press. The effect and purpose of passing this cleaned sheet of zinc through the

\* Continued from page 156.

\* Continued from page 187.



press in contact with the picture on the gelatine-paper is this: owing to the stronger attraction of the greasy ink for the clean metal than for the gelatine, it leaves its original support, and attaches itself strongly to the zinc, giving a beautifully sharp and clean impression of our original drawing in greasy ink on the surface of the zinc. The zinc plate is next damped and carefully rolled up with a roller charged with more printing ink, and the image is thus made strong enough to resist the first etching. This etching is done in a shallow bath, which is so arranged that it can be rocked to and fro. For the first etching, very weak solution of nitric acid and water is used; the plate is placed with this acid solution in the bath, and steadily rocked for five or ten minutes. The plate is then taken out, washed, and again inked; then it is dusted over with powdered resin, which sticks to the ink on the plate; after this the plate is heated until the ink and resin on the lines melt together and form a strong acid-resisting varnish over all the work. The plate is again put into the acid etching bath and further etched; these operations are repeated five or six times, until the zinc of the unprotected or white part of the picture is etched deep enough to allow the lines to be printed clean in a press, like ordinary type or an engraved wood block. I ought, perhaps, to explain that between each etching the plate is thoroughly inked, and that this ink is melted down the sides of the line, so as to protect the sides as well as the top from the action of the acid; were this neglected, the acid would soon eat out the lines from below. The greatest skill and care is, therefore, necessary in this work, especially so in the case of some of the exquisitely fine blocks which are etched for some art publications.

There are many details which are necessary to successful etching, but those now given will be sufficient to convey generally the method of making the zinc plate for the typographic block. After etching, there only remains the trimming of the zinc, a little touching-up, and mounting it on a block of mahogany of exact thickness to render it type-high, and it is now ready for insertion with type in the printer's forme.

From a properly-etched plate hundreds of thousands of prints may be obtained, or it may be electrotyped or stereotyped and multiplied indefinitely.

The next process on my list is engraving on copper in intaglio. There are many names now in vogue for this beautiful process, but it is best known by that of "photogravure." The difference between an intaglio and relief engraving is implied by their names. In the one we are now to deal with, the lines or ink-carrying parts of the plate are sunk below the surface, instead of being highest, as in the case of relief or type blocks.

The great advantage of this process in point of beauty over that of zinc surface blocks is, that we are able to reproduce a drawing which is made with washes instead of lines, a painting, or a photographic portrait or landscape; but, for commercial and general purposes, it is not so useful as type blocks, because of the expense and slowness of the printing. The ink has to be rubbed into the lines and hollows of the plate, and the surface perfectly cleaned for every impression.

There are many methods of producing these plates by the aid of photography, but details of most of them are either unpublished or are worked as secret processes. I shall, however, be able to indicate the method to you in general terms.

Instead of a negative, a positive on glass is required for the first operation. This positive must contain every gradation of tone in the original, and be as nearly perfect as possible. Next, a solution of gelatine, sensitized with bichromate of potash, and containing a graining matter, is thickly spread over a glass plate and dried; when dry, it is stripped from the glass and placed with the glass positive in a printing frame, and strongly printed. After printing, the film of gelatine is attached to a metal plate and developed with water like a carbon print; when sufficiently developed, the film is allowed to dry. On examination, it will be found that the picture appears in the form of little elevations and depressions over the surface, the blacks being the highest, and the whites almost bare metal—each gradation of tone in the positive being a different elevation in the gelatine. This film may now be brushed over with powdered graphite and placed in the electrotyping bath, and a printing copper-plate produced.

Another method is to sensitize the surface of the copper itself with the same grained bichromatised gelatine, expose it under a positive, and bite through with "perchloride of iron." The etching fluid passes through the parts protected from light by the positive, and etches the copper in exact proportion to the solubility or insolubility of the exposed gelatine surface. This is the simplest of the many processes, and it answers well for a

small number of printings; but it is not deep or strong enough for much hard work.

I now pass to a different photo-mechanical printing—i.e., Woodbury printing.

This ingenious process is, like the others, founded on the peculiar oxidising action of gelatine in the presence of bichromate of potash; the process has now been before the world so long that most will be familiar, if not with the actual process, at least with its production. Great credit is due to the originator of this admirable process, and for the complete and practical issue to which he brought it.

Gelatine with bichromate of potash is spread upon levelled plates of glass, dried, and stripped; the film thus obtained is exposed to light under an ordinary negative; the film is then cemented, face down on glass, and washed for several hours with hot water. After being allowed to dry, the film is again stripped from its support, and presents the appearance of a delicate piece of silk, with an exquisitely-modelled picture in fine relief. Its texture, delicate and fragile as it may appear, possesses extraordinary strength, and in the next operation is subjected to a pressure of hundreds of tons in contact with the hardest steel, and comes out of the ordeal unharmed, and ready to be used again and again without injury. The printing-plate or block is made of hard, rolled lead, and is placed face down on this gelatine film or relief on a steel block in a powerful hydraulic press, where it receives immense pressure—often that of five hundred tons. The raised image on the gelatine is thus forced into the lead plate or block, and gives a mould ready for the special printing it is to receive.

The printing is rather difficult to explain. The lead mould is laid on a plastic cushion on the bed of a small press, and its face brought up almost, but not quite, with a sheet of plate-glass cemented to an iron lid (or platen) hinged on the top of the press; the hinged lid is lifted by the printer, and he pours on the mould warm ink, made of gelatine and colouring matter. A sheet of prepared waterproofed paper is laid on the pool of ink, and the lid shut down and clipped by a lever motion; this spreads out the gelatine ink over the entire mould, squeezes it away from the highest parts, or whites, and leaves it only in the hollows, or dark and toned parts of the picture. In a few minutes the warm layer of ink cools and sets, and on the press being opened, the sheet of paper with the ink from the mould adhering to it is carefully removed. This is the Woodbury print, and now only requires drying and fixing in alum to make it the finished permanent photograph which is so familiar to all.

We now come to collotype printing, and it is perhaps of all methods of photo-mechanical printing the one which lends itself to the greatest variety of effects; every one of the previously-mentioned processes can be closely imitated by it.

It is, above all others, the best process for facsimile reproductions in large numbers, reproducing an engraving a line drawing, a wash drawing, a photograph of nature, or from life, all with equal facility. The principle of the process is, as in the others, founded upon the altered nature of gelatine with bichromate of potash after exposure to light, but in this case differing from those mentioned previously in the fact that the printing begins and ends with the original gelatine surface. It is very simple—a thick sheet of plate glass (sometimes metal is used) generally, but not necessarily, ground on the surface, is first coated with a substratum containing silicate of soda and albumen, 5 to 1, which has a great holding power; when this coating is dry, the surface is recoated with a solution of gelatine and bichromate of potash, and dried quickly in a hot, dark room or chest. The plate is now ready for exposure under a negative (either a collotype or ordinary dry plate), which must be reversed. After proper exposure, according to the density of the negative, the plate is thoroughly washed in water and dried; only a faint trace of the image or picture can be seen on the plate at this stage. It is now placed in a printing press (generally lithographic) damped with water, and a leather roller charged with printing ink passed carefully over the plate.

Now is seen most clearly the curious and interesting action of light upon the prepared gelatine—the gelatinous surface receives the printing ink from the roller in exact proportion to the amount of light that has passed through the different parts of the negative—i.e., where there are blacks in the picture the plate inks up solid; where white, it will take no ink at all; and where half-tones exist, it takes ink in the same gradation all over the plate. It only remains now for the printer to lay a sheet of printing-paper, smooth or rough, upon the plate, and to pass it through the press. The result will



be a collotype print. One can also print excellent copies of any subject upon calico, linen, satin, and other fabrics. A good plate will give 400 to 500 copies, sometimes 1,000. Any colour of ink may be used, and any paper. The prints may be varnished and mounted like ordinary photographs, or they can be printed on paper with white margins, like an engraving.

### THE DAGUERRETYPE PROCESS.

We received the following note a few days ago from one of the editors of a leading monthly magazine in our city:—

"Is the art of the Daguerreotype extinct? If not, is there a practitioner of the art in New York? It ought to be revived, and you would do me and the public a service by putting a line in your journal of photography on this topic. Looking back over the beautiful Daguerreotypes in my family archives, I wonder at the desuetude of the art."

Such inquiries are not infrequent. As people become interested in photography, collections of pictures are made, and old Daguerreotypes come in for their just share of admiration. Truly, photography never created anything more lovely than a Daguerreotype. But pictures more easily made drove the Daguerreotype out of the line, and but few are made in these times. There is no difficulty in the way of making them, however. The Scovill Manufacturing Co. still have the plates in stock, and, since we made them in our first love for the art, we are prepared to instruct in the processes, if there is a demand for the information. Pending the growth of interest in the matter, we give below a brief summary of the Daguerreotype process.

The metallic, silvered plates being secured, they must be thoroughly and skilfully polished. Powdered pumice-stone, Canton flannel, a little alcohol, and a "buffer" are the working tools. The buffer is of two kinds. The first is known as the hand-buffer (fig 1). It is conducive to muscular development in

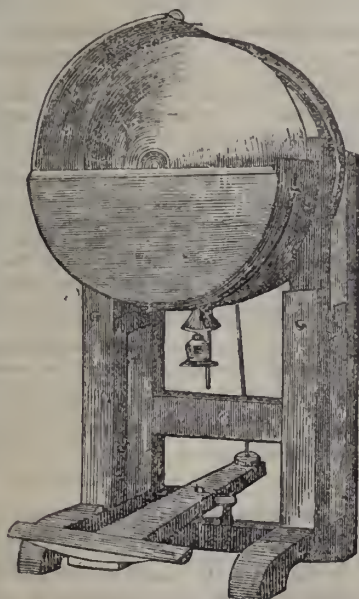
FIG. 1.



The Hand-Buffer.

all weathers, and productive of violent perspiration and non-success in hot weather. The easier method of buffing is performed with the buffing wheel (fig. 2). Instead of applying

FIG. 2.

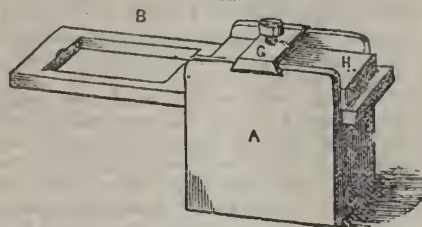


The Buffing Wheel.

the surface of the buff to the plate, as in the first instance, the plate is applied to the cone or convex surface of the buffer, when the wheel is used. In either case, strength and skill are required.

When well polished the plate is placed in a "coating box" or sensitising box (fig. 3). In this the plate is subjected to the

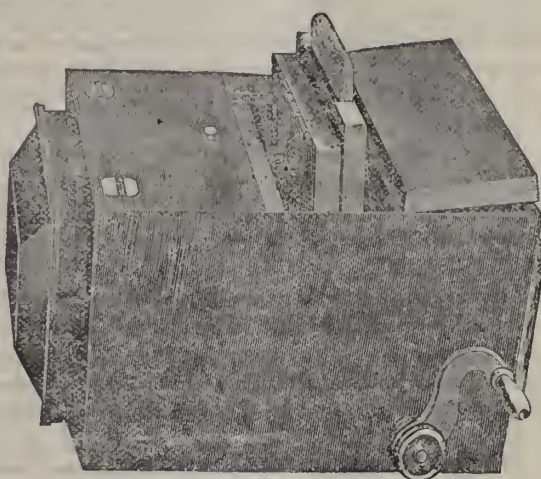
FIG. 3.



A Coating Box.

vapours of iodine, &c., and becomes sensitive to light. The wooden box, A, is supplied with a stout glass jar with a clamp cover, G H. The plate is put into the holder, B, slid into place over the jar, and the process goes on. At the proper time the plate is removed and exposed in the camera (fig. 4).

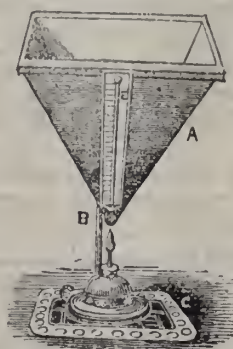
FIG. 4.



The Camera.

The picture is developed by a process known as mercurializing. The plate is subjected to the action of heated mercury by means of what is known as the mercury bath (fig. 5). Highly purified

FIG. 5.



The Mercury Bath.

mercury placed in this bath is heated to, say, 80°, and then the plate is subjected to its action until the image is "out." Experience teaches the time required for this operation.

The imposing appearance of the apparatus used in Daguerreotype days may be judged by comparing the camera used then with the feather-weight of to-day. All such things may be seen in Prof. Chandler's Photographic Museum (free to the public) at the School of Mines, Columbia College, Forty-ninth Street, and Fourth Avenue, New York.—*Philadelphia Photographer*.



## Notes.

"I had my portrait taken by electricity the other day," said a lady, recently. "You mean by the electric light," replied the person to whom she was talking. "Well, yes, I suppose so, although I saw no light. It was wonderful how quickly it was done. The photographer said to me, 'Don't trouble about having your portrait taken. Go on talking, and I will look after the rest.' And then he squeezed something in his hand looking like an india-rubber ball, which I expect turned on the electricity. There was a little click and it was all over. It is such an improvement on the old style of things, isn't it?"

Scarborough has set an example which, no doubt, will be followed by other places of resort. It has determined to lay a rate of a halfpenny in the pound in order to furnish a fund for proclaiming its beauties through the medium of pictorial advertisements. We presume that the term "pictorial advertisements" includes photographs. The Great Eastern Railway, as we noticed some time ago, has in its main line carriages, frames of photographs of the various watering-places on the east coast, and this seems to us, if not a better mode of advertising than the highly-coloured—highly coloured in more senses than one—poster, at all events, a valuable adjunct. But there are other ways in which photographs might be made useful. Waiting-rooms at railway stations are usually the most dreary places in the world. When you have exhausted the texts on the walls, there is nothing left but vacant gazing into space. Albums, of a non-portable size, to put them out of the temptation of the dishonest, containing photographs of various places of interest, would, we fancy, not only serve to beguile the weary hours, but also answer the purpose of an effective advertisement. We commend the idea to the Scarborough Town Council.

The wide popularisation of photography in the present day has often been commented upon, and perhaps one of the most notable illustrations of this is afforded by the circumstance that a series of papers on practical amateur photography is announced as forthcoming in the great Irish agricultural paper, the *Weekly Freeman*.

The series is to commence in the issue of to-morrow week, April 7th. Regarding it the *Freeman* says:—"So great an interest is now taken in the Art, that amateur photography is predominant amongst instructive pastimes. These the papers will facilitate and guide."

We have often referred to the extent to which the illustration of ordinary newspapers is becoming general, and as an instance of this, we may refer to the *Freeman* of last week as having no less than twenty-four illustrative cuts in the text, in addition to the coloured cartoon ordinarily issued with the paper: and all this for three half-pence.

The Convention of the Photographic Association of America about to be held in Minneapolis boasts of an attraction which was wholly wanting both in the Glasgow

Conference and in the Conference just concluded of the Camera Club. The committee sent to Minneapolis to make the necessary arrangements, in its report, says, after enumerating various items in the way of excursions, &c., "a stenographer has been secured who is a real blonde with dark hazel eyes and finely-formed head, who seems to have fully her own share of the surplus energy so much talked about in Minneapolis." There must be something more here than meets the eye. We are, unfortunately, left in doubt whether it is intended as a warning to the members not to make their speeches too long out of consideration to the lady stenographer, or as an intimation that no matter how much they say, the "surplus energy" of the lady will be fully equal to the occasion.

W. J. Stillman has been recounting his experience of photography on board ship. Desirous of securing one of the Atlantic big waves, he was held firmly on the poop by the captain and another officer, so as to keep him steady. The task was a difficult one, because it was necessary to secure the wave at the time when there was an outburst of sun. The two things refused to be coincident, and Mr. Stillman was becoming weary when the captain roared out, "Now then!" The exposure was made, and almost at the same instant the three were deluged with water; but a fair picture was obtained. The incident reminds one of the story told of Turner, who, to study the sea in a storm for one of his pictures, had himself lashed to the mast of the ship.

It is curious that the tailors, or whoever the persons may be who prepare fashion plates for gentlemen, have not thought of employing photography for the edification of their customers. Nothing can be more unlike nature than the figures who are represented wearing coats of immaculate fit, and trousers irreproachable and impossible in their freedom from bagginess. When you choose a suit of clothes from the appearance they present on one of these paragons, the result is always unsatisfactory, because reality falls so far short of the ideal. According to the *Daily News*, tailors' foremen are the best dressed men in London, and the amount of money they have to spend in order to live up to their position is so great that a pension fund exists for their benefit, upon which they can draw when their symmetry of waist disappears, and they can no longer pose as models of fashion. Here, it seems to us, is the material for the tailors' plate of the future. If these gentlemen were photographed we should then know how the cut of a coat really looks; at present it is merely guess-work.

It may be mentioned that one enterprising tailor, whose speciality is knickerbockers and breeches, has already taken up the idea, but in an obverse sense. He points the moral of wearing badly-made nether garments by exhibiting a couple of photographs—a back and front view—of a gentleman arrayed in a pair of terribly baggy inexpressibles. Of course this is much easier to obtain than the photograph of the perfectly fitting attire;



still, it shows that the thoughts of the sartorial profession are turned towards the possibilities of photography.

A boon has been conferred by photography upon mankind. To see the best copy of the Aphrodite of Praxelites without her tin clothes on as she appears in the Vatican—we speak on the authority of the *Daily News*—has long been the desire of the artistic world. But this, owing to the extreme modesty of the Cardinals, has hitherto been impossible. Mr. Peiry, it appears, has managed to secure a cast of the Aphrodite without the tin drapery, and two photographs from the cast are published in the journal of the Hellenic Society. We quite agree with our contemporary, that it is a comfort she can now be better seen, nearer home, than in the palace of the Popes.

According to Janssen, photography is the means by which meteorology will become an exact science. In a paper communicated to the Société du Géographie, he gives an interesting account of a visit to the meteorological and astronomical observatory on the Pic du Midi in the Pyrenees. Here he took several photographs at different times of the day, each photograph recording some meteorological phenomena to which the elevated portion of the observatory lent itself admirably for observing. He is strongly of opinion that an observatory for photography should be established at Simla, in the Himalayas. He contends that meteorology—hitherto only partially studied, sometimes by astronomers, sometimes by doctors, sometimes by travellers—is entitled to be studied by itself as an absolute, separate science, and he recommends to this end the employment of photography, because, with its assistance, this science will be most rapidly advanced. Perhaps the English meteorological department will take note of M. Janssen's suggestion.

## EXPERIMENTS IN ACTINOMETRY.

BY D. WINSTANLEY.

On p. 114 I said I had found considerable difficulty in the comparison of photometric tints in consequence of my failure to get a steady and brilliant sodium flame, and I appealed to Captain Abney, or any other experimentalist having had much experience of the light in question, for assistance in the shape of information as to its efficient mode of management. Thus far my appeal remains without response. I find, as a matter of fact, that I can obtain more constant readings by a naked gas flame than with the sodium light; and I begin to doubt that the whole theory of the sodium flame is other than a theory of error, so far as actinometrical measurements by it are concerned. That colours are annihilated by it, and all tints reduced to the tones of grey, does not seem to me to prove its value. I am not aware of any evidence that that amount of redness in a red print which gives the same amount of greyness as a certain depth of coldness in a print of another colour when seen by the sodium flame, does really correspond with an equal quantity of actinic action, and to me it is very difficult to devise experiments which shall definitely prove that this is so, or that it is not. In any case, there can be no doubt as to the desirability of using for actinometric purposes such means as will yield prints which do not differ materially in their

colour. An actinometrical strip should not be prepared in bright sunshine if it is intended to be used for indicating the value of tints which have been printed in the shade. With tints of the same colour, probably almost any sort of bright and steady light will answer for the comparison of their tones. The sodium flame in my hands flickers too much for anything, and when bright at the commencement of an experiment, fades down too rapidly to admit of satisfactory comparisons being made. I have found, when making comparisons by ordinary gaslight, that, with one eye closed, they are more effectual than when both are used. The eye gradually becomes wearied and insensitive to colour, whilst still sensitive to tone; and hence, in this way, very fair comparisons can be made.

Here are some of the results obtained by comparing a strip produced in the square of the distance actinometer (p. 56) with one obtained by the rotary cylinder apparatus described and depicted at an earlier date (p. 34).

Square of the Distance Instrument.			The Rotating Cylinder.	
Tint No.	1	(the darkest) ...	Too deep for comparison.	
"	2	... ..	A little more than 10	
"	3	... ..	Equal to 10	
"	4	... ..	"	7.7
"	5	... ..	"	6.3
"	6	... ..	"	5.7
"	7	... ..	"	4.2
"	8	... ..	"	3.5
"	9	... ..	Not capable of being compared.	
"	10	... ..		

The actual depths of the cells in the somewhat rude square of the distance instrument are as under:—

No. 1	(see page 56)	... ..	1.10 inch
"	2	... ..	1.30 "
"	3	... ..	1.50 "
"	4	... ..	1.72 "
"	5	... ..	1.92 "
"	6	... ..	2.13 "
"	7	... ..	2.35 "
"	8	... ..	2.56 "
"	9	... ..	2.80 "
"	10	... ..	3.05 "

Here below we have the amount of light theoretically received at the bottom of each cell, and the amount of tint actually obtained in the first of a number of experimental strips.

Cell No.	Calculated Light.		Quantity of Light as shown by tint obtained.	
1	...	...	...	—
2	...	...	...	—
3	...	10.0	...	10.0
4	...	7.6	...	7.7
5	...	6.1	...	6.3
6	...	4.9	...	5.7
7	...	4.0	...	4.2
8	...	3.4	...	3.5
9	...	—	...	—
10	...	—	...	—

The above results follow fairly well upon the theory on which the instruments are based; and so do these, which are a record of experiment No. 2.

No. of Cell.	Calculated Light.		Value of Tint obtained.	
1 to 5	...	—	Too dark for purposes of comparison	
6	...	10.0	...	10.0
7	...	8.2	...	8.3
8	...	6.9	...	6.7
9	...	5.7	...	5.7
10	...	4.8	...	4.6

Later results, however, have been variable, and for reasons which, thus far, I have not ascertained.

My experiments are proceeding still.



## THE PRESENT VALUE OF ART IN PHOTOGRAPHY.

BY J. F. MOSTYN CLARKE.\*

PHOTOGRAPHY has increased so enormously of late years that I believe it true to say no home exists in the kingdom, rich or poor, but has beneath its roof a photograph of some kind.

Let us consider what this signifies. It is this: in every household a means, be it ever so small, of appealing through the eyes to the higher instincts of the human being; of touching through the natural affections the tenderest feelings of the human heart; or, should the picture be a landscape, by leading the mind to some quiet spot of God's nature; of shedding a spirit of peace over the soul, freeing it awhile from the narrowness of the every-day world, and raising it with thoughts that are the truest, purest, and most beneficial worship of the Creator Himself.

What power have we, who are able through our circumstances, to give thought and time to this our art science? How much might we not do for our poorer brethren by instilling into photography a spirit of pure art, by raising in them a mere reflection even of some of the thoughts and feelings experienced by ourselves, when contemplating nature, or the thoughts and works of the great artist? Alas! I have no space to treat of the effect of art upon the human temperament. I may only say enough to show that the power lies in all branches of pictorial art.

It is my opinion—I grieve to say it—that photography, as at present practised, has a very slight art value, such value as it does possess lying among a very small number of the chief professional men, and among amateurs the latter portion of merit being more or less in landscape work; and yet it is my hope some day to see this changed, to see the simplest picture possess at least the merit of correct art—that is to say, as far as the mere mechanical rules are concerned.

Suppose we were to pass through the streets of London as strangers, almost the first thing to catch our attention would be the show-case outside some photographer's studio; at a short distance it appears to be a collection of pretty pictures, and we are filled with delight. Approaching near, the dream is dispelled; it was but distance that lent enchantment to the view. Here is a head carefully vignettied, a clear, good photograph, well finished, save, perhaps, that it has been made unnatural through excessive retouching; there has been no figure to pose, hence composition faults are at their minimum, and, excepting a slight stiffness, the whole is very pleasing.

Here again is a figure standing by a chair—a full-length figure; the picture is good, but something in it makes it unpleasant to the eye. A few moments' consideration, and we realize that the complete figure is placed wrongly in the picture, the space on either side wrongly apportioned, the line of the chair in composition out of harmony with the chief subject adding to the annoyance caused by the other faults.

Then again we find many a picture of a lady half reclining, half sitting upon a sofa, where the lady herself is but an accessory, the sofa being so crudely introduced, and its lines so inharmoniously compared with those of the subject, that it becomes the centre of attraction, and forces itself upon the eye to the exclusion of the chief object.

There is composition as to lines. For light and shade we generally should find a better state of things, although we rarely see what may be felt and known as a beautiful arrangement, and that draws and keeps our attention fixed. I have no space here, neither would the time be suitable, to attempt a lecture on composition, and light and shade, nor do I presume to teach. I desire rather to tell you what I would wish to see, what I would have learned.

Photographers as a class cannot progress, neither can their art thrive, by mere technical excellence; that is but a minor detail, though a necessary and very important one. Could the higher arts thrive or be anything with mere excellence in the technicality of colouring? You will all say no! and I reply, neither can our art thrive—I had almost said live—without a vast deal more than technical excellence. The picture is the main, the most important thing, and without a true knowledge of the laws of art there can be no picture worthy of the name. Here and there we find work showing that love and tenderness for what is complete and beautiful, from which a deeper knowledge of art so readily springs, but I fear it is only here and there.

How constantly, on the other hand, does one turn away disgusted from pictures, without one jot of feeling; from portraits

in which the different parts of the figure expressing their attitudes, thoughts, and ideas that are at variance?

I would see that knowledge everywhere. I would see such a state of things that when a man or woman asked for a photograph they received a picture—a picture only in light and shadow—but still a picture as to composition, and complete as a whole.

Have we not art schools? Have we not collections where every one whose path in life is upon the high road of pictorial art may study, and so bring complete knowledge to bear upon their work? It is as easy and as profitable to produce what is correct and beautiful, as to manufacture what is bad. The process (in photography, at least) is just as cheap.

The public—I do not deny it—are satisfied with what they now receive because they cannot judge, and because they only wish for a recollection from life of places and people dear to them; and also because "it is only a photograph."

Should the painter's art stand still (and standing still is recession), because the public are ready and willing to buy the thousands of bad pictures exhibited yearly in our exhibitions? Do not the leaders in the painters' world work on and win authority renowned, and so teach what is right from the place they have won? Do not our galleries of masters' work live as standards which none dare dispute? And why should not we, in our lowly branch of art, have our standards, our ideals? I have looked abroad in vain, I have hoped in vain; but I can find no soul, no ideal in photography. Every man does as he thinks right, obeys no or few laws, works to no standards.

I have fancied that a dawn of better things was breaking, or about to break, and I hope still.

There is a movement among amateurs to raise standards; let them study, let them strive and labour, and so make the science that has well-nigh reached perfection to be a vehicle of true art; and let us realise what this means. When we think how easily obtainable are photographs by all ranks and classes, and how widespread is their circulation, we can then see how important a thing it is that every photograph be pictorially valuable.

## LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTION.

BY CHAPMAN JONES.

CHAPTER XXI.—THE USE OF CHROMATED GELATINE IN PHOTO-LITHOGRAPHY AND PHOTO-ZINCOGRAPHY, IN COLLOTYPE, IN GETTING GELATINE RELIEFS, IN WOOD-BURYPE, AND IN CARBON PRINTING—REVERSED NEGATIVES—THE CONTINUING ACTION OF LIGHT.

Chromic acid, in combination with potash as potassium bichromate, or with ammonia to form the corresponding ammonium salt, has many photographic uses founded upon the change produced by light when it is mixed with certain organic substances.

Gelatine is the organic substance most generally serviceable in this connection. If a film of gelatine is sensitized by treating it with a solution of the dichromate, and exposed under a negative, those parts of the film to which the light gains access will be rendered insoluble in water. The chromium salt loses oxygen, which is probably taken up by the gelatine, and the chromium compound produced makes the gelatine insoluble. We know that chrome alum is one of the most active reagents in giving gelatine the power to resist water, and the action of light upon the bichromate changes a part of its chromium into the same chemical condition in which the metal exists in chrome alum. But at the same time that the gelatine is made insoluble, its property of absorbing water and swelling is very much reduced; and it may be stated generally that in proportion as the gelatine is made to resist the action of water, it is enabled to take up or retain greasy matter upon its surface. As ordinary printing inks are greasy, this is a most important property of the exposed chromated gelatine.

If a gelatinic film, which may be supported on paper, is sensitized, exposed under a negative, and coated with an even layer of greasy ink in any convenient way, it only remains to treat the film with cold water to swell it, and

\* A Communication to the Camera Club Conference.



then with warm water to dissolve away the gelatine not made insoluble by light and so to carry away mechanically the ink resting on the soluble parts, to obtain a print from the negative in greasy ink. If the ink used is suitable for the purpose, the print may be transferred in the usual manner to a lithographic stone or zinc plate, and printed by the ordinary lithographic process. These are the principles of photo-lithography and photo-zincography.

By varying the process in a few practical details, a gelatine film may be printed from itself, for the ink will "take" on those parts of the film that have by exposure lost the power of absorbing water, and will be resisted by those parts of the film that are unchanged. The printing is very similar to lithographic printing, but a vertical pressure is preferred to the scraping pressure of a lithographic press, on account of the comparative tenderness of the gelatine surface. This is the essence of the collotype or heliotype processes.

By taking advantage of the insolubility of the sensitized gelatine when exposed to light, and the fact that the insolubility will penetrate to a greater depth the longer the light acts or the more powerful the light may be, it is possible to get a relief picture from any negative where the light and shade of the original are represented by a proportional amount of relief, the darkest part of the original being represented in highest relief. This gelatine relief, when dry, can be made to give an intaglio or sunk image in a soft metal by simple pressure, or by using an easily fusible substance a cast of it may be taken. The intaglio in metal may be made to reproduce any number of coloured gelatine reliefs by pouring the melted gelatine upon it, and pressing the flat surface that is to receive the relief into contact with the mould until the gelatine is set. The thickness of the layer of coloured gelatine determines the amount of colour, and as the colours used are more or less transparent, the thicker the layer of colour is, the deeper is the tint. These are the principles of the Woodburytype processes, and the final pigmented gelatine relief, when dry, exhibits so small an amount of relief as to be scarcely noticeable, especially when finished in the ordinary way. A Woodburytype print is, therefore, a pigmented gelatine relief in which the thickness of the relief determines the amount of colour, and, therefore, the depths of tone of any part of the print.

In ordinary "carbon-printing," as it is called, or printing in pigmented gelatine, the final picture is quite analogous to the Woodburytype print, but, instead of being cast in a mould, it is produced directly by the action of light upon a sensitive gelatine film. The more transparent any part of the negative is, the deeper will the light be able to penetrate through it into the film, and, therefore, the greater the thickness of the film that will be made insoluble. In the Woodburytype process it is difficult to get a white part of any appreciable extent unstained; while in carbon printing there is no analogous difficulty, because the gelatine that remains soluble after the exposure is dissolved and washed away. In the first case the process is mechanical, and every print from the metal relief is alike if proper care is taken; but in the second process very considerable variations may be made, according to the taste and skill of the printer, because the solubility of the exposed gelatine film is a comparative matter depending upon the temperature of the water used, and the time it is allowed to act.

The film of gelatine used in carbon printing is called "carbon tissue," and it is supported on paper for the sake of convenience. The gelatine is generally mixed with small quantities of soap or sugar, or similar substances, to make the working with it more easy and certain, and it is usual to add enough carbolic acid to prevent its going mouldy, in addition to the bichromate of potassium. The pigments used are various, but they ought always to be unchangeable by exposure to light, and it is necessary to avoid any colouring matter that would react with the gelatine to make it insoluble, or that would be injuriously affected by hot water or weak alum solu-

tion. The colour should be finely ground, and the gelatine mixture must be very carefully made uniform. If the coated paper is kept for a short time in a horizontal position before the gelatine has set, the coarser particles of pigment settle down more or less; and there is advantage in this, because the upper surface of the gelatine, which gives the details in the lights, has the finer pigment and is therefore more delicate; while the shadows showing the coarser particles have, perhaps, a slight appearance of granulation that tends to give them transparency.

When the carbon tissue is exposed to light under a negative, the insoluble condition brought about by the action of light penetrates to a greater or less depth according to the transparency of the negative. The thickness of the layer of pigmented gelatine must be such that the effect of the light never quite penetrates it to produce even the darkest shadow in the finished picture. As the insoluble parts of the gelatine are on the face of the film, it is necessary to secure the face of the exposed tissue to some support before the soluble parts are washed away. When the picture remains upon this support the operation is called printing by single transfer, and this is the simplest way of producing a carbon (or pigment) picture. But the result of this one transfer is to turn the picture round and show the object as if it were viewed in a looking glass—the picture is "reversed." To get a non-reversed picture it is necessary to get another reversal, which shall turn the picture round a second time, so to speak, and bring it back to its proper relationship to the object.

This second reversal can be done in two ways. If many prints are wanted, it is certainly better to effect the change once for all by making a reversed negative; while, if only a few prints are to be made, it will generally be more economical to reverse each print as in the method technically called "double transfer." In printing by double transfer, the exposed tissue is mounted on a temporary support, and transferred from this to its final support.

Although these transferrings are not difficult to effect, now that the process of carbon printing has attained to so great a degree of perfection, there is at each transferring a tendency to lose some of the most delicate parts of the picture; and, therefore, the method of single transfer is always to be preferred when perfection in the finished result is the only aim of the printer. One perhaps gets nearer to a perfect transferring by coating the exposed tissue with collodion before laying it down upon its support for development, but the degrees of perfection attainable by these variations are so little removed from one another, that even an acute observer, if unacquainted with the technicalities of the process, would probably be unable to find any superiority in the prints done by the more theoretically perfect methods.

The getting of a reversed negative by using a mirror placed in front of the lens at an angle of 45° with its axis has already been referred to. But these mirrors, having a silver surface, soon tarnish; they require careful cleaning to keep them in good order, and sometimes needs resilvering after a year or so. If, therefore, a reversed negative is wanted only occasionally, it is more practicable to resort to other means, though they may be less perfect.

A reversed negative may be obtained at once by putting the sensitive plate with its glass side towards the lens. It is necessary to take care that the glass side is quite clean, that the film is protected from injury by the spring or separating sheet of the camera back, and that, in focussing, the thickness of the glass is allowed for. This last is the most uncertain item in the work; and though it may be neglected when a small stop is used in the lens, and will sometimes even improve the outdoor work of an inexperienced operator by putting the foreground into better focus, it is a matter that needs careful attention in exact work.



It is easy to get a reversed negative if an enlargement is to be made, by using the camera for the production of the negative, and placing the transparency with its glass side towards the lens. If a full-size transparency is made, and this is copied in the way described, the flaws in the glass will not be enlarged.

Film or paper-supported negatives, that are thin enough, may be printed from either side, and the difficulty of reversal disappears; but it is necessary to bear in mind that some of this class of negatives are not thin enough for this purpose. However thin the film negative is, there is likely to be a loss of definition in the print by printing from it in the reverse direction, and whether this loss is harmful or not is easily ascertained by taking a silver print from each side of the negative and comparing them.

In all these processes in which a bichromate and gelatine are exposed to light, it is found that the changes set up by the light, when once fairly started, will continue in the dark. In using such a process, therefore, it is necessary to proceed very shortly after the exposure is finished; or, if the exposed film has to wait a few hours, the exposure should be reduced to allow of this continuing action. By taking advantage of this phenomenon, carbon printing may be expedited by giving every piece of tissue only one-half or one-quarter, or even one-eighth of the full exposure, and allowing sufficient time to compensate for the short exposure before proceeding to development. This continuing action is not exceptional—it is shown in even a more marked way by chloride of gold; and, on the other hand, it is not the rule, for paper soaked in a solution of a uranium salt gives a vigorous image after exposure if treated with red prussiate of potash, but the effect of exposure is very markedly lessened by keeping the paper for an hour or two, and eventually dies away.

In concluding these chapters a word of explanation, if not of apology, is due to those who have read through them connectedly, that many important processes have been scarcely mentioned, and others quite omitted. There was need for considerable condensation and curtailment, and the writer has endeavoured to shorten or omit chiefly those matters that have been often dealt with before.

## Reviews.

**THE PRACTICAL INDEX OF PHOTOGRAPHIC EXPOSURE.** With an Appendix as to Sensitometer Numbers and Rapidity of Plates. Price not stated. By A. R. Wornald, Sutton, Surrey. (Published by the Author, and sold by all photographic dealers.)

In the "Practical Index" we have a convenient pocket note-book for the photographer, in which is summarised our knowledge as to circumstances bearing upon the exposure.

**THE CYCLISTS' TOURING CLUB HANDBOOK AND GUIDE FOR 1888.** Price one shilling. (London: E. R. Ship-ton, 139 and 140, Fleet Street, E.C.)

"Nothing startling is embodied in the twelfth edition of the handbook," says the editor in his preface; but the work retains all the excellent features of the previous issues, with such additions and modifications as the editor has considered desirable. Every cyclist should obtain it.

## Patent Intelligence.

### Applications for Letters Patent.

4,112. JEAN JOSEPH LEON GUYARD, 47, Lincoln's Inn Fields, London, for "Improvements in photographic apparatus."—March 16, 1888.

4,128. JOHN MACINTOSH, 96, Buchanan Street, Glasgow, for "A new or improved process or mode and means of producing photographic prints of designs for Christmas cards, memorial cards, and other ornamental cards of similar nature."—March 17, 1888.

4,145. SAMUEL WHITE ROUGH, 180, Strand, for "Improvements in plate lifting apparatus for working metal sheaths under a bag in connection with detective and other cameras."—March 17, 1888.

4,180. SIMON DELICATE, 12, Cherry Street, Birmingham, for "Improvements in the construction of dark slides for photography."—March 19, 1888.

4,248. FRANCIS NOWLAN, 17, Soho Square, London, for "Improving the form of camera for obtaining photographs of moving and other objects, which he calls 'The Mitrailieuse camera.'"—March 20, 1888.

**Patent on which the Tenth Year's Renewal Fee has been Paid.**

1,097 of 1878. J. W. T. CADETT.—Pneumatic arrangements for photography.

### Specifications Published.

4,808. CHARLES SANDS and JOHN JAMES HUNTER, 20, Cranbourn Street, Leicester Square, W.C., Photographic Apparatus Manufacturers and Dealers, for "Regulating and fixing the horizontal or vertical swing of photographic cameras."—Dated 31st March, 1887.

A circular or other shaped piece of brass or other material with a half circular slot near edge, and having a small knob handle for moving same. This is fixed on to a plate which is fastened on to the main body of camera by means of screw or rivet. Cut in this under plate is another slot; upon the swing part of camera is a plate with projecting pin which is arranged in such a manner as to pass through the two slots previously mentioned. Pressing the knob on circular plate either backwards or forwards enables you to open or close the swing at will, and at end of the projecting pin on the swing part of camera is a small screw knob for the purpose of clamping the two plates in any position required. One of each of these circular plates requires to be placed on each side of the camera.

## Correspondence.

### DIFFUSION OF FOCUS.

SIR,—As a letter from Mr. Chapman Jones in your last issue is calculated, if allowed to go unchallenged, to confirm photographers in an old standing fallacy into which many of them have been led, it is desirable to go into the matter.

In the first place, the expression "diffusion of focus" is itself delusive and misleading. When, some twenty-one years ago, the late Mr. J. H. Dallmeyer arranged the fittings of a portrait lens so that its correction for spherical aberration could readily be partly neutralised, he claimed that by sacrificing definition at the focus, better definition was obtained in the out-of-focus planes. This is just what the words "diffusion of focus" imply, and if there had been any foundation for the claim so made, the term would have been a very proper one. It was, however, shown by the late T. Grubb,\* in a paper and diagram well worth the study of any one interested in the question, that so far from this being the case, the definition in the out-of-focus planes was injured at the same time that the focal sharpness itself was destroyed. Confusion of focus, partial destruction or deterioration of focus, would be more correct expressions to use than "diffusion of focus."

With regard to the authorities cited by Mr. Jones, the quotation from Professor Petzval comes from a paper† describing a lens the back combination of which was, as with the lens subsequently brought out by Mr. Dallmeyer, made adjustable, so as to allow of a certain amount of spherical aberration. With Petzval's lens, however, the special claim made was that flatness of field was thus obtained when perfect focal definition was sacrificed, and this is a

\* *British Journal of Photography*, Feb. 8th, 1867.

† *Journal of the Photographic Society*, Mar. 5th, 1859.



quality for which, as I have repeatedly urged, it is sometimes well worth while to make such a sacrifice. Petzval, however, in the same paper, speaks of the expression "depth of focus" as "a remarkable instance of how every day life—in spite of the strict logic of science—can falsify by its overwhelming omnipotence, the notions of science, and form its own language, a peculiar sort of technicality or 'jargon'—fit only to darken the intellect of the artisan."

Of the other authorities cited by Mr. Jones, perhaps the most striking case is that put by Lake Price, who speaks of the lens as "increasing the depth of perfect focus." It was natural that he and other photographers, having been told that the lens possessed this power, and having felt such a quality as a desideratum, should speak in praise of it; but the claim has been shown to be unfounded, and, indeed, may be taken to be abandoned by Mr. J. H. Dallmeyer himself, when in a recent paper he calls it absurd to speak of some lenses having more depth of focus than others. Although Mr. Jones guards himself to some extent later on, by saying of his "authorities," "We are not bound to accept the views expressed in their literal fulness," I think that if he recognises that the particular statement quoted from Lake Price was a mistaken one, it would have been more candid to say so.

What I am anxious for photographers to recognise is, that they do not, as they have been led to believe, obtain greater distinctness in the out-of-focus planes by sacrificing sharpness at the focus itself. If knowing this they think it desirable to dim sharpness throughout, this is a point for their own taste and feeling.

W. E. DEBENHAM.

#### A FIRST-CLASS OPERATOR.

SIR,—I beg to thank Mr. Brangwin Barnes for the upright and manly way in which he maintains the position of a first-class operator. I have been a first-class operator over twenty years, and have only had to change my employ some twice or thrice during that time. Being at present out of employment, it has greatly perplexed me how to advertise myself, as, judging from what we come across in print in the weekly journals nowadays, first-class operator may mean anything you like. Now I think every operator should maintain the integrity of his profession, not only for his own benefit, but that of his fellow-craftsmen. It is a pretty well-known fact that we experience some very queer treatment from unprincipled employers sometimes. I don't claim infallibility, human perfection not yet having been attained; yet I can say there are first-class operators in the true sense of the term, who never get the chance of appreciation. I might say a good deal in reference to the very great apathy and indifference existing amongst first-class operators to their societies' meetings. I have pretty regularly attended them for a number of years, and to meet or come across a fellow operator has been, indeed, a rarity. Apologising for thus troubling you, yours truly, H. D. ATKINSON.

#### AN EASY PRINTING PROCESS.

SIR,—In continuance of my letter in your last week's journal, I now give the details of a method of stripping gelatine negatives, and putting them into a convenient form for either silver, carbon, or any of the mechanical methods of photographic printing.

The materials required will be as follows:—A small quantity of fluoric acid, some thick transfer collodion, a 20 per cent. solution of white gelatine (any of the ordinary dry plate gelatines will answer), a dish of either ebonite, lead, or gutta-percha for the fluoric acid solution, some levelling stands, porcelain dishes, &c.

If the negative happens to be varnished, the varnish must be removed with methylated spirit, care being taken to entirely get rid of it, otherwise it will form a hindrance in subsequent operations.

The negative, being in an unvarnished condition, is placed upon a levelled stand, and a pool of thick transfer collodion poured upon it. This is allowed to flow to the corners, but this is not poured off. When the collodion is thoroughly set, which will take ten to fifteen minutes, the negative is placed in a dish of water to wash away the ether and alcohol. Whilst this is in progress, place in the ebonite, lead, or gutta-percha tray a solution of fluoric acid in the proportion of one dram of acid to ten ounces of water, and transfer the negative to this bath; in a few minutes the corners will show signs of being loosened, and begin to float up. When this arrives, take out the negative, and wash carefully with plenty of water. Now put it face uppermost on a pad of blotting-paper, place upon the film a piece of smooth writing-paper thoroughly wetted and a little larger than the negative, and get it into contact by a gentle action of a squeegee; now turn it over glass side uppermost, and raising the plate slightly turn down a corner of the paper, and the film will probably come with it; should it not do so, a gentle touch with the finger-nail will put it into contact, and enable the entire film to be stripped from the glass.

The film disengaged from its original glass, held together by a film of collodion, now rests upon a temporary support of paper. The next operation is to get it down upon a combined film of gelatine and collodion made as follows. Clean some glasses, any size, but a little larger than the negatives to be transferred to them, and rub one side over with French chalk, polishing it off well; coat the glasses with transfer collodion, and when set wash out the solvents of the collodion in a dish of cold water. When this is accomplished, stand the plates up to drain for five minutes, then place on a levelled stand, and pour upon the moist surface a quantity of a 20 per cent. solution of white hard gelatine, allow to set, and finally rear up to dry in a moderately warm room. These plates can be prepared at any time, and should always be on hand for use when wanted.

To complete the operation of transferring the negative film now floating about in water, immerse one of these prepared gelatine plates in a tray of clean cold water, and transfer to it the negative film (which should not have been allowed to dry), bring the two surfaces together under water and lift out, get them into perfect contact by a gentle use of the squeegee, take off the supporting paper, and allow the transferred film to dry; when dry cut round the edges, and the negative may be stripped from the glass as a film, both sides protected by collodion, convenient to handle, and capable of being printed from either side with equally good results. The film, being enclosed between two surfaces of collodion, is not likely to be affected by moisture, will keep quite flat, and be readily available at any time.

It occasionally happens that a valuable dry plate negative meets with an accident and gets cracked; very frequently it is only the glass that is broken; in such cases the film can be transferred, as above described, and the negative saved.

H. BURTON.

*Ealing Dene.*

#### Proceedings of Societies.

##### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The usual weekly meeting was held on the 22nd inst., F. W. Cox in the chair.

J. HUBERT exhibited untouched prints from a negative that had been taken with his flash lamp shown at the previous meeting. The compound he used was composed of—

Chlorate of potash	...	...	...	12 parts
Magnesium powder	...	...	...	6 "
Prussiate of potash	...	...	...	1 part

12 grains of this mixture forming a charge. He noticed that several seconds elapsed after contact with the gas flame before



the charge ignited. Would this be due to the prussiate of potash? Replying to a member as to his object in adding this chemical, he said a German chemist had recommended it to him.

A. HADDON would give a preference to sugar, rather than the prussiate of potash, as tending to lessen the risk of any cyanide compound being set free.

W. BEDFORD said if sugar was mixed with the potash, a drop of sulphuric acid would fire the compound.

The HON. SECRETARY, in passing round a print of a group of members attending the Derby Convention, said he believed it had not been exhibited before. It had been sent to him by H. M. Smith, of Huddersfield.

L. MEDLAND had noticed, with negatives taken with a detective camera, a weakening of the image at the sides of the plate. He passed round a series of prints, from negatives taken with a detective camera, by a friend who accompanied him on his recent tour, all more or less showing this defect.

C. P. CEMBRANO said some negatives taken by J. B. B. Wellington with a detective camera had a similar effect.

Several members were of opinion that it was due to the shutter, it being elicited that the shutter in each case was used in front of the lens, and opened from the centre.

S. G. WOLLASTON said a lens was frequently strained by using too large a stop. The best position for the shutter would be between the lenses.

The CHAIRMAN drew attention to some unpleasant-looking spots that were gradually appearing on a negative which he exhibited, and asked if any member could suggest a remedy. The negative had been taken about two years; a print was also shown printed soon after the negative was made.

F. H. BERRY recommended the application of a very weak solution of ferridcyanide and hypo, the film having been previously well wetted.

F. A. BRIDGE, referring to the death of Norman Macbeth, said the Association had lost a most able, earnest, and conscientious guide-man. He (F. A. Bridge) proposed that a vote of condolence should be forwarded to the family. By the death of Mr. Macbeth he had lost a personal friend for whom (in common with all who knew him) he had the highest possible respect and esteem.

The vote was carried unanimously.

The CHAIRMAN said that on the authority of an article in the ALMANAC he had used sulphite of soda to obtain black images. He was not always successful. He showed a negative of a brown colour, after using the sulphite.

A. HADDON asked whether the plate was what would be called a slow or quick one. A slow plate would give a blacker image than a rapid one. The colour would also be determined by the amount of iodide in the emulsion, which would tend to give a yellower image.

H. P. EVERITT said he had found that long exposures gave a yellowish tinge with sulphite. With short exposures a blacker image was the result.

J. J. BRIGINSIAW said plates developed with ordinary washing soda changed to a yellow colour in the washing water. This was an advantage with lantern transparencies.

W. COBB remarked that the yellow colour, if objectionable, could easily be changed by putting the plate, after fixing and before washing, in an alum bath. He did not consider a yellow image altogether a disadvantage.

A. MACKIE had used alum in the fixing bath with collodio-bromide plates, the only difference he noticed being that the bath, usually cloudy after use, kept quite clear with the addition of the alum.

A question from the box was read: "What is the exact chemical composition of metabisulphite of soda?"

Some little discussion followed, but little of a definite nature was elicited.

L. MEDLAND wished to draw the attention of members to the hydroquinone developer. He had recently developed thirty-six plates in the same solution, the formula he used being that known as "Ingall's," and published in the *British Journal of Photography*, and also the *Photographic World*.

Sulphite of potash	...	...	3 drachms
Metabisulphite of potash	...	...	1 drachm
Tartrate of potash	...	...	1½ drachms
Carbonate of potash	...	...	1½ ounces
Hydroquinone	...	...	1 drachm
Water	...	...	5 ounces

For use take 1 drachm to each ounce of water. The developer remained quite clear, the details in each case coming out at the

same time; rocking the tray was not necessary. Another advantage was that the fingers were quite free from stain.

W. BEDFORD had used the hydroquinone developer; he considered it an excellent developer, giving perfectly clear shadows and quick printing negatives.

#### NORTH LONDON PHOTOGRAPHIC SOCIETY.

At the ordinary meeting, on March 20, at Myddelton Hall, Islington, J. TRAILL TAYLOR in the chair, the proceedings commenced with a presentation to the late Hon. Secretary, H. M. SMITH, who had unexpectedly come to town, and was present at the meeting.

The PRESIDENT, in handing Mr. Smith the testimonial—a handsome spirit stand and fittings—said that he was glad to be able to make the presentation personally, instead of sending the article down to Huddersfield. As they had had but a few hours' notice, the committee had been unable to have the inscription plate fixed before the commencement of the meeting. All the members appreciated the fact that the present healthy and flourishing state of the Society was mainly due to Mr. Smith's exertions, and the present gift was intended to mark their recognition of these services, and not in any way as a payment or reward for them.

Mr. SMITH said that the presentation was a pleasant surprise for him, and he could not help feeling gratified at the way in which the Society had recompensed his labours as hon. secretary. These labours, he was glad to say, had been rendered easy and pleasant by the assistance and co-operation of the officers and members, and he very much missed their pleasant companionship and photographic chat now that he had made his abode in a provincial town. In conclusion, he would beg the subscribers to accept his most sincere thanks—thanks which were not the less hearty because he felt they could not be adequately expressed in words.

A. MACKIE thought the present a most appropriate one, as he was sure their late hon. secretary was always present with them "in spirit" on their meeting nights.

The ordinary business of the evening was then commenced by Mr. SMITH, who said that he had lately been giving more attention to lantern matters. He had found a set of three meniscus lenses, which could be used singly or in combination, of great value in giving a picture of any required size at widely varying distances from the screen, and recommended the Society to procure such a set with the necessary telescopic tube.

E. CLIFTON said that he knew of a case where another society had procured a set. They were, however, glad to exchange them for a good carte lens. The single lenses required considerable stopping down, and even then did not give good enough definition to satisfy an audience of photographers.

The PRESIDENT said that single lenses did not give such good definition when used in the lantern as a double combination did. There was also with the shorter focus lenses a considerable amount of pincushion distortion. He had some years ago introduced a lantern objective with a large back lens possessing a large amount of negative spherical aberration, so as to give a very flat field, with a short focus lens.

Mr. SMITH then passed round a group of members of the Photographic Convention at Derby which had not previously been exhibited, also prints from stripping films and backed plates.

Mr. TAVENER exhibited prints on Obernetter paper, and an interior taken by Hart and Bishop's flash lamp, using fifteen grains of powder.

Mr. READER exhibited several landscape and interior pictures.

L. MEDLAND showed a large number of prints from negatives taken by a friend with Watson's detective camera, and also a few transparencies from some of the same negatives. In answer to a question, he said the latter, on collodio-bromide, &c., were developed with Ingall's hydroquinone developer. He had developed thirty transparencies in two ounces of the diluted developer, and even then it was not exhausted.

Mr. HISCOCK showed several good transparencies on Fry's lantern plates. They were developed with soda, and were of an excellent colour.

J. NESBIT exhibited a stereoscopic transparency of members of the Society at Winchmore Hill. He said he could not agree with Mr. Medland's method of using the same developer over and over again, as it must vary in its composition in power with successive usings.

Mr. MACKIE said that he had found that even the second transparency, developed in the same developer, showed a deteri-



oration. This might be less with hydroquinone, but still must occur.

Mr. MEDLAND had not found any such deterioration.

A short discussion on "Mountants" then followed, after which it was announced that Mr. Bishop would give a demonstration of Eastman's transferotype at the next meeting.

It was decided that the Society should have its first outdoor meeting on Easter Monday, and St. Albans was chosen as the scene of operations. Members will leave King's Cross by the first train after 10 a.m., meeting at the Peacock Hotel, St. Albans, at 12 noon.

#### CAMERA CLUB.

THE lantern evening, on Thursday, March 22nd, was specially interesting to members as being the occasion for the first use of the new club lantern supplied by Mr. Dallmeyer. There was an excellent collection of slides, the contributors being the Woodbury Printing Company, and Messrs. Spiers, Pringle, Donkin, Ferrero, Davison, Gale, and Freshwater. The Woodbury slides were magnificent in technique. Other processes illustrated were collodio bromide and gelatine bromide, by Mr. Pringle; gelatine with ferrous oxalate development, by Mr. Donkin; and wet collodion, by Mr. Gale. Mr. Freshwater supplemented the exhibition by a few remarks on coloured slides, illustrating his address by a comparison of slides of the same subject, coloured and plain. For this purpose he used a very compact and effective lantern, by Messrs. Newton, of Fleet Street.

On Thursday, April 5th, the subject will be "Stereoscopic Photography," by A. Stroth.

#### BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE usual fortnightly meeting was held in the Technical Schools, Bridge Street, on the 23rd inst., E. H. JACQUES in the chair.

H. Bartlett, H. Cole, A. Darby, J. Gladstone, G. Jenkins, J. H. Shobotham, C. A. Smith, A. L. Sterne, and E. W. Taylor were elected members; and J. Stiles, Thomas Shrieves, and P. Wigley were nominated for election.

Lantern slides were exhibited by J. W. Morre; an apparatus for taking reversed negatives direct, by E. C. Middleton; and W. J. Harrison showed a curious old book on "Hillotype," said to be the secret of photographing in colours.

A. C. TOWNSEND then delivered his paper, entitled "Sunshine and Shadow," from a beginner's point of view, giving a long enumeration of the failures and trials of an amateur.

THE CHAIRMAN said beginners could have plenty of advice if they would only ask for it; but the difficulty would arise which process to select from the multitudinous processes which would be recommended. He advised the beginner to use the question-box. In the case of exposure this is a difficult question, but he himself always judged by the appearance of a picture on the ground glass.

GEORGE A. THOMASON recommended Beach's developer, and considered it would do everything required in the way of obtaining plucky negatives, which will give good prints; always bearing in mind to keep the potash back.

E. C. MIDDLETON thought there was really great latitude in exposure, which, by careful development, can always produce good pictures.

G. M. ILIFF had recently exposed on a landscape with 6, 10, and 16 seconds, and in development had obtained precisely similar results.

A. A. NOCK: Beginners, and many amateurs, made a great mistake in not appreciating the separate and individual action of the pyro, alkali, and the bromide.

J. H. PICKARD: Professionals themselves are in reality amateurs or learners at first.

E. H. JACQUES did not recommend hydroquinone; he had spoilt many plates in using it. Amateurs should not try to compete with professionals in portraiture; landscape is properly the amateur's true field.

H. P. FOSTER recommended rubbing the focussing screen with vaseline or castor oil to get better definition, and marked on the board the lines an amateur should draw on his ground-glass to guide him in forming an artistic picture.

G. M. ILIFF recommended glycerine, and E. C. MIDDLETON white wax dissolved in ether, as a good substitute (for focussing screen) rubbed on plain glass.

E. H. JACQUES remarked that to get a purple tone in prints, a good negative was a *sine qua non*.

B. KARLEESE always fumed his paper with ammonia, and used chloride of lime in his bath.

H. P. FOSTER also found it necessary to fume the paper with ammonia, and the negative must be clear in the shadows.

E. C. MIDDLETON: One should tone quickly to get a purple tone. Carbon printing will give any tone required. (Autotype Co.)

GEORGE A. THOMASON had heard of the difficulty of getting purple tints if the paper was dry. The paper should be moderately damp, and printing frames should not be allowed to get hot in the sun.

J. H. PICKARD, when mounting prints, uses Mawson's mountant, which does not cockle the prints.

E. C. MIDDLETON: Nothing better than starch; it should be boiled and made as thick as possible; use gum arabic, with a little sugar and camphor, when it is required to mount prints with a glaze.

G. M. ILIFF cautioned against the use of inferior gum arabic, and mentioned the simplicity of Wolff's mounts.

A. A. NOCK said that sugar was dangerous to use in mountants, unless used in very small quantities.

Excursions were announced for Kenilworth on Friday, the 30th inst., and to Shrewsbury on Monday, April 2nd.

#### YORKSHIRE COLLEGE PHOTOGRAPHIC CLUB.

THIS Society met on Thursday, the 22nd inst., the President, C. H. BOTHAMLEY, in the chair.

Prof. A. BARR read a paper on "Copying for Lantern Slides by Means of the Camera." He described and exhibited an apparatus which he has devised for the expeditious copying of book illustrations, &c., for the production of lantern slides for class purposes. The book, drawing, &c., is suspended vertically, its centre coinciding with a vertical line through the axis of the camera. The camera can be raised and lowered in such a way that it always remains horizontal, and the adjustment of the distance of the camera from the object, and the focussing, are effected by means of scales attached to the apparatus. Prof. Barr also exhibited the arrangement adopted in the college for the exhibition of lantern slides to classes in well-lighted rooms.

THE PRESIDENT placed on the table a copy of Wilson's photographic reproduction of Burnet's "Essays on Art," and he also exhibited and described a new form of tripod stand, invented by J. W. Ramsden, of Leeds. This stand has sliding legs, but no screws, and the triangle is permanently attached to the stand, and folds up with it. The stand can be set up and re-packed with great expedition.

#### DUKINFIELD PHOTOGRAPHIC SOCIETY.

A PRELIMINARY meeting was held in Dukinfield on March 21st, to consider the advisability of forming a Photographic Society on the same lines as other societies. JOHN S. LEES occupied the chair, and there was a very fair attendance of professional, amateur, and would-be photographers.

THE CHAIRMAN pointed out the objects of such a Society, and after some discussion it was unanimously decided that a society be formed.

W. H. SHIRLEY was appointed Honorary Secretary. The subscription to be 5s. per annum. A considerable number of gentlemen gave in their names, and, judging from the interest manifested, the Society has every prospect of a useful and successful career.

#### GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting was held in the rooms of the Association, 180, West Regent Street, Glasgow, on the 20th inst., RALPH H. ELDER in the chair.

Dr. McCORKINDALE gave a demonstration of a new artificial light for portraiture, and explained that it was produced by the combustion of a mixture of carbon disulphide vapour and nitric oxide. He first showed the production of nitric oxide by the action of nitric acid on copper turnings, the gas being collected over water in a pneumatic trough in a glass jar of about 100 ounces capacity. In this operation care must be taken that the jars are quite filled with water before any gas is admitted, otherwise an explosive mixture might be produced by the presence of air. The nitric oxide having been prepared, about four drachms of carbon disulphide was poured into the jar, and the stopper quickly replaced, the jar being then shaken up for a few seconds. Meanwhile several



cameras had been set up, and the President posed before them. The stopper of the jar being removed, a lighted taper was applied, and an instantaneous flash resulted of a brilliant blue tint, but not very luminous, so that there was no distress to the eyes of sitters or spectators. The jar used was long and narrow, and the inrush of air after the flash caused a loud musical note, which a timid person might have called an explosion; but had a wider jar been used there would have been no sound. The lenses used were rapid symmetricals, stop  $f/8$ , and the plates of various "extra rapid" makes. The resulting negatives were well exposed, and the lighting fairly soft.

A group of a number of members was then taken, but in this case a larger quantity of carbon disulphide was shaken up in 100 ounces of nitric oxide. The result was a prolonged blaze of bright blue light, lasting about half a second, and quite noiseless. This light has the advantage of causing no smoke as magnesium does, and is free from any dazzling glare. On the other hand, there is the objectionable smell of the carbon disulphide, which should, when possible, be added out of doors.

During the evening a number of novelties were handed round for the inspection of the members, and at the close of the meeting a number of frames of prints were exhibited, from which a selection was made by ballot to form the Association's exhibit at the Glasgow International Exhibition.

### Talk in the Studio.

ROYAL INSTITUTION.—Among the lectures announced as to be delivered after Easter are the following:—Charles Waldstein, three lectures on John Ruskin; Sidney Colvin, three lectures on Conventions and Conventionality in Art; Professor Dewar, six lectures on the Chemical Arts; Francis Galton, Personal Identification and Description; Professor J. A. Ewing, Earthquakes, and how to measure them; and a discourse by Professor Dewar.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The monthly technical meeting of this Society took place on Tuesday last, the 27th inst, when a paper by T. Bedford, on "Orthochromatic Photography," was read, and an interesting discussion followed. The report will appear in our next issue.

INFLUENCE OF ULTRA-VIOLET LIGHT ON THE ELECTRIC DISCHARGE.—BY H. HERTZ.—The author has discovered that ultra-violet radiation favours the electric discharge between two conductors in a remarkable way. As sources of such radiation, the sun, burning magnesium, or even ordinary flame, may be used; but by far the most effective are the electric arc and an induced electric discharge. To produce the phenomenon, the primary circuits of two induction coils, a large one (10 cm.) and a smaller one (1 cm.), are joined in circuit with the same battery (six Bunsens) and interruptor. Perfect synchronism in the induced discharge is thus secured. The terminals of the large coil being arranged to give a good spark 1 cm. in length, the two coils are placed close together, and an opaque screen interposed. The terminals of the small coil are then drawn apart until sparks just cease to pass. On now removing the screen the discharge is re-established. The author describes many experiments to test the nature of the effect. The influence is not electrical, since non-conducting screens are effective as well as metal plates. It varies in some inverse ratio with the distance, and is distinctly produced when the coils are 1 m. apart. In the above experiment, the larger spark may be either short and dense, or long and zig-zag, and every part of it is effective. The smaller spark, however, should be short (between knobs); the seat of the action upon it appears to be in the neighbourhood of the cathode or negative pole. The influence is reciprocal; that is, the smaller spark also favours the larger. The action is propagated in straight lines, like light, and may be reflected from polished surfaces. It may also undergo refraction; but its refrangibility (roughly measured by means of a quartz prism) is much greater than that of the violet rays. Most solid substances are opaque to it; amongst these glass, paper, agate, and mica, even in the thinnest sheets, are noticeable. Amongst crystalline substances, copper sulphate, topaz, and amethyst are opaque to it; but it is transmitted by sugar, alum, calc-spar, and rock salt; transparent gypsum and rock crystal transmit it perfectly. Amongst liquids, water transmits it freely; sulphuric and hydrochloric acids, alcohol, and ether, less so; whilst melted paraffin and petroleum, benzene, bisulphide of carbon, ammonium hydrosul-

phide, and coloured liquids generally, stop it completely. Solutions of potassium, sodium, and magnesium sulphates, are fairly transparent to it; those of mercuric nitrate, sodium thiosulphate, potassium bromide and iodide, are very opaque. Amongst gases, air, hydrogen, and carbonic anhydride are very transparent; chlorine, and bromine and iodine vapours, partially so; and coal-gas and nitric peroxide very opaque. Even an ordinary candle-flame may produce effects similar to these described, and may cause the reappearance of sparks between the terminals of an induction-coil after they have been drawn so far apart that the discharge has ceased. Similar effects are produced by the luminous flames of gas, wood, benzene, and the non-luminous flames of alcohol, carbon bisulphide, and the Bunsen burner. Incandescent platinum, and the flames of sodium, potassium, sulphur, and phosphorus, and of pure hydrogen, are without effect. The effective rays are more refrangible even than the so-called photographic rays; for the latter are not sensibly absorbed by coal-gas.—*Chemical Society Abstract.*

### To Correspondents.

\* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.1;" while Advertisements and Business letters should be forwarded to "PIPER AND CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.1."

PHOTOGRAPHER.—1. It is not likely to happen unless the pictures are exposed to extreme damp. 2. It would be in no way advantageous. 3. One part of gutta-percha in ten of carbon disulphide. 4. The Gutta Percha Company, Wharf Road, City Road, London.

APPRENTICE.—There is no book in English on the subject, but a German work by Allgeyer is excellent. You can order it from Trübner and Co., foreign booksellers, Ludgate Hill.

DELPH.—We do not know of any stock commercial lens so small, but you had better write to a London optician.

J. HUBERT.—The letter you send for insertion is unsigned, but we take it that you intended it to appear with your name. If so, authorize us to add it.

TOLYBECK.—Whether "Copyright" is printed underneath, has nothing to do with the question; but you may reproduce the photograph, provided you do not sell a copy.

W. E. DEBENHAM.—We believe it was read, but more when we see you.

L. CROMER.—1. If in excess, the difficulty will not occur. Add the ammonia until, after well shaking, there is a decided smell of ammonia. In order to eliminate all possibility of being deceived by the vapour of ammonia hanging about in the air-space over the liquid, you had better pour it into another vessel before coming to a conclusion from the smell of the ammonia. 2. Sheet brass is not so suitable as lead for lining the trough, but the best thing will be to obtain a white earthenware sink. There is a shop on the east side of Farringdon Road, near the Viaduct, where they can be obtained. 3. It is so purely a personal matter, that we cannot hazard an opinion as to what he ought to do. One course appears to us to be quite as equitable as the other. 4. We quite agree that they did not even deserve the third class award given to them, but certainly do not consider the matter sufficiently important to require a special article.

WEST FINCHBURY.—1. The PHOTOGRAPHIC NEWS is quite an independent publication, in the sense that it is neither the organ of any photographic society or any trading house. 2. We cannot tell you of what societies it is the organ, but it professes to be the organ of several. 3. This is a question for a legal expert. 4. Write to the constructor—you will find his address in the list of members issued by the Photographic Society of Great Britain.

C. WILLIAMS.—We are afraid that there will be a difficulty in bringing about legislation on the subject. 1. He is a professional photographer in the fullest sense of the word.

B. BROS.—See article on page 433 of the PHOTOGRAPHIC NEWS for 1887.

A. T. H.—If your statements are strictly correct, and nothing material to the case is unstated, it is a matter which, in the interest of the photographic public, should be thoroughly exposed. We will probably say something about it next week, and in the meantime pay nothing more, retain the receipt for what you have paid, and send us on additional particulars, if anything material remains unstated.

L. R. L.—Unless the photograph was registered in the name of the original producer of it before a copy was sold, there is no copyright in the photograph, and any person may sell it. As regards copyright in the design of the carving, we are not sure whether it extends beyond the life of the carver (even if all formalities were observed), but we think you may take it as certain that there is no copyright if the carver has been dead for twenty years.



# THE PHOTOGRAPHIC NEWS.

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## GLAZING PRINTS.

THERE certainly appears to be a growing tendency at the present time in favour of matt prints, both as regards paper and other surfaces; yet we are convinced that many amateurs, as well as a numerous circle of friends who criticise the photographs which are from time to time produced, appreciate to the full extent the high gloss most prints are capable of yielding when suitably treated. It is not altogether the brilliant surface obtained which, in many cases, draws forth admiration; we think it is probably the greater richness and purity of tone which results from a glazing process that enhances to such a marked degree the beauty of the work, imparting as it does a quality only equalled in prints mounted in optical contact with glass.

One or other of the various published methods of glazing is generally employed by professionals in their everyday practice, and amateurs of long experience are well acquainted with all details necessary for securing any reasonable amount of glaze should they desire to finish the work they produce in such a manner. We are convinced, however, that less experienced hands frequently regard glazing processes as being somewhat tedious and uncertain. Perhaps under conditions which are not favourable this may be true; indeed, old hands fail under such circumstances, both in successfully burnishing mounted prints, and enamelling with collodion and gelatine. But we do not propose to enter into particulars regarding either of those methods in the present article, as a simpler, and for many purposes useful to the amateur, quite as satisfactory results, can be relied on without any difficulty by the means we desire to bring under notice. The plan hereinafter mentioned is more especially suited for photographs which are not destined for mounting afterwards on cardboard or other rigid support. For unmounted views and various other subjects which may be intended for transit through the post, or for insertion in books other than by means of pasting, the method is of value owing to its extreme simplicity, and the rapidity with which the work can be accomplished. Positives on bromide paper are equally amenable to this treatment with prints on albumenised paper, and we know several amateurs who prefer to produce all their prints on bromide paper, finishing as we now describe.

A sufficient number of glass plates, larger than the photographs to be glazed, are selected free from scratches, and cleansed of adhering particles or patches of dirt by scouring with a hot solution of washing soda. Rinsing the plates in clean cold water follows, after which they should be dried, and are in that state ready for further treatment. This consists in smearing over the chosen surface of each plate a mixture of wax and resin in turpentine. Three drachms of beeswax and one ounce of yellow resin dissolved in enough turpentine to fill a wine bottle is a good work-

able proportion, but there is no necessity for precise quantities.

The wax compound should be well distributed over the glass plate by rubbing with a pledget of cotton-wool the first time the plate is used for this purpose. After being employed a few times waxing becomes quite superfluous, as the prints attached to such surface readily peel off as soon as dry. If dry prints are to be glazed they should be placed in cold water until pliable, after which all that remains to be done is to squeegee each down with the surface in close contact with the waxed glass plate, and as soon as each becomes dry they will part company, the prints having acquired a high-glazed surface. Should any defects arising from scratches, &c., appear, re-soak the print and squeegee upon another plate.

## EXHIBITION OF PHOTOGRAPHS AND PHOTOGRAPHIC APPARATUS TO CELEBRATE THE JUBILEE OF THE EMPEROR FRANCIS JOSEPH I.

THE Amateur Photographic Club of Vienna propose to hold an exhibition at the Austrian Museum of Arts and Manufactures, in Vienna, from September 15th till October 25th, 1888.

The committee is as follows:—President—Charles Srna; Vice-President—Dr. Frederico Mallmann; Secretaries—Anthony Einsle and Dr. Julius Hofmann; Cashier—Alfred Werner; Librarian—Augustus Chevalier de Loehr. Ordinary members:—Alfred Baron de Liebig, M. Eric Conditt, Arnold de Kneusel-Herdliczka, Louis Kapferer, Count Rudolph Welsersheimb, Frederic Vellusig, Victor Toth, Charles Ulrich, and Joseph Vogl.

A special executive committee, consisting of Alfred Baron de Liebig, Charles Srna, Dr. Julius Hofmann, Charles Ulrich, Count Rudolph Welsersheimb, Dr. Frederico Mallmann, Anthony Einsle, and Augustus Chevalier de Loehr, has been entrusted with the details of the arrangement.

The forthcoming exhibition is intended to embrace every branch of art and manufacture connected with photography, and thus will afford to those who make a study of it, whether professionally or otherwise, an opportunity of becoming acquainted with the most recent improvements and developments introduced by home and foreign firms. The Club's Daguerre medal and certificates of honourable mention will be awarded in each class of photography, photographic apparatus, lenses, &c., provided the jury deem any exhibit or exhibits of sufficient merit. From the decision of the jury there is to be no appeal. As far as the Club's funds permit, the Club will purchase the most interesting exhibits. Amateurs have not to pay hire for the space allotted to them, and on application



they can obtain the use of frames free of charge, and admission will be free five days a week.

#### CLASSIFICATION.

**Class A. Photographs.**—Section 1.—(1) Landscapes, Architecture, Interiors; (2) Portraits, Groups, Studies; (3) Genre-pictures, Animals, Still-life; (4) Instantaneous Photographs; (5) Orthochromatic Photographs; (6) Combination Pictures; (7) Stereoscopic Slides. Section 2.—(8) Astronomic Photography; (9) Microscopic Photography and Micro-Photography; (10) Photogrammetric Photographs; (11) Other Scientific Photographs. Section 3.—(12) Pictures of Machinery and other Industrial Art-Objects; (13) Magic Lantern Slides; (14) Photographs on Wood, Glass, Linen, China; (15) Reproductions and Enlargements. Section 4.—(16) Different Negative Processes; (17) Different Positive Processes; (18) "Lichtdruck," Heliotype, Photo-engraving, &c.; (19) Sundries. Section 5.—(20) Photographs taken by Artificial Light.

**Class B. Bibliography of Photography.**—(21) Books about Photography and the Allied Sciences.

**Class C. Photographic Apparatus and Appliances.**—(22) Cameras for Studios, Reproduction, Detectives, &c.; (23) Tripods and Studio Stands; (24) Studio and Laboratory Furniture and Appliances; (25) Lenses; (26) Instantaneous Shutters; (27) Sciopicons, Enlarging Apparatus, Magic Lanterns; (28) Apparatus for Artificial Light; (29) Stereoscopes, Graphoscopes, &c.; (30) Complete Outfits for Amateurs; (31) Dry Plates, Positive and Negative Paper, &c.; (32) Mounts, Albums, &c.; (33) Frames; (34) Sundries.

#### RULES AND REGULATIONS.

I. Applications on a form, which can be obtained on application, properly filled up, are to be sent in to the Executive Committee not later than July 1st, 1888.

II. All goods and pictures, accompanied by a customs-declaration and carriage-paid, must reach the Executive Committee not later than August 20th, 1888. Exhibits from abroad are free from duty if re-exported.

III. The Executive Committee reserves to itself the right of rejecting any exhibits.

IV. Amateurs have not to pay rent or any other charges.

For Classes B. and C. the following prices have been fixed—

a. For insertion in the catalogue, not exceeding half a page, 16s. 6d., for each exceeding half page 13s. 6d. The catalogue will have an appendix of advertisements for which the rates will be:—For a whole page 25s., half a page 13s. 6d., a quarter of a page 8s. 6d., an eighth of a page 5s. 6d.

b. For placing, use of show-case, and suitable decoration of the first-square metre of space occupied (floor, table, wall), 16s. 6d.; for each succeeding square metre, 8s. 6d.

c. 5 per cent. of price received for any articles sold at the Exhibition.

d. No exhibits will be allowed to be removed before the close of the Exhibition. The Executive Committee will have all objects insured against fire; but, while exercising all reasonable care, will not undertake any responsibility for other damage or loss.

V. At the close of the Exhibition each exhibitor, or his deputy, must pack and remove his goods at his own expense. Messrs. Schenker and Co. will, if desired, undertake this for foreign exhibitors.

VI. The Executive will assign spaces and determine the arrangement of exhibits.

VII. Frames will be lent to amateurs free of charge.

VIII. A non-transferable admission ticket will be supplied to each exhibitor, which will pass the holder into the Museum without payment on each day of the Exhibition.

IX. No dangerous or explosive substances shall be admitted.

X. The Executive Committee reserves the right of issuing further rules.

XI. All communications and remittances to be addressed to the Chairman of the Executive Committee, care of Carl Sma, 7, Bezirk, Stiftgasse 1, Vienna, Austria.

#### THE LITERATURE OF PHOTOGRAPHY.

BY W. JEROME HARRISON, F.G.S.\*

(41) **PHILOSOPHICAL (THE) MAGAZINE.** Comprehending the various branches of science, the liberal and fine arts, agriculture, manufactures, and commerce. By Alexander Tilloch. 42 vols., 8vo.; 1798-1813. London.

\* Continued from page 154.

United in 1814 with the *Journal of Natural Philosophy*, by W. Nicholson, and continued as:—

(41a) **PHILOSOPHICAL (THE) MAGAZINE AND JOURNAL.** By A. Tilloch (from 1824 by A. Tilloch and R. Taylor). 26 vols. (xliii. to lxviii.); 8vo. 1814-26; London.

United in 1827 with the *Annals of Philosophy or Magazine of Chemistry*, by R. Phillips, and continued as:—

(41b) **PHILOSOPHICAL (THE) MAGAZINE; or, Annals of Chemistry, Mathematics, Astronomy, Natural History, and General Science.** By Richard Taylor and Richard Phillips. 11 vols. (i. to xi.); 8vo.; 1827-'32. London.

United in 1832 with the *Edinburgh Journal of Science*, by David Brewster, and continued as:—

(41c) **LONDON AND EDINBURGH PHILOSOPHICAL MAGAZINE AND JOURNAL OF SCIENCE.** Conducted by D. Brewster, R. Taylor, and R. Phillips. 37 vols. (i. to xxxvii); 8vo.; 1832-'50. London.

Continued under the title:—

(41d) **London (The) Edinburgh and Dublin Philosophical Magazine and Journal of Science;** being a continuation of Tilloch's Philosophical Magazine, Nicholson's Journal, and Thompson's Annals of Philosophy. Conducted by Sir R. Kane, Sir W. Thomson, and W. Francis.

Fourth Series, 1851-75; fifty vols. 8vo.

Fifth Series; 8vo.; 1876-88+.

Published by Taylor and Francis, Red Lion Court, Fleet Street. Monthly, 2s. 6d.

The *Philosophical Magazine*, as it is familiarly termed, is a library in itself, and the fortunate possessor of a complete set will be able to refer to many excellent papers on photography by the leading men of the day, either written specially for the Magazine, or transferred from the memoirs of the various scientific societies. It was, for example, the medium by which Draper published for England and the Continent his papers written in America.

(42) **PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY OF LONDON:** 1665-1888+; large 4to. Issued annually in two parts, price from £1 to £3 per part; but the papers included in each part are also sold separately, at from 1s. to 5s. each, or thereabout. Vol. clxxvi. for 1885 has 800 pp., and 75 plates.

Published by Harrison and Sons, St. Martin's Lane; also sold by Trubner and Co., Ludgate Hill, and J. Murray, Albemarle Street.

The Royal Society (one of the oldest, and certainly the most important scientific society in the world) also publishes an annual volume of *PROCEEDINGS*, price 21s., which includes the President's address, the shorter papers, obituary notices, &c. Vol. xxxix., for 1885, contains 535 pp. 8vo.; it is sold by the same publishers as the *Phil. Trans.*

Important papers on photography by Abney, Huggins, Hartley, &c., have appeared in the *Transactions and Proceedings* of the R.S. The head-quarters of the Royal Society are at Burlington House, Piccadilly.

(43) **PHOTOGRAPHER (THE); an ever-circulating Manuscript Photographic Journal.** Editor, John Traill Taylor, Dumfries. 1856.

Conceived and put in operation by four amateur photographers of the North, this little journal was quite a success. Thomas Sutton, George Shadbolt, and other well-known men contributed to it. The name of the editor (who was then Hon. Secretary of the Dumfries and Galloway Photographic Societies) has since become one of the best known in the world of photography as editor of the *British Journal of Photography*. Specimens of the processes described were enclosed with the written descriptions. The circulating note-books and albums of the *Postal Photographic Society* of the present day are of a somewhat similar nature.

(44) **PHOTOGRAPHER (THE); a monthly journal of jottings;** 8vo., 1880-88+. Price 3d. George Mason & Co., 180, Sauchiehall Street, Glasgow.

A pleasant little journal issued by a firm of world-wide reputation as dealers in photographic apparatus.



(45) PHOTOGRAPHER (THE). Nos. 1 and 2 (all published) 12mo., eight pages each. Exeter, W. Roberts, printer, Broadgate.

This is a "sell," being in reality a tract, or religious magazine. At least the only sentence I can find bearing on photography is—"The light which falls on you is unsteady," a sentiment with which we quite agree. I pounced upon this publication with great delight in the British Museum library; and fellow-photographers will imagine my disappointment.

(46) PHOTOGRAPHER'S ANNUAL, and Illustrated Almanack; 1870; see Illustrated Photo. Almanac.

(47) PHOTOGRAPHER'S POCKET ALMANAC AND REMINDER; 1871-85||; small 32mo.; Cussous & Co., Southport (afterwards at Liverpool). Price 2d.

A useful little publication by a well-known firm of dealers in photographic apparatus. The business was discontinued in 1886.

(48) PHOTOGRAPHER'S (THE) WORLD. Monthly, No. 1., 4to., 6 pp., issued April 15th, 1886. Published by Percy Lund & Co., The Country Press, Bradford (formerly of Ilkley).

The "P.W." is a pleasant magazine "for the profession only," to whom it is sent gratis and post free; about 5,000 copies are despatched through the post monthly to professionals at home and abroad. A charge of 2d., each is made for back Nos. Each number now consists of 12 pp., and is illustrated.

(49) PHOTOGRAPHIC (THE) ALBUM, for the year 1855, being contributions from the members of the Photographic Club, 1855; folio. London: printed by Charles Whittingham.

This fine book contains forty-four photographs, some as large as 13 by 9 inches, with a description of each, and particulars as to process, light, exposure, lens, diaphragm, &c. It includes some of Fenton's Crimean photographs. Most of the pictures in the copy which I examined (British Museum library) are still in a state of very fair preservation.

(50) PHOTOGRAPHIC (THE) ALBUM OF LITERATURE AND ART: No. 1, for May, 1858; 4to., 4pp., London; Houlston and Wright. Price 1s.

This number (all that was published) contains a portrait (now faded), and memoir of the Princess Frederick William of Prussia.

(51) PHOTOGRAPHIC (THE) ART JOURNAL. From No. 1, February, 1858, to No. 8 for December, 1858; published by W. Lay, 13, King William Street, Strand. Price 2s. 6d. per number; 4to.

The photographs (all faded) in the copy I examined were about 9 in. by 7 in.; the letter-press of the eight numbers included 110 pages.

(51a) The collected numbers of the last named periodical were issued as the PHOTOGRAPHIC ART ANNUAL, by the same publisher, Christmas, 1858. Price 21s.

(52) PHOTOGRAPHIC (THE) ART JOURNAL. Illustrated with photographs printed in permanent pigments. Monthly; 4to. Four numbers only published, March to June, 1870; containing 64 pp., and thirteen photos., in Woodburytype, &c.; S. Low, Son, and Maistou, London. Price 2s. 6d. per number.

In June, 1870, their magazine was discontinued and incorporated with

(52a) ART, PICTORIAL AND INDUSTRIAL. An illustrated magazine. Vols. 1-3. London. 1870-72, folio.

New series (edited by J. F. Robertson. Vols. 4-6. London. 1872-75; 4to.

(53) PHOTOGRAPHIC (THE) ATHENÆUM; one sheet, 4to., January 8th, 1859. London, J. Holmes, Took's Court.

The letter-press consists solely of a report of the sixth exhibition of the Photographic Society of London. The object of publication was to secure a copy-right in the title.

(54) PHOTOGRAPHIC ILLUSTRATIONS. By members of

the Manchester Photographic Society; January, 1856; 4to. Published by G. Simms, 15, St. Aune's Square, Manchester.

The single number in paper covers which the British Museum Library possesses is apparently all that was published. It contains four photographs (all faded) with a description of each.

(55) PHOTOGRAPHIC JOURNAL (THE). Edited by H. W. Diamond. Entered at Stationers' Hall. No. 1 for Tuesday Dec. 28th, 1858, price 6d., pp. 8. Printed and published by Taylor and Francis, Red Lion Court, Fleet Street.

This appears to have been issued in connection with some question as to copyright in the title *Photographic Journal*. It was a sort of special number of the Journal of the Photographic Society.

(56) PHOTOGRAPHIC MAGAZINE. Edited by P. H. Delamotte. 1857. Parts 1 to 3. 12s. each. Chapman and Hall, London.

(57) PHOTOGRAPHIC MAGAZINE. 1863. Monthly 1s. 5, Heurietta-street, Covent Garden, London.

(58) PHOTOGRAPHIC NEWS (THE). A Weekly Journal of the Progress of Photography, Thirty-one vols., 4to. 1858-88+. No. 1 published Sept. 10th. 1858. Price 3d.

Vols. i. and ii. bear the name of W. Crookes (the distinguished chemist) upon the title-page as editor, and the *News* was then published by Cassell, Petter, and Galpin. Vol. iv. was published by Thomas Piper (now Piper and Carter), a firm which has ever since continued to publish the paper; the office being now at 5, Farnival-street, Holborn, London, E.C.

The name of G. Wharton Simpson appears as editor on the title-page of Vol. v. (for 1861), and he conducted the P.N. until his death, on Jan. 14th, 1880, when he was succeeded by Henry Baden Pritchard (died May 11th, 1884); after whom came the present editor, Thomas Bolas.

The *News* was the first weekly photographic paper, and it has been distinguished throughout its career by its devotion to the scientific and artistic side of photography.

The early numbers contained 12 pp. each; the present issue has 16pp., with frequent illustrations. The value of a perfect set is considerable—over £20—but the purchaser becomes possessed of a complete epitome of photography, past and present.

## PORTRAIT CLUBS.

### HOW TO START AND MANAGE THEM.

BY C. BRANGWIN BARNES.

DURING the last two or three years portrait clubs have been largely growing in popularity with a certain class of the British public; and consequently, many photographers, who until recently had set their faces hard and fast against them, have felt themselves compelled to regard them with some amount of favour; and in cases where businesses have shown signs of falling off, or where an increase of custom has been desired, they have even gone so far as to introduce the systems of clubs themselves. The kind of portrait club to which I specially refer is not that in vogue with one or two firms, who introduce to the notice of the public at large, through the medium of an army of canvassers, a large portrait, said to be an oil painting, framed in a German alhambra moulding, with which twelve cards or six cabinets are presented gratis; but a club worked without canvassers, properly so called, on the same system as a watch club or a building society.

The firm wishing to introduce this method of business, usually enclose a circular, or preferably a neatly printed card, when sending home orders to any sitters whom they consider likely to become agents, preference being given to young men or women employed in large business houses. The card runs something in this style:—"Messrs. Camera, Lens, & Co., in returning thanks to their



customers for their past favours, beg to intimate that should any of them like to form portrait clubs, for cartes, cabinets, or larger pictures, among their friends, Messrs. C. L. & Co. will be pleased to supply them with all particulars as to the formation and management of the same, and will be pleased to allow agents a liberal commission on each club so formed."

Many of their sitters reply to this circular, and are instructed as to their duties, which merely consist in obtaining a certain number of members to a certain club, in obtaining their weekly subscription of one shilling each, and handing over their subscriptions, when obtained, to the photographer, in exchange for a sitting order, which is balloted for each week amongst the members. A popular club is one for twelve cartes-de-visite, or six cartes and one cabinet, or three cabinets, or one imperial, at the option of the sitter, the sum paid being usually six shillings. In this case six members paying one shilling, or twelve paying sixpence, weekly, would constitute the club. The photographer would have nothing to do with taking the small weekly subscription, as the agent each week pays over the full amount for one sitter, and receives a sitting order in exchange. The commission usually allowed to the agent is one free ticket in each club, which he or she may use or sell at discretion. Of course the amount of money paid for a sitting may be varied by the different photographers running the clubs. I have merely mentioned six shillings as a guide. The sitting order is usually a ticket or card torn out of a book which reads much as follows:—

Duplicate.	Sitting Order.
No.....	No.....
No.....	Camera, Lens & Co.,
Name.....	Photographers,
Agent.....	5,148, Regent Street,
Agent's No.....	London.
	This ticket entitles Mr.....
	to a sitting for 12 cartes-de-visite
	portraits.
	Agent, Mr.....
	Available for six months.

It will be seen by this that two numbers are on each ticket, the first being the number of tickets issued, and the second being the number of tickets that the agent has had, and which are, of course, registered in another club book kept specially for that purpose.

It will be found that once clubs are started on this principle, their numbers go on steadily increasing, many who sit as members of one being ready and anxious to become agents themselves; besides which they need in no way interfere with the ordinary casual or connexion business done by the same firm. Agents are not advertised for beyond the insertion of the circular with the order, and if the club prices are lower than those charged to private customers, the latter are not aware of that fact, as the price list contains no mention of club prices whatever. I know of several businesses in London where clubs of this kind have been kept running for the last three or four years, and where many of the original agents are acting as such up to the present day, for having had one club, other friends are constantly cropping up who wish to join it, and so a second, and a third are formed, and so they continue. I have known an agent start a club half afraid of being unable to obtain the requisite number of members, and find at the end of a week that he had taken names enough for two clubs instead of one.

One great advantage of the system is the amount of ready money it brings in—money which is in every case paid before the sitting; and it will be found that fully one-third of the sitters do not use their orders until the limit of time allowed is very nearly expired, so that the photographer has not only ready money to go on with, but the interest on that money; which is, in my opinion, at least, far preferable to a credit business even at high prices.

Clubs might be worked, and undoubtedly in some instances are, for larger work on the same principle, but I would not advise the introduction of tea-board paintings into any business where they have not been before. They no doubt have their admirers, but their day is over, or nearly so. Let those who wish to add to their ordinary business try clubs, but let them be for photographic portraits only, and let those have equal care given to them throughout all the processes of their production, to that given to private sitters. They pay quite as well or better, and each good photograph going out is an advertisement not necessarily of the clubs, but of the photographer, for it is not every one who sees that picture that will be told it was taken in connection with a club.

With regard to children and animals it is the rule to make a small extra charge, which can either be paid through the agent, or preferably at the time of sitting. Vignettes, too, are usually charged extra, though they might very well be included in the usual price, as they are very rarely asked for by club sitters.

#### ON SO-CALLED "DEPTH OF FOCUS" AND "DIFFUSION OF FOCUS."

BY T. R. DALLMEYER.\*

In plane geometry a point is defined as that which hath position but no magnitude; a straight line is such, that any part will, however placed, be wholly on any other part, if its extremities are made to fall on that other part; and a plane is a surface in which any two points being taken the straight line which joins them lies wholly in that surface.

I mention these three definitions to make clear what I wish to

Fig 1.

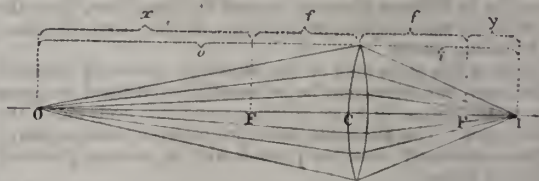


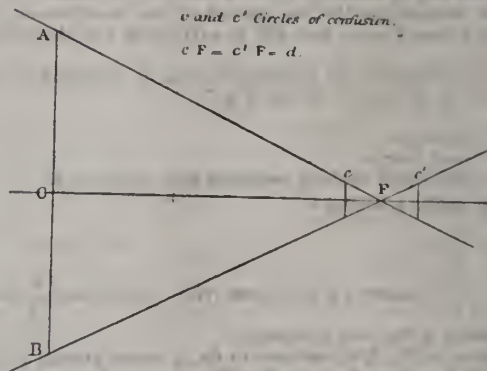
Fig 2.

$AB = a$  or aperture.

$CF = f$  or focus

$c$  and  $c'$  Circles of confusion.

$cF = c'F = d$ .



describe as an ideally perfect photographic instrument in so-called "depth of focus." If you will allow, in imagination, a point to be the section of a straight line, and let that point be the aperture of an imaginary pin-hole camera, then every point in whatever plane (near or distant) in the object would be represented by a corresponding point in the image upon the plane on which it

\* Read before the Photographic Society of Great Britain.



was received. In such a case you would have perfect depth of focus. In reality, however, with the pin-hole camera, because it is not a point, you obtain "diffusion of focus," but with uniform "depth of focus."

The object of my paper is to point out, in the first place, that absolute depth of focus in any lens, perfectly or imperfectly corrected for spherical aberration, does not exist at all; secondly, to explain clearly what is meant by so-called "depth of focus," in the ordinary acceptance of the term, and a method of calculating it for any lens; thirdly, the meaning of "diffusion of focus" with its bearing on so-called "depth of focus."

First. Absolute depth of focus does not exist in any lens. There is a well-known law in optics, known as the "law of conjugate foci," with which I anticipate you are all well acquainted; but as I shall have to refer to this again, I will call your attention to figure 1 for a moment. Any one point in a given plane in the object O can only be absolutely defined by one corresponding point in the plane of the image I determined by the distance of the object from the optical centre of the lens, and the focal length of the lens employed. Object and image are interchangeable; but however little the plane of the object be changed in position, either nearer to or further from the lens, there must be a corresponding change in the plane of the image, *i.e.*, further from or nearer to the lens, respectively.

To determine these positions definitely, I think one of the most ready and practical uses of the law referred to is the one I have given in the "Choice and Use of Photographic Lenses." When the focal length of the lens and the distance of the object from the lens on one side in terms of the focal length are known, the conjugate focus is distant the reciprocal of that number of times the focal length from the principal focus on the other side, *e.g.*—

$$\text{If } x = n f, y = \frac{1}{n} f, \text{ \&c.}$$

$$x y = f^2.$$

Hence it is impossible to focus absolutely two separate points of the object in different planes at one and the same time, upon the one plane for the reception of the image, in this particular case, the focussing screen.

Points in one plane only of the object are perfectly rendered in the image, but others may be sufficiently well defined to appear sharp at the normal distance of vision; and this leads me to the second point. This allowable difference between absolute sharpness and apparently visual sharpness is what is commonly termed "depth of focus."

It is generally granted that a circle of confusion of  $\frac{1}{100}$  inch in diameter is sufficiently small when viewed at the normal distance of vision (say 12 to 15 inches, or subtending an angle of less than one second of a degree), to be practically sharp, and it is upon this assumption that the tables published in the "Choice and Use of Photographic Lenses" were calculated. I will now explain, as simply as possible, how these figures are arrived at, and give simple formulæ for calculating—

a. The nearest point in the object for any lens beyond which every point will be sufficiently well defined or "in focus."

b. For determining the distances of objects on either side of the point focussed upon, that will be sufficiently well defined in the image.

a. As before stated, the permissible circle of confusion is not to exceed  $\frac{1}{100}$  of an inch, or (see Fig. 2).

If—

$a$  = aperture.

$f$  = focal length.

$d$  = distance of circle of confusion from  $f$ , or =  $c f$ .

Then, by similar triangles—

$$\frac{a}{f} = \frac{c}{d};$$

or  $c = \frac{a}{f} d$ , where  $c$  is a constant (*viz.*,  $\frac{1}{100}$  inch) and  $\frac{a}{f}$  (or the intensity of the lens) is known.

Referring to Fig. 1, all we have to do,  $y$  being known, is to find  $x$ . It is evident that  $y = d$  is this case, and hence

$$y = \frac{1}{100}''$$

$$\frac{a}{f}$$

Substituting  $R$  for  $\frac{a}{f}$ , or the intensity, then

$$y = \frac{1}{100} R$$

But—

$$x y = f^2$$

$$\therefore x = 100 R f^2 \text{ inches,}$$

And hence the distance sought, *viz.*—

$$x + f = 100 R f^2 + f.$$

Take a simple example, to illustrate this, before proceeding. Focal length of lens = 6 inches, working at an intensity  $\frac{1}{10}$ .

$$\text{Here—} \quad R = \frac{1}{10}$$

$$f = 6$$

$$\text{Hence—} \quad x = 100 R f^2$$

$$= 360$$

Or the distance sought—

$$x + f = 366 \text{ inches or } 30\frac{1}{2} \text{ feet.}$$

From this it is apparent already that greater depth of focus in a lens can only be obtained by loss of rapidity. The depth varies inversely as the diameter of the aperture, but the exposure requires to be increased by the square of the corresponding gain in depth, *e.g.*, twice the depth can only be obtained by four times the exposure; and, again, the depth varies inversely as the square of the focal length. This disposes of the first and simpler head.

b. To determine the distances of objects on either side of a given point that will be sufficiently well defined in the image, or the depth of focus on either side of the point focussed upon.

This explanation is given for application to portrait lenses, more especially where the ratio of aperture to focus is large, and the distance of the nearest object inconsiderable.

Proceeding as before—

The distance of the object =  $x + f$  ( $x$  and  $f$  are both given); hence  $y$  is known for since

$$x y = f^2$$

$$y = \frac{f^2}{x}$$

Then, for a given distance of object (see Fig. 1)—

$$\frac{a}{f + y} = \frac{c}{d};$$

$$\text{Or,} \quad d = \frac{c(f + y)}{a}.$$

The two new values of  $y$ , say,  $y_1$  and  $y_2$ , are

$$y_1 = y + \frac{c(f + y)}{a},$$

$$y_2 = y - \frac{c(f + y)}{a};$$

Or,

$$y_1 = \frac{f^2}{x} + \frac{c\left(f + \frac{f^2}{x}\right)}{a},$$

$$y_2 = \frac{f^2}{x} - \frac{c\left(f + \frac{f^2}{x}\right)}{a};$$

$$y_1 = f \frac{\{a f + c(x + f)\}}{a x},$$

$$y_2 = f \frac{\{a f - c(x + f)\}}{a x}$$

From these quantities,  $y_1$  and  $y_2$ , to find the values  $x_1$  and  $x_2$ , which are the quantities required—

$$x_1 y_1 = f^2 \text{ or } x_1 = \frac{f^2}{y_1},$$

$$x_2 y_2 = f^2, \text{ or } x_2 = \frac{f^2}{y_2}$$

$$x_1 = \frac{f^2}{f \frac{\{a f + c(x + f)\}}{a x}} = \frac{f a x}{a f + c(x + f)}$$

$$x_2 = \frac{f^2 a x}{f \{a f - c(x + f)\}} = \frac{f a x}{a f - c(x + f)}.$$

For depth in front of object,  $x_1 + f = f + \frac{f a x}{a f + c(x + f)},$

„ behind „  $x_2 + f = f + \frac{f a x}{a f - c(x + f)};$



Where  $a, f, x$ , and  $c$  are all known, or can be written, by substituting  $R$  for  $\frac{a}{f}$  and  $(\Delta - f)$  for  $x$

Depth in front or behind the point of focus

$$= f + \frac{f^2 R x}{f^2 R + \frac{1}{100} \Delta (x + f)},$$

Expressing  $\Delta$  = distance of object.

Depth in front = difference between  $\Delta$  and

$$f + \frac{f^2 R (\Delta - f)}{f^2 R + \frac{1}{100} \Delta} \quad (2)$$

Depth behind = difference between  $\Delta$  and

$$f + \frac{f^2 R (\Delta - f)}{f^2 R - \frac{1}{100} \Delta} \quad (3)$$

*Example.*—Take a lens of 15 inches focal length, intensity  $\frac{1}{4}$ , and let distance of object focussed for be 24 feet. To find the depth of focus in front of and behind the point focussed upon. Here

$$\Delta = 24 \text{ feet, or } 288 \text{ inches.}$$

$$f = 15 \text{ inches.}$$

$$R = \frac{1}{4}.$$

Substituting these values in equations (2) and (3), we get—

$$\text{For depth in front} = 15 + \frac{\frac{225}{4} + 273}{\frac{225}{4} + 2.88} = 274.7.$$

$$\text{For depth behind} = 15 + \frac{\frac{225}{4} + 273}{\frac{225}{4} - 2.88} = 302.7.$$

The distance of object focussed for was 288 inches. Hence

$$\text{Depth in front} = 13.3 \text{ inches.}$$

$$,, \text{ behind} = 14.7 ,,$$

Now, as it is evident from these results (equations 2 and 3) that depth of focus or permissible indistinctness is entirely dependent upon focal length and ratio of aperture to focal length, it follows that, in comparing lenses of identical foci and intensities, it is absurd to speak of one having more depth of focus than another, if both are perfectly free from spherical aberration, and used under the same conditions. However, I would point out that other defects, particularly curvature of field, are very misleading to photographers generally, and in judging the capabilities of lenses, may have led them to ascribe greater depth of focus to one lens as compared with another, even when examined under similar conditions.

Thirdly and lastly, I wish to explain the meaning of diffusion of focus and its relation to depth of focus.

At the commencement of my paper I spoke of a pin-hole as giving diffusion of focus with uniform depth of focus, resulting from the fact that no one point in the object is represented by one point in the image, but by a small circle, and the resulting picture is produced by a number of these small circles running one into another, and if the aperture can be made sufficiently small, a presentable picture is obtained.

Diffusion of focus in a photographic lens is produced by a certain amount of outstanding positive spherical aberration. This has been explained on many previous occasions; but I hope you will excuse the repetition, as I wish to demonstrate clearly the advantages that do exist when a certain amount of

Fig 3

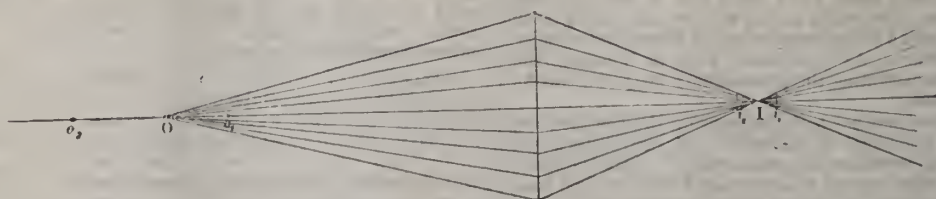
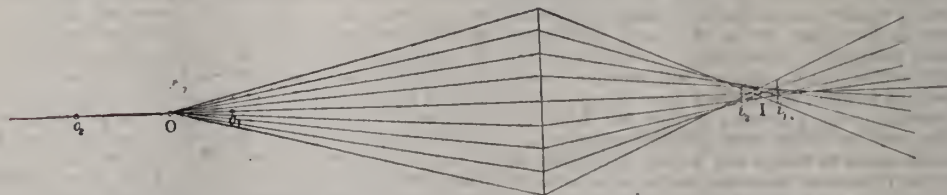


Fig 4



outstanding positive spherical aberration is obtainable in portrait lenses of great intensity. I purposely use the word "obtainable" in the sense that no lens of any practical utility should be sent out by an optician, no matter for what purpose, with inherent positive spherical aberration; but there are distinct advantages in employing a lens for portraiture where the spherical aberration referred to as obtainable can be regulated, produced to a definite extent, and reproduced again at will. As before stated, a point in the object can only produce a definite point in the image if the lens be entirely free from spherical aberration; but if the subject chosen be such that the circumstances under which it is to be photographed render it impossible to work within the limits of indistinctness permissible, to produce a general and equal sharpness throughout the whole of that subject, then the advantages of the introduction of positive spherical aberration to produce a general equality of indistinctness are apparent, and moreover exceedingly valuable in the hands of an artist.

To make this clearer, suppose fig. 3 to represent the reproduction of an object O at the image I in a lens entirely free from spherical aberration. The point O will be reproduced by a point at I. Suppose it necessary that two other points in two other places O<sub>1</sub>, O<sub>2</sub> on either side of the object O should be in focus, it is apparent that in the image they must be produced by two

circles of confusion i<sub>1</sub> i<sub>2</sub>, considerably out of focus. On the other hand, fig. 4, O being the same object, and I the sharpest possible image produced by a lens possessing a certain amount of positive spherical aberration, a small circle of confusion will be produced at I, two similarly situated points on either side of the object O, namely O<sub>1</sub> and O<sub>2</sub>, will produce two other circles of confusion i<sub>1</sub> i<sub>2</sub>, similarly to the lens entirely free from spherical aberration. Comparing these two cases, I contend, and I think it is evident, that for artistic and pictorial effect, as in portraiture, that the extreme contrast between absolute sharpness and confusion of image in the first case, as compared with the general softness or equality of indistinctness in the second, must be apparent. In the former case there must be a lack of harmony, and the resulting picture must be as incongruous in tone and effect as would be a portion of the careful work of one great artist, such as Meissonier, placed in the centre of a work by a wonderful impressionist, such as Velasquez!

#### TRANSFERROTYPE.

BY W. M. ASHMAN.\*

I HAVE compiled a short paper, which, if uninteresting as a sub-

\* Read before the London and Provincial Photographic Association.



ject for raising discussion, is the first paper, I think, which has been given before any society treating of "Transferotypes," as it has been thought fit to style them. I make no attempt to support the title chosen by the manufacturers as being specially suited to this class of product, for when employed as *glacé* prints no transfer is made. Again, transfers (possibly collodion transfers) and single or double transfer papers, have each and all become very familiar to the photographic ear. It can hardly, one would think, be of advantage to associate this useful process with the ferrotype, now dying a lingering death after a long and arduous struggle for a position in commercial photography which it was never permitted to attain. No, there is not any connection between any of the processes named and the so-called "Transferotype."

Briefly stated, this latter style of photographic production is a positive obtained by the gelatine bromide process, and I think we may presume that a stoutly made and good quality paper has received a coating of soluble gelatine by way of substratum, and upon the paper so prepared is spread a less soluble and perhaps a thinner layer of sensitive emulsion composed of silver bromide alone, or mixed with chloride or other haloids suspended in nearly colourless gelatine. Precise details and proportions I do not propose to enter upon, the formulae being a trade secret, and of little use to any but those able to coat large quantities of paper successfully. We may as well, for all practical purposes, rest content with the assumption that an outline of preparation has been touched upon rather meagrely, it is true, and that if not absolutely correct, sufficient has at all events been mentioned to indicate to photographers curious to know more of the process than that of name, what is likely to be the nature of the manipulations they would have to encounter in practice. Now these are very simple, and, like printing by development on other silver bromide papers, needs but a single trial to convince even the tyro how easy photography is, and what an astonishing result can be secured with a slight expenditure of labour and wonderfully little experience. As I proceed I hope to illustrate this statement by demonstrating the practicability of the process for decorative purposes.

The paper I have here has been prepared by the Eastman Dry Plate and Film Company, of Rochester, N.Y., and a developed image thereon can be utilised in various ways. It may be transferred from its paper support to almost any flexible or rigid base, as, for instance, polished or ground glass, porcelain, wood, prepared canvas, ivory, or, indeed, any substance not appreciably affected by hot water used in the stripping process. Metallic surfaces carefully polished, silver, gold, and other ornaments are well suited to receive the transfer, and need not of necessity yield images lacking vigour from an absence of underlying whiteness to give power to the lights. It is, of course, understood that direct contact printing or reproduction by means of the camera are each available, but to-night we will, for convenience, adopt the easiest (the former), and expose a piece of paper under a negative for one minute at a distance of four feet from the gas burner. This done, we shall, after soaking the paper for a few seconds in cold water to flatten and soften it, develop an image thereon by any favourite developer, and as soon as sufficient detail for our purpose is visible in the lights of the picture, further developing action is stayed, and the usual processes of fixing and washing follow. Alum clearing solutions after development and fixing have to be avoided in consequence of the tanning action alum has upon gelatine, and if this were to be permitted at either of these stages the soluble gelatine substratum might prove to be insoluble, and remain most tenaciously on its paper support.

An exposure is now made of one minute to the gas jets, and we will proceed to develop in the dark room, but before doing so will, with your permission, finish the remainder of this communication.

**Development.**—Alkaline carbonates in conjunction with sodium sulphite and pyrogallol may be used if preferred, but a blacker image results from ferrous oxalate. The formula recommended by the manufacturers is composed as follows:—

No. 1.—Oxalate of potash	...	...	...	1 lb.
Hot water...	...	...	...	48 ounces
Acetic acid	...	...	...	3 drachms
No. 2.—Ferrous sulphate...	...	...	...	1 lb.
Hot water	...	...	...	32 ounces
Acetic acid	...	...	...	$\frac{1}{2}$ drachm
No. 3.—Potassium bromide	...	...	...	1 ounce
Water	...	...	...	32 ounces

These solutions are stocked separately, and mixed in the following proportions immediately before use, and in the order recited:—

No. 1	...	...	...	...	3 ounces
No. 2	...	...	...	...	$\frac{1}{2}$ ounce
No. 3	...	...	...	...	15 minims

After exposure the print is soaked in a dish of cold water until flat; the water is replaced by developer, and the action watched until the shadows are judged to be sufficiently strong in depth, when the developing solution is quickly replaced (without a preliminary washing) with water acidified as follows:—

Acetic acid	...	...	...	...	1 drachm
Water	...	...	...	...	32 ounces

It is a good plan to change this solution once or twice, after which the prints are fixed in sodium thiosulphate, washed for an hour or so in running water, and are then ready for transfer to some other surface. This may be opal, or, indeed, almost any substance unaffected by hot water; hence if we mount an image on a wood block, it is of the greatest possible use to an engraver; if on clear glass, we get a transparency well suited for the lantern, or by similar means positives suitable for negative reproduction, or window decoration can be made, the difference of manipulation being merely one of varying the length of exposure and development. Plaques, tiles, enamel plates, all kinds of china ware, &c., can without any difficulty be thus pictorially ornamented by photography; so also may gold, silver, or many other surfaces, provided such are previously cleansed from grease. Even surfaces which under ordinary circumstances might be expected to repel the gelatine film as the process of drying proceeded, can by the employment of a gelatine substratum rendered partially insoluble with chrome alum be rendered amenable to our purpose.

Perhaps some of our members now present may object to the process, on the score of the image being reversed to that of positives by some other processes from the same negatives. To any such, I beg leave to remark that there are means by which such a difficulty, if difficulty it be, can most assuredly be overcome. I will not say much in favour of a reversing mirror, on the ground that we may assume the negatives have previously been taken in the ordinary manner for other purposes; therefore, any such suggestion must necessarily be out of place, and for the like reason, it would be idle to suggest that exposures be made on sensitive plates, reversed in the dark slide, as recently advocated by my friend H. J. Burton, for correcting reversed images in working that very simple and beautiful process, that of carbon by single transfer. Not only can we utilise single transfer paper in the present instance, however, to gain our ends, but antotype flexible support also, and it is extremely probable that the manufacturers of the Eastman Co. "Transferotype" may now hear this fact for the first time. A developed, fixed, and washed "Transferotype" can be laid down on a waxed and collodionized glass plate; and, if stripping has taken place, single transfer paper may afterwards be squeezed thereon, and when dry, will leave the glass with a high polish, a *glacé* print, in fact, with a fresh backing; so also may a preliminary mounting on flexible support be effected, and if the ordinary manipulations advised for the working of this special paper in the carbon process be adhered to, a gelatino-bromide positive by double transfer will be the result.

Personally, I see no necessity for re-reversing an image, and am quite content with the first transfer, which is effected in the following manner:—The print, well washed, is squeezed upon whatever surface has been chosen for its reception, said surface being cleaned or otherwise prepared previously, if necessary. Pressure is then brought to bear upon the two surfaces, which, if flat, is best effected by placing under a heavy weight. In any case a wait is necessary before further progress can be made, and the period of waiting may be any time between half an hour and half a day. Contact fully established, the object to be embellished and the adhering transferotype print are subjected to water of not less than 140° F., or more than 160° F. Pretty soon the soluble gelatine substratum will give way, and the paper support can be removed without injuring the positive image which lies on the surface of the object intended. Washing in slightly warm water and hardening in alum are now admissible, after which a final washing is given, the print may afterwards be dried and further treated by painting, varnishing, &c.



### Notes.

That amusing journalist, "Luke Sharp," is now writing in a serial form a narrative of adventures in Belgium, and those who read "Jones and Son," as the story is called, will have gathered that the author must be an enthusiastic amateur photographer. His camera, with its patent Alpenstock-like tripod, has, indeed, already landed the hero of the tale in a series of misunderstandings with the Belgian police which photographers with a desire for foreign travel will readily appreciate and sympathise with.

W. P. Frith attacks the Impressionist school with vigour in this month's *Magazine of Art*, and remarks that the "Absurdity is carried to its utmost pitch in some of the illustrated papers, in which an angular form, with dots for eyes, a few scratches for body, and a few more in the place of legs, is served up to the public as the impression a human being has made on some great genius." There is a good deal of truth in this. Taken as a whole, the style of drawing just now in some of the periodicals is excessively ugly, the scratchy method in particular. Whatever the artist may intend, the result is as though his figures had been dipped in water. His outlines are feeble, his drapery is almost destitute of form, and when he attempts a fold, it looks as if he had studied from a model dressed in glazed lining. We fancy the facilities which photography offers for illustrating periodicals cheaply have something to do with this. Formerly the style was settled by the engraver. Whether the artist drew wholly in pencil, or whether he used a wash, the translation was made by the engraver in his own way. Now the artist is left entirely to his own resources, and hence the good, bad, and indifferent pictures which flood the illustrated papers. What is wanted is a school of art which shall teach the best style—not only to meet the requirements of photography, but to produce an effect equal to that of the old wood block. At present the firmness and solidity of wood-engraving have not been approached by the artist on card.

Talking recently on this subject with the editor of an illustrated paper, he told us that in changing from wood to "process" he found some of the "wood men" at first very much at sea. In one case where the artist used to trust to the engraver to make good his shortcomings, the result was disastrous. Very often the engraver, in order to protect himself, would bring a block to show the editor how wrong the drawing was: "Because," said he, "if I cut it exactly as Mr. — has drawn it, you may blame me." The truth was, this particular artist was indolent and careless, and when he had no friendly engraver to correct his faults, he came hopelessly to grief. Notwithstanding that photography reproduced his errors, he kept on in his old course, and at last his services had to be dispensed with. This is a case in which photography was the cause of a man's downfall; but the fault was not with photography, but with the artist, who was not wise enough to accommodate himself to altered circumstances.

It is well known that successive Chancellors of the

Exchequer have been repeatedly asked by persistent correspondents to put a tax on photographs. But they have fortunately and wisely, as we think, refused to listen to this insidious suggestion to put on an impost which would be in effect a tax upon light. Mr. Goschen has, indeed acted on the well-known proverbial warning in refusing to put the *carte* (for taxable purposes) before the horse. Let us hope, though, that his choice of the horse this year will not necessarily imply his selection of the *carte* next April, as the object of his financial attentions. And there is, at any rate, one reason for supposing it does not: Mr. Goschen, though he may not know a horse from a cow, as Mr. Chaplin so politely puts it, must know enough of photography to be aware that when *cartes* are taxed, the "Cabinet" itself cannot hope to escape!

A contemporary has just published the details of a New York dinner party at which the electric light was actually introduced into the heart of a jelly. The effect when the cover was at last removed which had concealed this "surprise" dish from the guests' sight is said to have been quite sensational, not to say electrifying. Now this novel use of electricity took place at the festive board of a well-known New York millionaire whose wife has lately come to the front as an enterprising leader of fashion. And to this same lady, it seems, is due a novel use of photographic portraiture as an adjunct of the dinner-table, which may not improbably become popular. It was this. At a dinner party given by her, the numerous guests, on filing into the dining-room, found that their respective seats at the table were identified, not by means of written cards, but by tastefully framed photographs of themselves. Everyone, in fact, was enabled without much trouble to find his or her photographic portrait; and it is stated that these likenesses served a double purpose: not only did they assist in the speedy appropriation of the chairs by the guests, but when these guests were seated, the photographs, it was found, furnished a most fruitful topic for conversation, helping, indeed, to break the ice, and to start the social voyagers on the conversational sea in the most successful manner.

Civilisation is progressing. "I see you are sending a consignment of goods to Central Africa," said a man who was lounging in a merchant's office the other day. "Glass beads, looking glasses, and gaily-coloured handkerchiefs, I suppose, eh?" "Good gracious, my dear fellow," exclaimed the merchant, "we have long since passed that stage of ignorance. You've no idea how the natives have advanced. Why, I'm sending out cheap amateur photographic outfits. The niggers are mad on photography." Whether this merchant was fond of joking, or whether he wanted to send his visitor away with something to talk about, we are unable to say.

Mr. Chamberlain has been rewarded for his recent services by receiving a portrait of the Queen, which is reported to be enriched by an inscription in Her Majesty's own handwriting. We have it, from what we take to be a reliable source, that the portrait sent is one of those issued with the YEAR-BOOK OF PHOTOGRAPHY, but shall be



pleased to correct this statement should we be assured by a really unquestionable authority that it is incorrect.

The photographic portrait issued with the YEAR-BOOK is, we believe, the only real (untouched) photograph of the Queen ever issued.

## Reviews.

DIE RETOUCH PHOTOGRAPHISCHER NEGATIVE UND AB-DRUCKE. Von Professor H. Mücke, Düsseldorf. Ed. Liesegang's Verlag. Demy octavo, 200 pages. Numerous illustrations. Price not stated.

DR. LIESEGANG, in issuing this comprehensive work, has added to the obligation which the photographic art already owes to him. Not only do we find the usual routine of retouching work explained, but also an account of the Air-brush, a chapter on the Anatomy of the Face, and a fullish treatise on the Colouring of Photographs. For completeness, it is far in advance of anything hitherto published.

## SILVER-GOLD PRINTING BY DEVELOPMENT.

BY E. HOWARD FARMER, F.C.S., F.I.C., AND H. KNEEBONE TOMPKINS, B.Sc.\*

IN reviewing the progress which has been made in photography during the past ten years, it is apparent that whilst a complete change has been effected in the method of obtaining negatives so that the photographer is comparatively independent of the amount of light at his disposal for this purpose, yet the method of printing, by which at least nine-tenths of the positive prints are obtained, remains the same as that in vogue forty years ago, with the result that during the dull weather—of which we in England have so large a share—the photographer is compelled to keep his clients waiting one, two, or three weeks before completing their orders.

We think it will be conceded that this loss of time is a great detriment to business; but, notwithstanding this, very few, if any, serious attempts appear to have been made to effect in positive printing what has been done so well for negative taking.

Some time back it occurred to us that a careful investigation of the subject would reveal a method or methods by which this delay could be overcome, and, after some preliminary experiments, it became evident to us that the emulsion method, which has given such valuable results in the negative process, was also the method to employ for getting over the difficulty; and experience has confirmed this.

At the present stage of our work, we are acquainted with at least four distinct emulsion processes by which prints similar to those on albumenized paper can be obtained, but more expeditiously. These are—

1. An albumen process for printing out from four to eight times as sensitive as the ordinary method.

2. A rapid albumen process for printing by development and also giving prints identical in appearance to ordinary albumen prints.

3. A very rapid gelatine process for printing by development.

4. A collodion emulsion process for printing out and for development.

As may be gathered from the title of the paper, we have the honour to bring to your notice "Silver-Gold Printing by Development."

It is the second of these processes we propose to demonstrate this evening, as it is the one to which we have given the largest attention; but before proceeding with the process we should like to explain why we call it silver-gold printing.

At a very early stage of our inquiry we found that ordinary or so-called silver prints—i.e., albumen prints, at any rate as far as their permanence, beauty, and colour are concerned—are very much more gold than silver prints [a print was passed round from which the silver had been removed], and in our process, although the reduced silver compound is probably in a more stable condition than in an ordinary print, the gold when

it is required to print the exact photographic tint is equally important. Hence, to distinguish it clearly from the bromide paper process, which is truly silver-printing by development, and as the gold is equally important for our process as for albumen prints, we term it silver-gold printing by development. We were aware at starting of other processes for obtaining albumen photo tints by development. Examples:

Hardwicke's process. In this process salted albumenized paper is floated on weak silver nitrate, and developed by acid development.

Mr. Wilkinson's process.

Mr. Wm. Brook's collodion emulsion.

Commercial gelatine papers.

Doubtless emulsion processes.

We carefully examined these processes alongside preparations of our own, including both bath and emulsion methods, with the following results:—

That in no case were we able to obtain anything like the brilliancy and purity of surface colour so characteristic of ordinary prints, but that along with the development of the red compound of silver there was always a tendency to a muddiness or fogging of tone when examining the results by reflected light.

And here we wish to draw attention to the remarkable differences in result given by these processes when examined by transmitted and reflected light respectively, a point which we believe has not formerly been noticed. That whereas it was comparatively easy to obtain gorgeous hues by transmitted light, yet in proportion to this gorgeousness by transmitted light the prints were dull and muddy by reflection, and in many cases when the colour by transmitted light was weak and dull the reflected colour was brilliant and vigorous [examples were passed round].

There appeared to be three explanations of these contrary effects:—

1. The reduced compound was dichroic, or in other words reflected rays complementary to those transmitted, a compound in fact similar in properties to that which gives pink and green fog in dry plates, and in many cases the appearances obtained made this theory appear the correct one.

But an ordinary print is red both by transmitted and reflected light, and we considered and do consider that the red compound obtained by development is practically the same substance as that produced by light, and therefore that what was done by the one was possible also by the other. Our experiments have confirmed this.

There is, it is true, in ordinary printing an effect sometimes obtained very similar to the one I have been describing. I mean what is called bronzing—when you get a greenish metallic surface by reflected light instead of the usual red, although by transmitted light the colour is bright red.

We can now, understanding more about the subject, obtain bronzing in the shadows by development identical in appearance to that produced by exposure.

II. A second possible explanation was that the want of surface colour was due to the image not being sufficiently on the surface of the film, as by development one can readily understand that the image would have a greater tendency to extend through the thickness of the film than by simple exposure.

A modification of this theory was want of homogeneity in the film, or of exposure of the sensitive salt to light, a plausible explanation from the fact that collodion films give the muddiness in an extreme degree. A great many experiments were made on the basis of this theory and its modification, with the result that while demonstrating the importance of keeping the image on the extreme surface of the film, they did not confirm it as an explanation of the difficulty.

III. A third explanation which occurred to us was that the two actions were separate and distinct from one another; that is to say, two actions went on during development, one giving the red colour and the other the muddy colour, and experiment has confirmed this theory.

Amongst others we made and confirmed the following observations bearing on this point:—

1. That the colour was usually red at the early stages of development, and then passed into the muddy stage.

2. That if the development was prolonged, the image became muddy by transmitted light as well as by reflected light.

3. That the longer the exposure the further could the development be carried without getting the muddiness, but (as a note to this observation) an over-exposed appearance was at the same time given to the image.

\* Read before the Photographic Society of Great Britain.



4. That salts, such as soluble chlorides, bromides, citrates, &c., added to the developer acted powerfully in retarding the appearance of the muddy stage, and also counteracted in great measure the over-exposed appearance previously mentioned.

5. That neither the red colour nor the muddy colour were distinctly marked stages of development, but that the colour was first a light yellow, and gradually darkened as the development proceeded.

We believe that Mr. W. H. Burton and others have made similar observations.

From the first of these observations, that the muddiness came at the end of development, we concluded that the muddiness in development is the analogue of bronzing in ordinary printing, and we further concluded from its appearance and from analogy that the muddiness was due to a portion of the film being reduced to metallic silver, or a very low sub-compound a [print was shown developed half red and half green]. Moreover, we found that the development could not be kept at the red stage, but usually passed into the dark or muddy stage. With a long exposure the image was weak and red, with a short exposure the image was more vigorous, but passed into the dark stage. This even held good with a large quantity of restraining substance.

6. We finally observed that even when the red colour was obtained it had the drawback of disappearing almost entirely in the fixing bath, the residue being of a bright mustard-yellow colour, quite unsuitable for the production, in conjunction with gold, of the ordinary photographic tone. In connection with this observation we obtained the interesting result that the shorter the exposure with which the red colour could be obtained, the more perfectly it withstood the fixing bath.

It appeared apparent from the effects described, that if during the development the appearance of the muddy or dark deposit could be prevented or lessened, a much more successful result could be obtained; for obviously a shorter exposure being given, the image would be bright and vigorous as well as red, and at the same time much less, if at all, soluble in the fixing bath, and we experimented with this object in view with emulsions and preparations of various kinds.

Amongst the numerous salts of silver tried were silver chloride, bromide, citrate, phosphate, and carbonate. We found that with the haloid silver salts a red colour could generally be obtained if sufficient exposure were given, the strength of the developer being reduced in proportion. Also that, at least in the case of silver chloride, the state of aggregation of the sensitive compound had very little influence on the colorific effects, grey digested chloride giving a colour only slightly darker than that of the undigested salt.

Of the remaining salts the citrate gave a yellow-red image, whilst the phosphate gave a not unpleasing sepia tint. This last salt has the peculiarity of not being fixable by hypo, but of being readily fixed by dilute ammonia or nitric acid, the print having in the latter case the appearance of a toned print. The carbonate gave a fogged image.

Amongst developers tried may be mentioned ferrous salts and pyrogallol, hydroquinone and some of the tannic acids in conjunction with ammonia, caustic potash and soda and their carbonates, and the hydrates of some of the alkaline earths.

The reducing agent employed has not much influence on the colour, the effect depending more upon the strength used. Difference of temperature of the developer had also very little effect except at temperatures below 37° F., when the development was arrested.

Various restrainers were used, viz., potassic chloride, bromide, and urtrite, ammonium oxalate, sodium acetate, potassic citrate, potassic chlorate, and salicylic acid.

We found generally that the more the developer was restrained the redder the colour, the general effect being, as might be expected, to increase the necessary time of exposure, time of development, and harshness of image, the particular restrainer used being unimportant.

Finally, we did not observe any distinct difference by exposure under similar conditions to different coloured rays.

We tried various substances for suspending the sensitive salts, viz., albumen, gelatine, gum, gluten, and collodion. No great differences were observed except such as were due to the mechanical differences of the substances; thus, albumen was obviously most suitable for prints, collodion developed and toned readily, whilst the gelatine preparations were the most sensitive.

We will now demonstrate the manipulation of the paper. This is made of two kinds, one with a matt surface, the other glossy [specimens passed round].

The paper is exposed under a negative in a printing frame in the usual way, from fifteen seconds to five minutes to diffused daylight, according to the state of the weather, being the necessary exposure. A faint visible image is produced, and this is a valuable guide, as the exposure is correct when all the details are just visible [specimens of exposed prints passed round]. The prints are then soaked in water and developed [development of prints shown]. The prints are then toned in any of the usual toning baths and fixed [specimens of fixed prints toned and untuned passed round].

In conclusion, we would draw your attention to some prints produced by this process, which we think are sufficient to show that it is possible to produce by development prints in every way equal to the finest silver prints in as many hours as are now required days, and to thus remove, in our opinion, the greatest hindrance under which the photographer labours.

## Patent Intelligence.

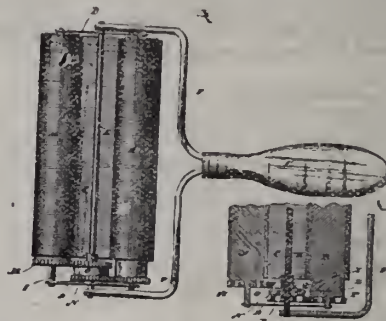
### Patents Granted in America.

375,820. CHARLES S. HOWLAND, Campville, Conn., for "Rubbing down device for mounting photographs."—Filed Oct. 3, 1887. Serial No. 251,318. (No model.)

*Claim.*—1. A rubbing-down device for mounting photographs, having two rolls, a strip of cloth attached to and wound upon them, and means, including a spring, for equalising their action, substantially as set forth.

2. A rubbing-down device for mounting photographs, having two rolls, a strip of cloth attached to and wound upon them, and gearing connecting them and including an equalising spring, substantially as set forth.

3. A rubbing-down device for mounting photographs, having two rolls, a strip of cloth attached to and wound upon them, a pinion attached to each roll, two independent pinions respec-



tively meshing into the pinions secured to the rolls, and a spiral spring coupling such independent pinions, and winding or unwinding to equalise the action of the rolls when they rotate at different rates, substantially as set forth.

4. A rubbing-down device for mounting photographs, having two rolls, two frame-pieces in which they are journaled, a shaft to which such frame-pieces are secured, a yoke carrying such shaft and provided with a handle, and means for equalising the action of the rolls, substantially as set forth.

375,912. LEO F. ADR, Waterbury, Conn., for "Photographic tray holder."—Filed Sept. 6, 1887. Serial No. 248,786. (No model.)

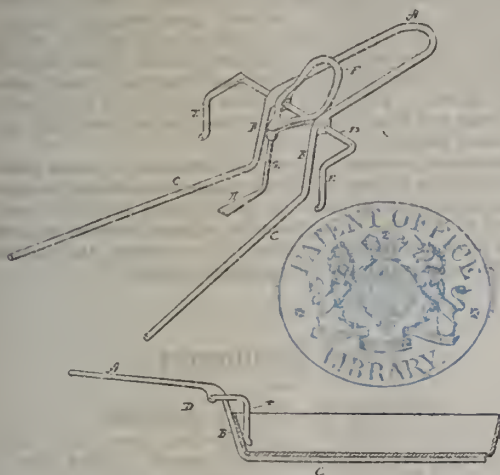
*Claim.*—1. The herein-described photographic tray holder, made from wire bent into U shape, the two legs in the same plane, and the two legs bent downward to form uprights B B, and thence turned horizontally to form the supports C C, combined with a transverse bar D, terminating in downwardly-projecting fingers E, substantially as described.

2. The herein-described photographic tray-holder, made from wire bent into U shape, the two legs in the same plane, and the two legs bent downward to form uprights B B, and thence turned horizontally to form supports C C, with a transverse bar D, terminating in downwardly-projecting fingers E E, combined with a lifter hinged in the handle portion of the tray-holder, one arm extending from said bar to form a thumb-piece, the other extending downward and terminating in a finger



adapted to rest upon the bottom of the tray, substantially as described.

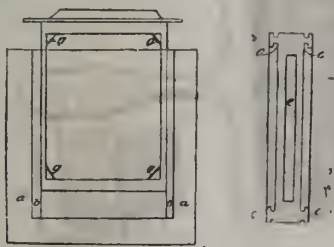
3. A holder having a handle and adapted to support a photo-



graphic tray, combined with a lever hinged in said holder, one arm extending upward to form a thumb-piece and the other arm extending downward and adapted to lie upon the bottom of the tray, substantially as described.

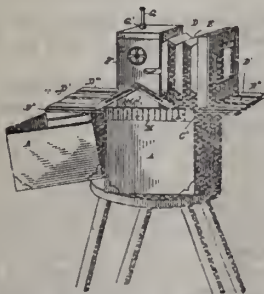
376,181. HENRY COPPIN, 58, St. Germans Road, Forest Hill, County of Kent, England. "Photographic plate-holder."—Filed Feb. 10th, 1887. Serial No. 227,093. (No model.) Patented in England Dec. 17th, 1886, No. 16,605, and in France, Jan. 6th, 1887, No. 180,729.

*Claim.*—1. In a photographic plate-holder, the combination of frame *a*, having slots *c c'*, with a carrier for sensitized plates which slides in slot *c*, and the two light-excluding panels *d*, which slide in slots *c'* on each side of said carrier, said panels being hinged, substantially as and for the purpose set forth.



2. In a photographic plate-holder, the combination of frame *a*, having slots *c c'* and grooves *b c*, with a carrier for sensitized plates which slides in slot *c* and grooves *b*, and the two light-excluding panels *d*, which slide in slots *c'* and grooves *c* on each side of said carrier, said panels being hinged, substantially as set forth.

376,798. JOSEPH A. DAVISON, Polo, Ill., for "Combined photographic camera and plate-holder."—Filed July 2, 1887. Serial No. 243,287. (No model.)



*Claim.*—1. The combination of the box A, provided with compartments C and ways C<sup>2</sup>, and the camera D, provided with fold-

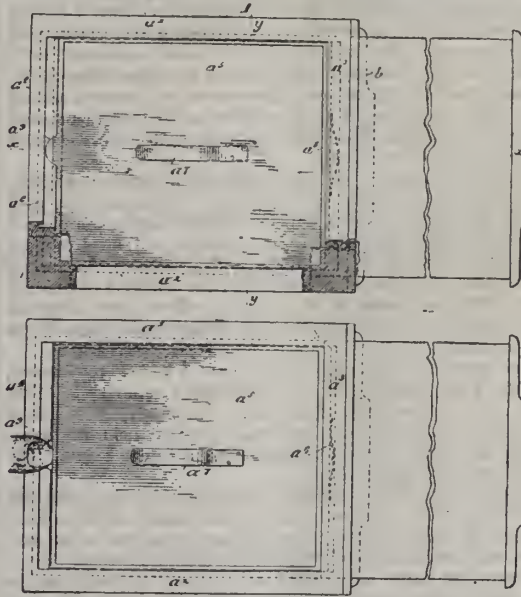
ing sides D' and the flanges D<sup>2</sup>, and also aperture D<sup>4</sup>, and means, substantially as shown, for drawing the plates B from the box A into the camera D when the latter is closed, substantially as shown, and for the purpose described.

2. The combination of the box A, provided with ways C<sup>2</sup> and compartments C, and engaging-marks H, camera D, provided with the folding sides D', flanges D<sup>2</sup>, slot D<sup>4</sup>, and pointers J, and means, substantially as shown, for drawing the plates B up into said camera through said opening D<sup>4</sup> and returning same, for the purpose specified.

3. The combination of the box A, provided with ways C<sup>2</sup> and compartments C, adapted to hold the plates B, the camera D and folding sides D', provided with flanges D<sup>2</sup>, adapted to be seated in and traverse said ways C<sup>2</sup>, said camera being further provided with a longitudinal slot, D<sup>4</sup>, adapted to admit the passage of the plates B, respectively, and means, substantially as shown, for drawing plates B from the compartments C in the said camera and returning the same, substantially as shown, and for the purpose described.

376,983. WILLARD H. FULLER, Passaic, N.J., assignor to the Scovill Manufacturing Company, New York, N.Y. "Photographic plate-holder."—Filed July 9, 1887. Serial No. 243,815. (No model.)

*Claim.*—1. In a photographic plate-holder, the combination of a frame composed of side and end pieces rigidly secured together, the end pieces being provided with flanges adapted to secure a photographic plate, one of said end pieces having a notch in its flange, the other of said end pieces having a spring arranged in a recess beneath or behind the flange, and both said



end pieces being closed beneath said flanges, and at the rear of the recesses formed thereby, substantially as specified.

2. The combination, with a photographic plate-holder, of a kit consisting of a thin frame having a central opening, corner pieces extending across the central opening upon one side of the kit, and buttons at the other side of the kit adapted to be adjusted over the opening, said kit being of such thickness only that when a photographic plate is arranged in said opening and between said corner pieces and buttons, the surface of the plate will be approximately flush with the surface of the kit upon both sides, substantially as specified.

## Correspondence.

### QUESTIONABLE CHARITY.

SIR,—It is to be regretted that the noble president of the new Amateur Charity Association and Mr Constantine were so shortsighted as not to notice that in starting their



novel idea they were engendering a scheme of utterly ruining numbers of respectable professionals.

I hope and trust that they will reconsider the matter, and if then they do not come to a different conclusion, will at least consent to let the proceeds flow into the coffers of the Photographers' Benevolent Association; for, even if it could not be demonstrated that the new society tends to ruin the profession, nobody can deny that it will inflict injury to it.

Charity begins at home, and if amateurs derive their pleasure from photography, it is reasonable that they should expend their gratitude upon the charities of photographers.

I believe the majority of bona fide amateurs (by which term I mean those who are not secretly aiming at joining the profession) will have little to do with the new concern if they are aware of the injury they are doing, and I doubt not that, should the profession find it necessary, for their own protection, to start an anti-charity driver's association, they will have the hearty co-operation of all amateurs who are clear-headed and honest enough to conceive and acknowledge the evil done. At any rate, Mr. Adcock, an amateur, well known and clever, deserves the thanks of the profession for his noble-heartedness and generous feeling, and, I am pleased to say, I am acquainted with many more equally well disposed. With their help and that of the firms it ought not to be difficult to combat the threatened danger.

Mr. Augustus Wilson has so ably demonstrated the fallacy of Mr. Constantine's ideas that little more remains to be said.

Owing to the facilities afforded to amateurs by the advent of the dry plate manufacture, professional photography has ceased to be as profitable as heretofore. It is natural that everybody with a love for art and science should long to become an amateur photographer, and those possessed of spare time and cash are continually swelling the ranks of those who each take a rose out of the professional nursery.

If Lord Grosvenor would condescend to argue with such beings as professional photographers, it would be interesting to hear his opinion; I should feel too proud to demonstrate to a real, live lord, with unassailable argument, that his is a mistaken idea, that in fact he is "robbing Peter to pay Paul."

When his Lordship innocently asks, "Are we injuring such men as Mendelssohn, Lafayette, &c.?" he proves he is incapable of reasoning beyond his own sphere, for I can give him the assurance that there are hundreds of photographers (administering to the wants of much less exalted personages) who are in no way inferior to these justly celebrated artists.

I am sure most photographers will uphold me in my view that they have, in the course of natural events, suffered through the amateur, and will be seriously injured should Lord Grosvenor and Co.'s speculation prove successful. If his Lordship is really charitable, let him courageously acknowledge his error; or, if he can, clearly explain away the fears of the craft.

J. HUBERT.

#### PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

DEAR SIR,—The Committee desire to ask your assistance in bringing under general notice the proposed "Orphan Fund" in connection with this Association, by the insertion of the following address in your next issue.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION PROPOSED ORPHANS' FUND.

When the gigantic proportions to which the photographic profession has now attained are considered, it cannot fail to excite wonder that, up to the present time, there has been no fund or provision of any kind specially designed for the help of the orphans of photographers. Other trades and professions, far less important than ours, have their almshouses, orphan asylums, and pensions. In photography, organised charity is represented solely by the Photographers' Benevolent Association, which, after

a long struggle with the neglect and coolness of the profession, is now doing good work for the benefit of the poorer members of the craft, their widows and orphans.

An anonymous donor, desirous of enabling this Institution to still further extend its useful and benevolent influence, has placed a sum of 20 guineas in the hands of the Committee as a first donation towards the foundation of an Orphan Fund, with the proviso that £500 are to be raised as a nucleus for such a fund within the present year.

The Committee is ready to make every effort to do this, but before in any way calling on the outside public for help, ask the profession and amateurs to show their interest in and sympathy with the scheme by sending donations or promises of assistance in other ways.

In short, photographers are now given an opportunity of shewing whether they will allow the destitute orphans of their brethren to remain recipients of private charity or relief under the poor law, or whether they will follow in the wake of the commercial travellers, musicians, teachers, printers, and many others, in providing a special fund and home by subscriptions amongst themselves and those immediately interested in the art.

To enable the Committee to know their precise position relative to this movement, those who intend supporting the same are urgently requested to notify the Secretary, with the least possible delay.

(For the Committee) H. HARLAND, Secretary.  
83, Hawksley Road, Stoke Newington, N.

#### DIFFUSION OF FOCUS.

DEAR SIR,—My letter to which Mr. W. E. Debenham replied in your last, was written with the one object of calling attention to a phase of this question that is generally neglected, although it is the most important aspect of the matter to the practical photographer. I not only avoided passing any opinion upon the theoretical or quasi-scientific statements that I could not exclude without destroying the sense of the quoted extracts, but I specially said that we were not bound to accept those statements in their literal fullness, meaning that whether we accepted or rejected them did not affect the question from that point of view which alone I was anxious to emphasise.

If bringing forward what one considers to be a neglected aspect of a question, maintaining at the same time a strict neutrality with regard to other considerations, is a want of candour, I must plead guilty to the charge which Mr. Debenham suggests in his letter. My express object, however, was to compensate in a measure for what may be called a want of candour on the part of those who take up the theoretical details of the matter to the total neglect of the practical side. To illustrate this point, at page 174 of the present volume, Mr. Debenham is stated to have said—and if my memory is correct he has made similar statements often before—"that by introducing spherical aberration the definition was lowered throughout." I consider that such statements are calculated to mislead as to the meaning of their author unless a *proportional* lowering of definition is intended to be understood, and I do not believe that Mr. Debenham thinks that the effect is proportional.

But the theoretical side of the question does not in any sense affect the only point that I sought to substantiate, namely, that whatever opinions one may hold, the valuable and important fact remains, that a large number, and probably a large majority, of those portrait photographers who have stood out conspicuously as exceptionally able artists, have highly appreciated instruments that possessed or would allow of the production of a certain amount of spherical aberration. I am as candid as I know how to be when I say to photographers, put this fact on one side, put on the other side any theories or anything else whatever that you may choose, and then do as you prefer.

It will doubtless shock some people to hear theories associated with opinions, and practical results with facts; but I have passed through, and I believe beyond, that mental condition that regards theories as facts, and practical results as matters of opinion.



If you will allow me, I will notice one or two points in Mr. Debenham's letter, though they only remotely affect the one point that I have endeavoured to emphasise.

Mr. Debenham says: "The expression, 'diffusion of focus,' is itself delusive and misleading." Now the optically perfect lens (a perfection sought after, but impossible to attain) gives a sharp representation of objects in one plane, and a blurred representation of objects in all other planes. But when spherical aberration is present, the focal point of the outer zone of the lens is separated a little from the focal point of the centre of the lens, and a point upon the principal axis of the lens instead of being reproduced as a point, is reproduced as a line upon the principal axis; the focal point is lengthened out, scattered, or diffused. I cannot conceive a better expression for this effect than "diffusion of focus," though I admit that the expression has not always been translated in this way, and that, like most verbal formulæ, it has led to some misunderstanding.

In the PHOTOGRAPHIC NEWS for 1867, page 22, J. H. Dallmeyer is reported to have said (in reply to Mr. Debenham), that "by reference to practical illustrations, he would find that by such diffusion objects in planes wide apart were defined better, not simply relatively, but absolutely." This is a distinct appeal to experiment, but J. T. Grubb combatted the statement on theoretical grounds, and with diagrams. Mr. Debenham has chosen to accept Grubb's doctrines rather than Dallmeyer's experiments. I will not pretend to judge between two such eminent opticians, but merely remark that it is a difficult question to settle by means of diagrams, because the circle of confusion is not equally illuminated when spherical aberration is present.

I do not see that Mr. Debenham's remarks in any way qualify what I quoted concerning Petzval's opinion in favour of the occasional usefulness of spherical aberration. Mr. Debenham suggests that Lake Price spoke in praise of Dallmeyer's diffusion of focus lenses because he had "been told that the lens possessed 'a certain power.' This is a gratuitous assumption which needs no reply from me.

In conclusion, Mr. Debenham talks of sharpness as if it were an absolute quality, and I think this is misleading. Photographic sharpness is only blurring or confusion reduced to a practically negligible amount. The most perfect of slow lenses with the smallest of diaphragms will give a very perceptible lack of sharpness towards the edges of its field. The most perfect lens will give its nearest approximation to sharpness only in the reproduction of one point out of a number of points at different distances from the lens. In photography, whether we will or not, we have more to do with blurring than with sharpness, and if a little variation in the nature of the blurring is found to be advantageous while the theory indicates that it ought to be detrimental, then, as I said before, it would be well to amend the theory.—I am, &c.,

CHAPMAN JONES.

#### DIFFUSION OF FOCUS.

SIR,—The correspondence on this subject in your columns leaves Mr. Dallmeyer in a position requiring extrication. In pamphlets published by him he treats of lenses "capable of adjustment for diffusion of focus as a means of securing depth of focus," and states that his patent lenses "afford the means, by the simple turning of a screw, of obtaining greater equality or depth of definition."

Mr. Debenham implies in your columns that the above statements are incorrect, and that "confusion of focus, partial destruction, or deterioration of focus," would be more correct than "diffusion of focus."

I suppose that the following statement of Mr. Debenham applies to the patent lenses of Mr. Dallmeyer, viz., "that greater distinctness in out-of-focus planes is not obtained

by sacrificing sharpness at the focus itself," and in fact by attempting to do so "sharpness is dimmed throughout."

It is not even to be inferred that Mr. Dallmeyer's patent lenses have the power of dimming the focus itself without further dimming the "out-of-focus planes." In fact, one is at a loss to see the advantage of the patent lenses over other lenses.

I purchased one of Dallmeyer's patent lenses, as others have doubtlessly done, in full confidence in his published statements. Either Mr. Debenham libels, or Mr. Dallmeyer is liable. I do not think that *caveat emptor* would relieve the latter.

I will own that if I were cross-questioned I should say that I believed, by experience, that the patent lenses in question have advantages of equalising focus, and that I do not regret my purchase; but I certainly should not have purchased the lens if the correspondence alluded to had previously appeared. So I think that Mr. Dallmeyer should now come to the fore.—Yours faithfully,

J. CHESTER JERVIS.

Place Charles Felix 1, Nice, April 2nd.

### Proceedings of Societies.

#### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

The technical meeting of this Society was held on Tuesday evening, the 27th ult., Captain ABNEY, Vice-President, in the chair.

F. W. DONKIN, the Hon. Secretary, showed an Ether Saturator on Ives's principle.

W. H. PRESTWICH handed round a printing frame for opals and transparency printing; a spring pressing against the edge of the negative held it in place against the opposite rabbit. The plate if of the same size, was held in a similar manner, but to accommodate smaller plates, there was a back covered with gutta-percha, by warming which it was stated that the plate could be fixed and maintained in any desired position against the negative. The two parts of the press were fitted together by three studs on the one part working into corresponding openings on the other half.

It was suggested by a member that gutta-percha soon loses its power of adhesion, and E. Clifton said that a good medium for the purpose would be a composition of gelatine and glycerine, similar to that used in the chromograph or hectograph copying method. Such a mixture succeeded very well, spread on paper, as a backing for gelatine plates to prevent halation.

B. J. EDWARDS showed some prints on salted paper; one advantage claimed for this mode of printing was the matt surface which was given, and another was that by printing on paper larger than the negative, and shielding the margins during exposure, mounting could be dispensed with.

F. BEDFORD then read a paper on "Orthochromatic Photography," in the course of which he observed that orthochromatic effects were seen to most advantage when soluble silver was present in the film. Brann, of Dornach, when photographing the paintings in the National Gallery, used wet collodion. The speaker's first experiment had not proved successful, the samples of eosine with which he had worked being unsuited for the purpose, and contaminated by soluble chloride. Since he had used erythrosin prepared by Mr. Arnold Spiller, he had succeeded in obtaining the desired results. As to the conflicting views held regarding the action of the sensitizers, it would seem necessary to the maintenance of the chemical theory to require that a salt should be formed previous to the action of the light. He considered it against this theory that films treated with potassium bichromate did not lose their colour sensitiveness. Erythrosine sensitised very well for the green, but methyl violet and cyanine, particularly the latter, sensitised for red, and the use of one of the latter substances was necessary if the emulsion was to be rendered sensitive to that part of the spectrum. Although these substances rendered the emulsion sensitive for the colours mentioned, blue was still somewhat too active, and to keep this colour back in due proportion to the others, it is necessary to use a colour screen. For this purpose he had tried a plate of uranium glass, which was very powerful in keeping back the fluorescent rays; but for general use he preferred collodion coloured with



turmeric. This collodion he had used on the plan suggested by Mr. Debenham, i.e., had coated therewith the inner surface of the lens. The effect of this coloured screen on the exposure was that with the orthochromatic plate, three times as long time had to be given, whilst with an ordinary plate the exposure was increased about one hundred times. The paper was illustrated by diagrams in colour, and by photographs of these diagrams taken on ordinary and orthochromatised plates, with and without the yellow screen.

B. J. EDWARDS said that orthochromatic or isochromatic photography had not made the progress that was expected. He still, however, firmly believed that the time would come when we should no more think of using ordinary plates, than of returning to the use of collodion. In copying subjects where there was much blue, a yellow screen must be used to get any marked result, but with ordinary work it was not necessary. He did not think that we need represent red lighter than blue. The ray most used was the yellow ray. He did not consider that there was equal advantage gained when the isochromatising solution was applied after the emulsion was made. He wished particularly to call attention to the method of making the emulsion itself isochromatic. He had never succeeded in making bath plates that would keep. The isochromatic compound should be formed in the first instance. He had produced crystals of the compound of silver and eosine. He considered that eosine acted as sensitizing to yellow and green, and that in order to render less sensitive to blue, the screen must be used. He had not long since sent some plates to India, for the use of a gentleman who required to photograph snow-covered mountains which with ordinary plates would not come out with sufficient distinctness against the blue sky; but on these plates the sky came darker, and so allowed the snowy lights to show against it.

F. W. DONKIN said that in his experience of photographing snow-covered mountains, the blue sky had come too dark, rather than too light.

The CHAIRMAN'S experience had been similar to Mr. Donkin's.

J. R. GOTZ showed some photographs taken on plates made by Obernetter's process, in which aniline dyes, erythrosine, and cyanine were mixed with the silver.

The CHAIRMAN said that Mr. Bedford thought that there was a chemical compound. He was not going to quarrel with that supposition. The dye really became a developer, and when acted on by light, developed a small portion of the bromide of silver in contact with it. Vogel's idea of optical sensitizing was against every known law of physics. It assumed that more work could be got out of a ray than was in it. You might as well believe in perpetual motion. There was no such thing as a really orthochromatic plate. All attempts were merely approximations to that condition. The best way of utilising ready prepared ordinary plates, was by coating them with dyed varnish or collodion; but on the whole he preferred varnish. The coating was removed with spirit before development. In the case of cyanine there could not be chemical combination, but there was what was called a "lake" action. He (the Chairman) claimed to be the first who had made orthochromatic plates without dye. The process he had described before the Royal Society some twelve years ago, and would be found in the Transactions of that body.

W. E. DEBENHAM enquired whether in the varnish and collodion coated plates described by the Chairman, ammonia had been used.

The CHAIRMAN replied that the experiments had been made both with and without the addition of ammonia, and both had been successful.

W. ENGLAND said that formerly, with the collodion and bath process, to render colours more perfectly, he had used a collodion containing six grains of bromide and two grains of iodide to the ounce.

A Member used a diaphragm divided so as to carry a film of yellow collodion, but he found that it destroyed the sharpness of the image. He had not tried coating the lens with coloured collodion as recommended.

B. J. EDWARDS said that there must have been reticulation in the collodion to cause loss of sharpness. He had not found any loss of definition to arise from the use of coloured medium.

T. BOLAS enquired whether the last speaker could give particulars of the separating power of the lens with which no loss was occasioned by the use of a medium.

B. J. EDWARDS could not.

J. HUBERT said that he had used collodion on the lens two years ago, as the vehicle for holding the colour.

T. BOLAS said that it would be interesting to know whether anyone besides Mr. Edwards had found the definition of a lens to be uninjured when using a flexible diaphragm.

B. J. EDWARDS said that the definition was practically as good; there was no fault to be found with it.

S. A. WEBBER used a film of collodion between the sides of the diaphragm. He thought it sufficiently good to pass muster.

F. BEDFORD, in replying, said that the chemical theory was difficult to understand in the case of those dyes upon which the light had no action. Colourless sensitizers might exist. In all that he used with any success the emulsion retained a trace of the colour of the dye. When that last trace of colour had been removed there had been no orthochromatic properties left.

It was mentioned that the usual monthly meeting in April would be held on the 17th (the third Tuesday), and not on the second Tuesday, as usual; and the meeting then adjourned.

#### PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

AFTER the usual opening business on March 15th, E. G. Platt, M. N. Smith, G. W. Tottem, and W. M. Garner were elected members of the Association. F. Hamby, of 69, Upper Lewes Road, Brighton, was elected hon. local secretary for that district. W. F. Benham was appointed honorary solicitor to the Association.

On March 22nd, J. Davey, 186, Sauchiehall Street, Glasgow, was appointed hon. local secretary for Glasgow, and Herbert Fry, Kingston-on-Thames, elected a member of the Association.

On March 29th, H. Kruger (Huddersfield) and A. Price (London) having been elected members, the meeting considered two applications for assistance, and made grants in both cases as the circumstances required.

The Committee now being prepared to take action in the proposed "Orphan Fund," it was decided to make an appeal for support through the columns of the various photographic journals. (See letter to the Editor.) It is hoped by this publicity being given, that success will be assured. Donations will be acknowledged in this journal.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE usual weekly meeting was held on the 29th inst., W. ENGLAND in the chair.

A paper was read by W. M. ASHMAN on the "New Transferrotype Paper" (see p. 214) recently introduced by the Eastman Dry Plate and Film Company. During the reading of the paper the process was illustrated by the exposure and stripping of several films.

W. BEDFORD said from the name he concluded it referred to an old well-known process. Several members were of the same opinion.

J. JACKSON exhibited finished specimens of the transferrotype, both on paper and opal glass; also lantern transparencies. He said equally black images could be obtained with the pyro developer as with ferrons oxalate. The lantern slides shown had been developed with pyro. A warm tone, if desired, could be obtained by bleaching with bichloride of mercury, followed with ammonia. Parchment paper formed a very good support on which to transfer the films.

The CHAIRMAN asked if over-printed pictures could be re-developed.

J. JACKSON said the ordinary methods employed for reducing negatives he believed would apply equally well to this process.

W. M. ASHMAN said he was not aware that parchment paper could be used for this purpose. A transfer, however, could be made on to any surface not greasy.

A. HADDON believed that parchment paper was more likely to expand than the ordinary kinds of paper, consequently the distortion would be greater.

J. JACKSON said he had given preference to it only after trying several other kinds of paper, one of its advantages being that from its transparency the image could be seen in laying it down for transfer.

W. M. ASHMAN said an objection might be made to the reversal of the image. In this case double transfer could be employed equally as well.

W. H. PRESTWICH remarked that no one need be without that useful adjunct to the dark-room—a rocking apparatus. This could be readily made at a cost of less than one penny. He showed a contrivance he used for the purpose which answered capitally. It consisted simply of a piece of wood of sufficient size for the developing tray to rest upon. Nails driven a short



distance into the board near the edge of two of its sides in a line with each other, formed pivots upon which the board rocked; to a small screw-eye screwed into the centre of the board is attached a piece of string carrying a weight, the string passing through a hole or slot in the table or bench upon which the rocking apparatus is placed.

J. ZAEHNSDORF used a similar contrivance; it would rock for five minutes without attention.

This being a lantern night, a large collection of transparencies were projected on the screen, contributed by Mr. Cembrano, collodio-bromide and gelatine-bromide; L. Medland, gelatino-bromide; J. Jackson, transferotype; and P. L. Turner, who exhibited a series of coloured slides chiefly albumen.

Referring to coloured slides P. L. TURNER said his experience extended over a period of sixteen years. Painters of hand-drawn slides were now decidedly in the minority. The slides shown had not been selected as specimens of his skill, but were some he had on hand at the time.

W. M. ASHMAN remarked that few were aware of the large number of coloured slides that were stocked, and constantly sent out for exhibition. He believed a great many audiences preferred coloured slides to plain photographs.

J. ZAEHNSDORF thought the great fault of coloured slides was that the colour was put on too thickly.

P. L. TURNER said his aim was to get his colours as transparent as possible; the thickness of the colour on the slide was then of not so much consequence.

W. F. Benham was elected a member of the Association.

#### PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A MEETING of the Society was held March 7th, President GRAFF in the chair.

The Committee on Lantern Slide Interchange reported that it had received and exhibited the slides sent by the Society of Amateur Photographers of New York and the Boston Camera Club, and had now on hand to be shown those from the Brooklyn Camera Club and the 200 sent by the Camera Club of London, a selection from which would be shown at the Conversational meeting March 21st.

Representatives from the various Societies in the Interchange held a conference, which adopted the following regulations for the organization of the American Lantern Slide Interchange:—

*Name.*—The name of the association shall be called The American Lantern Slide Interchange.

*Object.*—The object of the organization shall be to promote interest in photography through the medium of lantern slides, by arranging for regular interchanges of the work of the different clubs between each other, and exchanges jointly with the clubs of England.

*Membership.*—The members of this association shall consist of the following nine photographic associations, to wit: Photographic Society of Philadelphia, Philadelphia Amateur Photographic Club, The Society of Amateur Photographers of New York, The Brooklyn Camera Club, The Boston Camera Club, The Pittsburg Amateur Photographers' Society, The Cincinnati Camera Club, The St. Louis Association of Amateur Photographers, and the Chicago Lantern Slide Club.

The membership may be increased at any time by a vote of the majority of the members of the Board of Directors. Any applicant for membership shall submit with its application a set of not less than fifty slides made by its own members. Any member of the Interchange desiring to withdraw from membership shall notify the manager on or before the 20th of February of each year.

*Board of Directors.*—Each constituent society shall, at its first regular meeting in March, 1888, and at its first regular meeting in January of each year thereafter, elect one of its members as a delegate. These delegates, when elected, shall constitute a Board of Directors.

On the 1st of April in the year 1888, and on the 1st of March in every year thereafter, the Board of Directors shall organize by electing, either at a meeting called for that purpose or by correspondence, as shall be deemed best, a manager and two assistants, who shall together constitute the Executive Committee of said Board of Directors.

The Executive Committee of the Board of Directors shall determine the number of slides to be contributed to the Interchange each year; they shall formulate a system of rules governing the progress of the slides accepted for the Interchange, and shall decide how the slides to be sent abroad are to

be chosen; also, how the foreign slides received in exchange shall be divided.

The Committee shall issue a call on or before the 20th of May of each year for contributions of slides from each society, which slides must be shipped to the manager on or before the 15th of October following.

It shall be the duty of the Executive Committee to determine what portion of the slides contributed by each society shall be sent on the circuit. If more than fifty per cent. of those submitted by any one society be thought unworthy of exhibition, the whole number submitted shall be returned to the society sending them. If this occurs upon two successive years the membership of that society shall cease.

The Committee may designate some topic or text to be illustrated by the various members of the Interchange for that year, and may specify the number of slides and the amount of text to be furnished for the purpose of such illustration. In case of the clubs being called upon to illustrate some subject connected with descriptive text for reading, not more than seventy-five per cent. of the negative and slide work need necessarily be that of the members of the clubs respectively.

*Sizes, Mats, and Labels.*—Slides for submission to the Interchange shall not vary more than one-sixteenth of an inch from the standard size of three and one-fourth inches in height by four inches in length, the picture being perpendicular to the four-inch side of the plate.

The diagonal of the mat opening shall not exceed four and one-eighth inches, and the subject shall be centred on the plate.

Slides shall be marked as follows: The subject-name shall be placed on the right-hand end of the picture as you look at the positive in its proper position, and a thumb label containing the invoice number on the lower left-hand corner of the same.

*Slides and Negatives.*—The negatives from which slides are made must be the work of the member submitting the same, and when the slide is not also the member's work, it must be so stated.

*Dues.*—Each society shall, on its adoption of these regulations, pay to the manager the sum of ten dollars. Whenever the funds in the hands of the manager shall be reduced to less than twenty-five dollars, each society shall be assessed the sum of ten dollars. Each society shall be reimbursed, from the funds in the hands of the manager, for its expenses incurred in the shipment of slides.

*Amendments.*—Suggestions for amendments to these regulations shall be made in writing before February 1st of each year and sent to the manager.

He shall submit them to the members of the newly-elected Board of Directors for their individual consideration by the 15th of March following, and a vote taken thereon by correspondence (if no meeting is held).

If a majority of the Board of Directors have not voted in favour by the 15th of April following, the amendment shall be declared lost.

This Constitution shall be considered adopted and in force when it has been ratified by not less than five of the societies herein mentioned.

Mr. George Bullock, of the Cincinnati Camera Club, is hereby designated to carry out, on behalf of the societies represented, the interchange of slides now in progress, and is also authorized to complete the organization of this interchange.

JOSEPH H. BURROUGHS exhibited two of the new Welsbach Incandescent Gas Burners. The mantles were those intended to produce a white light, which is best adapted for photographic use. Mr. Burroughs also showed some negatives and lantern slides made by means of this light. The negatives were copies of engravings, made with an exposure of two minutes. Two burners were placed, one at each side of the camera, as close to the engraving as possible without allowing the light to shine directly in the lens. Reflectors were used to concentrate the light on the picture. The stop used was about F-30. For the lantern slides made from these negatives an exposure of five minutes was given, with F-16 stops on Carbutt's A-12 lantern plates. Hydrokinone developer was used. The lights showed attracted great interest from the members, and many questions were asked about them. It was stated that the mantles had stood a test of over 1,000 hours. The lights shown were not of the most approved form made by the company. Those now being made, and which will soon be placed on the market, are very much more powerful. They will be made in various sizes suitable for different purposes,



Mr. BELL showed a piece of ruby glass prepared by himself from a formula which would prove valuable to photographers so situated that the regular article could not be obtained. 150 grains of Heinrich's gelatine is dissolved in 6 ounces water, and 3 grains chloride ammonium added. To this is added a solution of 30 grains nitrate of silver in  $\frac{1}{2}$  ounce water. A clean piece of glass is warmed and coated with the gelatine solution at a temperature of 100° F. Once ounce of the emulsion is sufficient for a 10 by 12 plate. After coating, place the glass on a level marble slab or glass plate to set and dry. When dry expose to sunlight, and the colour will change to a beautiful orange ruby exactly suitable for dark room illumination.

Mr. WOOD referred to a recent statement by President Walker, of the Society of Amateur Photographers of New York, to the effect that the shape of the diaphragm opening, whether round or square, made no difference in the resulting picture. He showed some figure pictures in which the background was out of focus. The usual round spots of light in the background were square in the pictures shown, this being the shape of the diaphragm opening in the Hoover shutter used in making the exposure.

Mr. WOOD also showed two instantaneous pictures made, one during a rain storm, and one when snow was falling. Both were quite successful, but neither the falling raindrops or snowflakes appeared in the prints shown.

#### SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

The regular meeting called for Tuesday evening, March 13th, was so slimly attended, owing to the great snow blizzard (only thirteen being present) that no business was transacted. After a short informal consultation, the meeting adjourned.

On Wednesday evening, March 21st, W. H. WALMSLEY, of Philadelphia, read a paper on "Photography," as applied to the microscope and lantern slide making in connection therewith. The new feature spoken of in the apparatus was the attachment of a small conical bellows to the front of the camera, into which the barrel of the microscope projected. The advantage was that the bellows readily accommodated the movement of the microscope barrel in focussing, and allowed greater freedom in moving the whole microscope to or from the copying camera. Another improvement was the use of larger milled heads on the microscope focussing shafts, which enabled the operator, in manipulating the focussing cords at the back of the camera, to secure a finer focus. As a focussing screen, he advised the use of heavy plate glass with lines scratched on the surface in squares on the side facing the lens. He found this more effective than a slightly exposed, developed, and fixed gelatine plate. In making lantern slides he preferred the method of reducing in the camera to contact, but failed to state whether he used daylight or artificial light for reducing. He illuminated the microscope object for making negatives with a MacAllister patent kerosine lamp, in which the wicks are placed horizontally to the line of light.

Following the reading of the paper, which was listened to with much interest, about a hundred and fifty slides of microscopic objects were projected on the screen in T. T. Eckert's Jr. lantern, which was operated by himself and Mr. Singer. Many of the subjects were quite interesting, embracing insects, bacteria so fatal in cholera, sections of various kinds of wood, mineralogical subjects, sections of the human hair and skin, mosses, beautiful diatoms, and many other varieties of shells. He had recently obtained excellent negatives of stained and coloured specimens on Carbutt's new orthochromatic plates, and exhibited slides from them; he had also made excellent lantern slides by means of Eastman's transferotype paper. Those shown were extremely clear and brilliant. He used both the pyro and oxalate developers with equal success.

### Talk in the Studio.

AMATEUR PHOTOGRAPHY IN IRELAND.—Last week we referred to the announcement of the *Weekly Freeman* as to a series of articles on "Amateur Photography" to appear in the paper, and the first of the series is published in the issue for last Saturday, March 21st, a week earlier than was announced. The first paper commences by alluding to Fenelon's fabulous "Visit to the Isle of Wouders," where there was no painter, but if anyone wanted to procure the portrait of a friend, a picture, a beautiful landscape, or any other object, water was placed in great basins, the object which it was desired to paint being in front of the water.

After a time the water froze and became a mirror, on which the image permanently remained. The beginner is recommended to purchase a small or rather low-priced set to begin with, and is instructed in the principal points to be attended to in selecting the apparatus and setting it up for use. Altogether the first article promises well, and if the remainder should prove to be up to the same standard the series will be well worth cutting out for reference; or perhaps they may be reprinted in book form.

SELL'S DICTIONARY OF THE WORLD'S PRESS.—This annual—now eight years old—has steadily increased in size; the issue before us being so large as to weigh six pounds. Besides a comprehensive list of publications, with advertising rates and other particulars, is a series of articles on topics of interest to journalists, these articles being written by well known experts; also over sixty portraits of prominent newspaper men, many of those portraits being from phototypic blocks. The price is two shillings.

DRY PLATES AND CHEMICAL LIST FROM MAWSON AND SWAN.—From this firm we have received for notice a large package containing a liberal supply of the various sizes and kinds of plates they manufacture, and we have to congratulate them upon excellence of manufacture, not only as regards the emulsion itself, but also as to the coating of the plates and packing. We do not review samples of plates in the ordinary course, as plates cannot be judged with the same certainty as books or apparatus, because the success of an individual with any given plates depends much upon his experience with those particular plates. Mawson and Swan also send some excellent samples of bromide positive paper, and a comprehensive list of chemicals—a list including many of the rarer articles which are not ordinarily obtainable from the photographic stock dealer.

PHOTOGRAPHIC CLUB.—The subject for discussion on April 11th will be "Copying."

### To Correspondents.

\*. Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER AND CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

S. G. YERBURY.—If really different from those which have appeared, we shall be pleased to have particulars.

F. COLLINS.—The only work of the kind is the "Photographer's Indispensable Hand-book," published by Iliffe, of Coventry.

W. LINN.—1 and 2. For "minims" read "grains." 3. It will not keep indefinitely, but slowly deteriorates. Still, you need not hesitate to use it after it has been made up for a week.

J. BROOKS.—1. Oil silk is the most suitable material. 2. There is an "India-Rubber Trade Journal," and we think the price is 6d. monthly.

INDEX.—We hear that Anthony and Co., of New York, contemplate the issue of something of the kind, but have received no particulars.

T. CARRINGTON.—1. One principal reason is that he got into trouble by puffing a piece of apparatus which he had not seen; indeed, which never existed. 2. We cannot inform you. 3. The addition of alcohol is generally necessary, but seldom more than half a drachm to each ounce is required. 4. If carefully used, there is but little difficulty in exactly following the outline.

H. COLEBROOK.—Thank you for the short paper, which shall be put in hand.

R. G. L.—See the YEAR-BOOK.

T. C.—Certainly a very disgraceful piece of trade boycotting, but just such as one might expect from a commercialist of the present day. We can do nothing in the matter.

R. M. S. STEWART.—1. A tin screen will answer the purpose if so arranged as to thoroughly fence off the light, and a small Fletcher's burner will serve. 2. They are very satisfactory.

E. J. FARLIE.—Obtain a summons at the County Court for the return of the money.

### The Photographic News.

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For Advertisement Scale see page v.



# THE PHOTOGRAPHIC NEWS.

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### TOWARDS ORTHOCHROMATIC PHOTOGRAPHY BY THE COLOURED SCREEN.

ORTHOCHROMATIC photography is an ideal towards which we are making step after step, each step having, in general, reference to the equivalent reproduction of some particular tint or set of tints; and among those who have recently laboured, more especially on the chemical side of the question, may be mentioned Abney, Bothamley, Ives, Obernetter, Vogel, and Waterhouse; although—as is usual in such cases—a commercialist who has purchased a patent assumes a lordly position as regards the exploitation of the working method which is the outcome of the labours of those who labour only in the interest of knowledge and progress.

Now there are two sides of orthochromatic photography—the chemical side as bearing upon the composition of the plate, and the optical side, as bearing on the use of coloured screens or other use of coloured lights; and although much progress has been made of late on the chemical side, comparatively little advance has been made during the past quarter of a century on the optical side.

The coloured screen for orthochromatic photography was, we believe, never definitely proposed until thirty years ago, when the use of the yellow screen was set forth in a leader which appeared in the PHOTOGRAPHIC NEWS on October 15th, 1858.

This leader was headed "On Copying Paintings by Means of Photography," and it commences by expressing considerable doubt whether the problem of obtaining a true representation of a painting will ever be realised—a doubt which one might just as emphatically express now that thirty years have elapsed.

The article in question goes on to point out how it is "possible to obtain far more correct copies of paintings than are usually met with," and here are the directions: "The collodion should not be iodized, but bromized, with four grains of bromide of cadmium to an ounce of plain collodion; and the lens, which must have a sheet of yellow glass close in front of it, should be a portrait combination working with full aperture, as the time of exposure to the feeble rays which alone can filter through the yellow glass will be enormous, even when a picture is illuminated as perfectly as possible."

Other parts of the article in question deal with the effect of using in front of the lens a cell containing a solution of sulphate of quinine, and detail experiments with several thicknesses of yellow glass in front of the lens, a constant improvement—as regards approximation to truth—being noticed as the number of thicknesses of yellow glass was increased, until the bad keeping qualities of the collodion plate brought the experiment to a limit.

Considering that photographers sometimes enter into discussions as to who first introduced the yellow screen,

and in doing so only mention those who have worked with it during the past ten years or so, it is only fair to give the personal credit of this first great step towards orthochromatic photography to William Crookes, who was editor of the PHOTOGRAPHIC NEWS thirty years ago, when the article in question was written.

We certainly do not wish it to be understood that we attach more importance to the screen than to the plates as a means towards orthochromatic representation, but it may be stated that there are now many plates in the market which give excellent results when used in conjunction with a suitable yellow screen, and the photographer who has occasion to copy a painting only occasionally, need seldom do more than use a yellow screen.

Now the question arises as to what sort of a yellow screen is most suitable; and to begin with, we unhesitatingly refer to the loose film of coloured collodion or gelatine as one of the least satisfactory arrangements, as it invariably lowers the defining powers of the lens, and usually reduces the defining power of a high-class objective to the standard of the lowest grade of cheap French instruments.

For certain classes of work—the every-day portrait routine of the ordinary portraitist, and the copying of a certain class of pictures—this may, perhaps, be no very material disadvantage—indeed, there may be cases in which it is a positive advantage; but it is quite the exception to have a loose film so perfect and so uniformly stretched as not to render the taking of a negative suited for considerable enlargement, or for the finer mechanical process, altogether an impossibility when it is used.

A film of coloured collodion upon one of the surfaces of the objective is generally far more satisfactory, and if care is taken to use a collodion which dries with a bright hard surface, and the coating is uniform, the defining power of the objective is—as far as our observations go—absolutely unaffected. There is, however, an objection to being repeatedly coating the surface of a lens and clearing the film off, as the polish must suffer somewhat at each operation; therefore it is far more convenient to use a separate tinted glass, which may be placed before the lens, behind it, or in the place occupied by the diaphragm; and if this tinted (yellow) glass is of good quality, and optically worked so that the faces shall be flat and parallel, the use of the screen is in no way injurious to the separating power of the lens. Such screens might be furnished, with the lenses, by the opticians at a moderate cost, but at present they are difficult to obtain, and inordinately expensive. It is true that if a person who has knowledge as to how to select a good piece of glass spends a long time hunting through the stock of a glass dealer, he may, perhaps, be able to select a piece of yellow glass which is very much better than a loose film, or a piece of patent plate which can be advantageously coated with collodion, and used as



a screen ; but there is a considerable element of chance about the transaction.

We are, therefore, glad to have received for notice samples of flat glass suitable for use as screens from J. R. Gotz, of 19, Buckingham Street, Adelphi, who is known as being agent for orthochromatic plates in London—glass which, though not surfaced and parallelised to the utmost limit possible, is nevertheless quite exact enough for photographic work, even when a negative is to be used in making an enlargement. The pieces sent are four inches in diameter, and the yellow glass of this size can, we are informed, be sold at so low a price as three shillings.

### DIFFUSION OF FOCUS.

BY W. H. WHEELER.

THE lenses which the late Mr. Dallmeyer contrived with a view to meet the wishes of those who desired a more equal softness in large portraits than variations of conjugate focus will allow in a perfectly corrected combination, have now been before the photographic world for more than twenty years, and yet we seem as far as ever from unanimity in our appreciation of the advantages claimed for them. It need surprise no one that tastes should differ, but it is scarcely satisfactory that the theory should still be matter of dispute. This, however, cannot easily be helped. The case is one in which mathematical demonstration becomes less convincing the more confidently it is pressed, for theory can hardly grasp all the conditions of the case. The visual effect of a small amount of spherical aberration in an uncorrected lens seems to differ from that of a small balance left in the correction of large original aberrations—probably from a difference in the resulting phenomena of interference. This is probably also one cause of the remarkable difference in the effect of aberration shown in a reflecting or refracting telescope respectively. It reminds one of the different effect of under-exposure with wet collodion as compared with an ordinary gelatine plate. And it is not probable (indeed the reverse is pretty certain) that the photographic effect of aberration strictly resembles the visual. In the latter the difference shown on examination with a high and a low magnifying power is remarkable ; while the same kind of difference is not seen when an image formed by an aplanatic lens is simply out of focus. Let us try to approach the subject more closely.

It is conceded at once that with an imperfectly corrected lens there is, strictly speaking, no real focus at all ; while with a perfectly corrected one, no actual depth of focus can really exist. But as practically the greater part, if not the whole, of every photographic image consists of points, which, though not perfectly sharp, are yet sufficiently so to give us a pleasing picture, we may dismiss altogether the question of absolute focus, and consider only what difference may exist between the approximate distinctness of an image formed on the one hand by such circles of confusion as represent points simply out of focus, or on the other by what are called "circles of aberration." Oblique errors we had better set aside, as their consideration would only confuse the subject before us.

We will first suppose our lens to be accurately corrected—in which case the rays from a given point in any object in a line with the lens axis will be brought to a corresponding point in the image when accurately focussed. But when out of focus, the rays will be evenly distributed over a circular area, whose diameter is to the aperture of the lens as are the respective distances of this small circular area and of the lens from the true focus. It is the overlapping of these circular areas which causes indistinctness.

Now let us introduce positive spherical aberration, and get the best focus we can. As Mr. T. R. Dallmeyer describes it, the effect is to give a sharp point surrounded by a halo ; and it will be interesting, first, to consider

how this is brought about ; and, secondly, what is the difference in effect between such points surrounded by halos, and the evenly-covered areas over which the image of a point out of focus is distributed when aberration is corrected.

Spherical aberration results, as we know, in a difference between the focal length of the central and marginal parts of a lens. When the aberration is positive the central focus is the longest, and when negative the marginal focus will be the longest. Instead, therefore, of one image of a point, or of a small object, being formed at the true focus, an indefinite number of images may be considered as superposed ; the one nearest to the lens being formed (in the case of positive aberration) by the marginal rays, and that furthest from the lens by the central rays. Or, as Petzval's paper (quoted by Mr. Chapman Jones) says, the image is produced, not on a surface (either curved or flat), but filling a certain space.

Now, as we move from the centre of the lens to its margin, concentric circles of equal breadth have evidently a larger area, so that the image produced by the central part will be overpowered by the greater light from the marginal rays. On the other hand, these concentric circles, if representing equal distances longitudinally between the superposed images, should not be taken as of equal breadth, seeing that aberration increases in so rapid a ratio (approximately as the cube of the aperture) as we approach the margin. On the whole, the focus we generally recognise as the best, though varying a little in position as oblique error becomes perceptible, will be the true focus of a concentric circle nearer to the margin than to the centre of the lens, and the image formed by that concentric circle gives the "point." This point is a little strengthened by some of the central rays which have not been refracted enough to stray far, and the remainder—if they behaved like the "out-of-focus" rays of an aplanatic pencil—would be diffused pretty equally over a small circle surrounding the point. But here comes in a remarkable phenomenon—that of interference—the effect of which is to produce the halo which, extending far beyond the proper limits of the circle of aberration, is thinner and more diffused, thus leaving the "point" more distinct, and softening the surrounding parts more equally and harmoniously (from the numerous faint overlappings) than the even and denser distribution of rays over the small circular area which represents the image of a point merely out of focus. For in the latter case no effect of interference is perceptible, and no halo exists. Thus, both points and halos are present in the indistinctness caused by a small balance of spherical aberration left in a partially corrected lens, and both are absent from the image produced by an aplanatic lens simply out of focus.

But this is not all. We have supposed that with the lens giving aberration, the apparently best focus has been selected. It is pretty evident, however, from what has gone before, that as we shorten the focus, the "point" may be produced by a concentric ring still nearer to the margin ; or, if we lengthen it a little, we may produce it by more central parts. The perceived difference between the two effects, the shorter focus giving a sharper point and larger halo, while the longer one gives a smaller halo but a less distinct point, is a most useful guide to the optician ; for negative aberration produces the phenomena in reverse order, so that by their aid he can readily distinguish whether the aberration be positive or negative, as well as form a better judgment as to its amount. We can clearly see that some small range of adjustment exists, within which the focus may be altered without greatly affecting the definition ; the "point" representing successively different concentric circles. The reverse of this condition is what we mean when we say that a well corrected lens "comes sharply to focus ;" a given alteration of the focus producing a more perceptible effect than with a lens imperfectly corrected. How far it is more perceptible from the contrast between accuracy and in-



accuracy being more readily distinguished than that between varying shades of error, is a question which has much to do with legitimate differences in opinion. And in connection with this, which may, perhaps, be called a psychical aspect of the case, we remark that undoubtedly the attention is in general attracted most by the best defined parts of the image; and if we could secure the best definition for those parts of the subject most suitable for this selection and emphasis, there would be a good deal to say in favour of the most accurate definition we could obtain. But in a portrait, what part of the features should we select? Sir David Salomons claims to have obtained by his method microscopic definition of both nose and ear; and if that were secured with a full face it would be eminently satisfactory, but the pose does not appear to be stated. On the whole, there is certainly a consensus of opinion in favour of more even definition.

I believe, that in general apprehension, "depth of focus" is very much confused with flatness of field, and it is this which leads so many to consider it a quality specially belonging to particular lenses. Nevertheless, I venture to think that some of those who may read the above explanation may be of opinion with myself, that whatever errors are embodied in the popular view, there is yet a real advantage gained as to apparent depth of focus by introducing a small amount of aberration. For we see that the circle of error formed by an applanatic lens has no central point, whereas there is a small range within which the circle of error produced by one affected by aberration continues to retain its point, the surrounding halo giving, too, a softer and perhaps a less confused effect than an applanatic lens equally out of focus.

During a controversy in these columns some years ago, touching on this subject, I ventured to say\*: "Diffusion of focus seems to me a happy phrase, expressing alike the softening of the true focal plane, and the assimilation to it of other planes, some of the rays from which, when affected by aberration, may cross their axis at the image; though, were the lens strictly applanatic, none could do so out of the one plane focussed on."

The present explanation is little more than an amplification of the view then expressed.

## DIRECT CARBON PRINTING.—A SUGGESTION.

BY H. COLEBROOK.

THE remarks below are merely suggestive, given with the idea that someone with more science and means at his disposal may think it worth while to lick them into shape.

The obstacle to direct printing by the ordinary method is, I presume, that (a) the action of light affecting the surface of the film, only that part in intimate contact with the support remains soluble, and on development leaves the support, carrying the insoluble part with it; or (b) that the action of light being allowed to continue until that part in intimate contact with the support is rendered insoluble, the whole film becomes insoluble. This being the case, the thought struck me that it being possible to manufacture a film of gelatine so thin that it is printable from both sides, why should it not be possible to manufacture a film of pigmented gelatine so thin that the action of light on the surface would practically mean the action of light on the part in contact with the support? Of course this was a mistake on my part, but has its application in the method I shall describe.

The support is coated with a film of gelatine, and sensitized in the bichromate bath, exposed to light until insoluble, and then dried thoroughly. It is then coated with a very thin film of pigmented gelatine, and again dried, and exposed under a negative in the ordinary way. By this means the underneath surface of the pigmented gelatine only is sensitized, the drawback of course being

that the sensitive surface cannot be in perfect contact with the negative. This will be of little moment if a very thin film be prepared.

These remarks, as I said before, are merely suggestive. I claim nothing for them as they stand, knowing full well that the nuisance of preparing plates and paper for the above more than outweighs the nuisance of single and double transfer; but granting the process practicable if photographic dealers were to take upon themselves the supply of these films for direct printing, I think they would find a ready sale, as the advantages of direct printing must be obvious to all who have worked the process.

## NOTES ON THE MAGNESIUM LIGHTS.

BY P. SWANSON.\*

THE requirements of an artificial light [apparatus for general photographic portraiture are such, that negatives (of groups or of single figures) taken by its agency equal those taken by means of daylight. The conditions, however, of negative making by daylight, and of negative making by magnesium light, are entirely different, and as this matter has not yet received the attention it merits, it may be well to enquire minutely what the latter conditions are.

When photographing an average sitter during daylight it matters little, in most cases, whether the exposure is a fraction of a second, or five seconds, so long as the negative is "fully up," and the desired expression is secured; but with a light of such extraordinary brilliancy as the magnesium compounds are capable of giving, the exposure must be exceedingly brief, because, no matter what kind of sitter is to be taken, if the exposure be at all prolonged, the negative will show a most unnatural and startled expression on the sitter's face.

This leads us to enquire what is the longest exposure that can be given without getting these undesirable qualities.

A quantity of magnesium flashing compounds is discharged. Visual perception of the flash produced is conveyed to the brain, which in its turn acts in the sensori-motor nerves, causing muscular contraction in the shape of an involuntary start on the sitter's part. Eminent physiologists tell that the period that elapses between it (the flash) and the sitter's involuntary start is 0.2 of a second if the flash occur unexpectedly; but if our sitter be previously made aware, and is breathlessly awaiting this event, then the time is reduced to 0.077 of a second.

Therefore, it is obvious that the duration of the exposure may be nearly three times as great if we can devise some means to fire off our flash-light at a moment when the sitter least expects it; at that moment, too, the expression is likely to be most suitable. In a word, take your sitters unawares, and the exposure need not be less than  $\frac{1}{2}$  of a second; make them aware, then, it cannot be longer than  $\frac{1}{13}$  of a second. These are the theoretical requirements from a scientific point of view.

Now for the artistic. Assuming that we are in possession of one of the pyrotechnic compounds of magnesium that will be consumed in  $\frac{1}{2}$  of a second or less (there are many reliable prescriptions for these which have recently appeared in the photographic publications), it is hopeless to look for the artistic requirements in any one-light arrangement. A number of lights is absolutely necessary, and these should permit of easy adjustment, in order to produce the proper effects of light and shade on sitters. To accomplish preliminary lighting and for focussing, a separate series of other lights—such as gas—are used, and these should occupy the same, or nearly the same, places as the more actinic ones. To fulfil scientific and artistic requirements, it is necessary to discharge the several actinic lights in such a manner that the time that elapses from the beginning of the first flash to the termination of the last one shall not exceed a fifth part of a

\* PHOTOGRAPHIC NEWS, 1883, p. 668.

\* See also p. 37 of the present Volume.



second. A suitable and reliable method of performing this operation is the point that seems to exercise the mental powers of many of the experimentalists at present. As yet the contest lies almost, if not wholly, between electrical and pneumatic methods. We shall now proceed to examine a few of the principal methods that have been proposed, taking electrical devices first.

One plan is that of rendering platina wires incandescent, or at least red-hot, by passing through them a current from a galvanic battery composed of bichromate cells. The arrangement is the multiple arc: that is, a separate pair of wires, each of the same gauge, lead from the battery to each length of platinum wire. The shorter and thinner the platinum wires are, the more rapidly do they become heated, and the less battery power accomplishes this. It is needless to go further into particulars. Those who wish to experiment will find full particulars in the January and February numbers of this journal, 1886, in articles by Mr. F. C. Beach. I tried innumerable experiments with this method, using gun-cotton and magnesium; but in no way could I get it to fulfil the requirements already specified, for the following reasons.

The slightest difference in the lengths of the respective pieces of platinum wire caused a very great difference in their temperatures, and consequently the various charges were not ignited at the same moment. This defect may be remedied to a certain extent by increasing the battery power, which is attained either by adding more cells, or by removing the porous pots in the existing cells (in order to lessen internal resistance).

Increase of battery power means greater rapidity in heating, therefore the periods between the flashes are less appreciable. But here again we are met with what seems to me the insurmountable difficulty of this method, and that is fusion of the platinum wires, if three separate pieces are to be rendered hot, one of the fuses (owing to its being, perhaps, very slightly shorter than the others). Previous to this catastrophe a third of the current passed through each length, but now, as one piece is gone, the current, passing through the remaining two, is increased from a third to a half, and the result of this is that a similar fate overtakes them in a hundredth part of the time it has taken to describe what has occurred.

It seems, too, that the presence of explosives or oxygen assists fusion of platina. To recapitulate: if all the platina wires remain whole after discharge, the latter consisted of a series of puffs with irregular intervals between; but if the discharge was anything like simultaneous, then the wires are found to be fused. Such was my experience. Others may have more success; but I see no way of adopting this method to get anything like the degree of simultaneity necessary.

It has also been suggested to use the high tension spark, such as is got from a Leyden jar or a Holtz machine, to fire a number of charges of magnesium powder mixed with some pyrotechnic compound and placed upon bits of tin-foil, with a break in the circuit where each charge is placed. This is the least practicable of any of the plans that have been proposed; because, 1st, the high tension spark is deficient in heating power, and will pass through or scatter gunpowder without igniting it; 2nd, the conducting power of the mixture suggested is such that it is impossible to fire it in the manner proposed; even if it were, it would take an enormous battery of Leyden jars to send the spark over a number of breaks in the circuit. A few turns of a Holtz machine might do, but the crackling of that instrument would give due warning to the sitter to be prepared for the worst, and in that case the exposure must be cut down to  $\frac{1}{15}$  second.

The best method that I am acquainted with is that known as Abel's fuses, a slight modification of which I briefly described in your issue of Jan. 20th (printed fuses there by mistake). I did not go into details at that time, because I imagined that methods of utilizing electricity for

this purpose were generally understood; but such is not the case, if we judge from the following criticism (by one of the ablest writers on photography), which appeared a week or two later in a contemporary journal:—"As yet we have no evidence that the various charges can be fired sufficiently synchronously to anticipate muscular action on the part of the sitters," and something more to the effect that this method of firing is complicated, three different substances having to be fired in turn.

In reply, I may state that the matter is no more complicated than the firing of a gun. Indeed, the latter act is almost a perfect analogy. A telegraph key takes the place of the trigger, an Abel's fuse of the cap, and a mixture of gun-cotton and magnesium powder in an atmosphere of oxygen is the substitute for gunpowder. The duration of exposure is  $\frac{1}{10}$ th of a second. This shows at least double the rapidity necessary to anticipate muscular action on the part of the sitters.

But apart from my own experiments there is "sufficient evidence" in the appended extract from Ferguson's Electricity.

"When several charges have to be fired at once, the whole are generally included in one circuit. As there is always some difference in steel wires,\* or in the way they are fitted, it not unfrequently happens that one cartridge is fired before the others. The circuit is thus broken, and all the others left unfired.† With this arrangement there is no certainty of a simultaneous discharge. If this is wanted, the galvanic current must be abandoned, and recourse must be had to the electricity of the induction coil. If the ends of the wires within cartridge be brought so near that the induced current can leap over the distance between them, no steel wire is needed; the inductive spark itself can effect the ignition. After explosion, the distance of the ends remains the same, and the sparks continue. If, then, there be several charges to be fired in the same circuit, the firing of one does not stop the current, which continues even after all have been fired. The induction spark does not, however, kindle gunpowder with certainty, so that between the ends some material must be placed more easily ignited than gunpowder, such as white gunpowder, gun-cotton, &c. When the number of simultaneous explosions is great (five or six), some very readily exploded substance, such as fulminating mercury, must be placed in the path of the spark discharge."

"Abel's fuses give us all that can be wished in the way of certainty and simplicity. Abel does not use a thin platinum wire between the circuit terminations, but he uses what is in effect the same, a mixture that conducts, but conducts with difficulty. His fuses are primed with a mixture of chlorate of potassium, sulphosulphide of copper, and subsulphide of copper. The conducting substance is the subsulphide of copper, which must be added in such a proportion as to render the whole difficultly conducting. When the current passes through the mixture, it develops sufficient heat to explode it, and thereby the charge of gunpowder. Abel's fuses are chiefly intended for the electricity of the induction coil, although the ingredients may be so compounded as to serve for that of the voltaic battery. A very small machine is sufficient for the purpose. The little pocket machines used for medical purposes readily fire one of these fuses. They are very small, some of them about half an inch in length and half, the thickness of an ordinary pencil."

This article is quoted in full for fear of losing its full meaning.‡

\* This refers to the burning of steel wires in place of rendering platina wires incandescent; as already spoken of, observe, also, that the arrangement is single circuit in the one; and multiple arc in the other.

† This does not occur if multiple arc is substituted.

‡ I am led to do this, as I believe that the most elementary principles of electricity are not generally understood as they ought to be. In confirmation of which, see the statement that is, at present, going the rounds of the papers unchallenged. It is to the effect that a Company is formed in London to supply electricity at so much per 1,000 cubic feet! It would be very interesting to know how much a cubic foot of electricity is.



Existing pneumatic methods of effecting simultaneous combustion of a number of charges are extremely crude, and may be dismissed in a very few words, because they do not at all fulfil our requirements. In most cases the flash, or rather flashes, continue nearly a second. In the reports of some of the London photographic societies statements appeared that three charges were fired simultaneously by pneumatic means. But as no more scientific method to prove this than watching the operation with the eye was adopted, this statement must be taken *cum grano salis*, for it is a well-known fact that the sensation of light continues  $\frac{1}{2}$  of a second after the flash is over; therefore, if a number of flashes succeed each other separately, by a less interval they appear as one flash.

A very great improvement may be made by using air in a more highly compressed state. For instance, instead of using a pneumatic ball, take an air pistol or gun, slip the rubber tubing over the muzzle, and pull the trigger. This shortens the flash in a degree appreciable even to the eye. Its exact duration I have not as yet had time to test in a scientific manner; but it is a very great advance on the air-ball—of that I am satisfied.

Another reliable method of using electricity, not for firing, but for jerking a number of charges into the existing lights used for focussing, may be briefly indicated as follows:—

Take 2 ounces Harvey's diamond grain gunpowder, reduce it to an impalpable state by grinding it in a mortar—do not smoke a cigar when performing this operation—add half ounce magnesium powder, and mix well. This compound may now be weighed out in suitable quantities and made up in little tissue paper envelopes. The paper of which the latter is composed should be previously soaked in a mixture of gunpowder and water. When thoroughly dried it is gummed and formed into envelopes. An advantage of having the charges in this form is, they may be suspended so as to permit the light to strike downward. It is obvious that the slightest spark will set fire to these and their contents.

A number of wire brackets are made and attached to the wall immediately above the ordinary ones, in such a manner that both describe the same circle when moved. Electro-magnets are fixed near the centres on which each wire bracket moves. On the point of each bracket is suspended an envelope containing the above-mentioned explosive mixture. When a current is sent through the magnets the envelopes are jerked into the flames and explode as quick as you please. Provision must be made to allow the smoke to escape.

For calculating the duration of flashing lights it is necessary to be provided with a clock constructed to register minute fractions of a second. One having a large black dial with white divisions, and a long centre seconds-hand making a complete revolution once every second, is the simplest form. By setting up this clock to be photographed, the distance that the hand travels during the flash is found marked on the negative, and thus its duration is accurately determined even to  $\frac{1}{3600}$  part of a second.

## SPECTRUM ANALYSIS.

BY W. IVISON MACADAM.\*

In the search after truth chemistry has called to its aid nearly every other branch of physical science, and by means of the forces thus impressed into the service has been able to accomplish deeds which otherwise never could have been worked out.

In 1862 Professor Bunsen, of Heidelberg, intimated to the scientific world the results of his researches on spectrum analysis. Since then rapid progress has been made, and now in the five-and-twentieth year of its existence we find not a slender young man, but a veritable giant—a giant who, if he continues to grow, and he promises to do so, will soon overtop many of the

other children of chemistry. Already spectrum analysis has overstepped the bounds of this world, and soaring aloft has enabled us to tell the composition of the sun, although that luminary is distant from us a computed ninety-one millions of miles. The more distant stars have also fallen a prey to this giant, and having fed upon worlds his unsatiated appetite has caused him to swallow even these curious gaseous collections known as nebulae. His empire thus extends from earth to sky, and whatever can be seen, whatever gives out light, that spectrum analysis has broken up into its elements. By the aid of spectrum analysis it is fully more easy to tell the composition of the sun and stars than it is to give the analysis of a simple terrestrial salt.

As early as 1675 Newton communicated to the Royal Society of London the results of his experiments in the decomposition of light. His diagram I show you upon the wall. It is simply a representation of a ray of light passing through a round hole in a shutter and into a darkened room, where it is made to go through a prism and fall upon a screen. It is thus broken into its component colours—red, orange, yellow, green, blue, and violet. Newton called this the “solar spectrum,” and in order to manifest that white light was in reality a unity of these coloured bands, he made this spectrum pass through another prism and reunite into a beam of white light. The electric spectrum can in a similar way be split up into coloured bands, and these can again be reconstructed into white light. Another point to which Newton called attention was the fact that each of the colours of the spectrum were monochromatic; in other words, they could not be further split up.

Sir David Brewster advanced a theory, that at least some of the colours of the spectrum were due to overlapping, such as the green, which was supposed to be produced by the yellow and the blue, but this has not proved to be correct. Helmholtz has conclusively demonstrated that each member of the spectrum is so to speak a primary and not a compound colour. I show you diagrams of how he arrived at this result. Light is due to undulations of the elastic medium pervading space, and is similar to sound in this respect, or it can be compared to waves on the sea. The size of the waves and the rapidity of their motion determine their action upon the eye nerves, and cause the sensation of colour to be sent to the brain, which receives the impression. While we may speak of light being like sound in its action, the power of the brain determining it is not nearly so delicate. A human being may hear eleven octaves from the deepest bass of sixteen vibrations per second up to the highest note, which is caused by some 4,000 vibrations per second of time; but the same individual only can see, so to speak, less than one octave.

Gentlemen, as a rule, are less able to distinguish between colours than ladies, or those who may be trained to determine between slightly different shades.

In the solar spectrum the red contains the greater portion of the heat rays, the yellow those of the light rays, and the blue the chemical rays. There is no actual difference in these rays except in the wave length, and in the intensity of the vibrations. The blue ray is the great agent in photography.

Wollaston discovered, or called attention to, the black lines which are observed to be numerous in some parts of the solar spectrum. Fraunhofer also made a study of these lines and mapped them. There are hundreds of them, their relative positions remaining the same under the same conditions whether these be associated with sunlight, moonlight, or the light of planets and stars, &c. All show black lines, and this fact makes it evident that there is in each instance something acting outside, and independent of our atmosphere. These lines are not simply the result of the passage of light through air, else they would be of different intensities according to the distance of the planet or star from our earth, and according to the relative position of the sun to the earth at various periods of the day.

Solid bodies when subjected to heat give out in succession red, yellow, and blue rays. A piece of iron when heated assumes first a dull red, changing into yellow, and latterly, under great heat, to blue. The same hold good with any other solid body.

I shall now heat a few metals in the electric lamp, and show you the various bands they throw upon the screen, and I wish you to understand that any particular band shown indicates that one particular element is present. Both the colour and position of the band must be noted, and, as a test, it is unfailing. We may also show that every gas has its own spectrum, and you can easily perceive how great and useful are the discoveries made in

\* A Communication to the Edinburgh Photographic Society.



connection with the spectrum. By its aid we can, for example, determine what elements we have in the sun, stars, nebulae, &c., which it would be otherwise impossible to analyse. Provided we have light from a celestial body, distance, however vast, makes no difference to the accuracy of the results. Not only can we thus tell which of the already known elements are present, but, by the spectrum, we can discover bodies which were previously unknown. As a stimulus to any one who may desire to be a great discoverer, I may mention that there is a strange band in the spectrum of Jupiter which indicates some element we as yet are unacquainted with.

You will have noticed that temperature has nothing to do with these gaseous spectra; gases, therefore, differ from solids in this respect. So long as a gas is a gas, or so long as the heat is sufficient to convert a solid into a gas, then the spectrum is permanent, and unchanged by any further addition of heat. Take sodium as an instance. This element can be compelled to give its characteristic yellow flame and band by means of the heat obtained by burning bisulphide of carbon ( $1295^{\circ}\text{C.}$ ) burning sulphur ( $182^{\circ}\text{C.}$ ), coal gas flame ( $2350^{\circ}\text{C.}$ ), carbon in oxide flame ( $3012^{\circ}\text{C.}$ ), hydrogen flame ( $3250^{\circ}\text{C.}$ ), oxygen hydrogen blowpipe flame ( $8061^{\circ}\text{C.}$ ), or the heat of the electric arc. At all these various temperatures the colour given by sodium is yellow, and the band in the spectrum is at the fifty line, from which point it never varies.

I have shown you that different gases and substances burn into different coloured flames, and that by close observation of the colour you may determine what is being consumed. I take a thin piece of wire and show you the colour of the sodium flame. This substance is very abundant in nature, and we need go no further than ourselves to at once obtain a supply of it. I put this wire in the flame of this Bunsen burner. After drawing it between my finger and thumb you see that a distinctly yellow flame results. That is the yellow of sodium which is in my body. You observe it burns a short time only, but I can renew it by again drawing my finger over the wire, or again if I wet it with my tongue, or a little dust from the floor will give the same flame.

To give you an idea of the extreme delicacy of these results, I may state that Professor Bunsen, whilst working on the chemical composition of the Durkheim mineral water, found, by means of the spectroscopy, some bands which could not be referred to any element then known. These bands were chiefly two bright blue bands accompanied by some red bands and two violet bands with two very bright red bands. These lines were afterwards shown to belong to two new elements called cesium and rubidium, but before sufficient material could be obtained to test these bodies in the ordinary wet way, 40 tons of water had to be evaporated, the resulting salts of which yielded some 200 grains of the mixed chlorides of these new elements. Now 40 tons of water are equal to 8,960 gallons—53,760 ordinary black bottles, or 4,480 dozen of quart bottles. From these figures you can see how extremely delicate these spectroscopic reactions must be.

I now show you the colours obtained from some substances which are gaseous at ordinary temperatures by passing the electric spark through glass tubes filled with them. A great improvement in this class of observation is due to Professor C. Piazzi Smyth. The older method of observing these phenomena was by taking the observation across the section of the light through the side of the tube. Professor Smyth conceived the idea of turning down the ends where the wires were attached, and so getting the increased advantage of the whole length of the tube by taking the observation end on. By this means a greater intensity of light is obtained, and a resulting greater delicacy of observation. This is one of the greatest advances in modern work.

In the solar spectrum the black lines have been shown to be due to the light of the incandescent elements passing through an atmosphere of their own gas, and by compelling similar conditions to exist I can here show you this absorption with a sodium flame.

Spectrum analysis is now being largely used for the detection of poisons, such as cases of death caused by coal gas, carbon in oxide, thallium, &c., and among its other applications may be mentioned its use in determining the shades derivable from a mixture of several auxiliary colours, &c.

By means of spectrum analysis we are able to tell that the sun spots, which at one time caused so much alarm, are craters from which large hydrogen jets are burning; that the moon and Venus have no atmosphere, whilst Jupiter and Mars have atmospheres;

that there is aqueous vapour in Saturn; that the nebulae are mere gaseous collections; that the comets contain carbon; that the coloured stars are so coloured because a portion of their light is obscured by absorption caused by gaseous elements present in the stars, &c.

To fully describe the many wonders revealed by spectrum analysis, many nights would be required. This evening, at best, I have only been able to give you a very general and hasty glimpse at the subject. We can well understand the benefits now derived from the patient hard work of the German, Professor Bunsen, who gave the spectroscopy birth. He is now far advanced in years, and although honours have been heaped upon him at home and abroad, he is still the same simple-hearted, one-minded, lovable man. His students adore him, and well they may, for he has given his life for the advancement of their interests, and his only desired reward is their good.

## ORTHOCHROMATIC PHOTOGRAPHY, OR THE PHOTOGRAPHIC RENDERING OF COLOURS IN MONOTONE.

BY W. BEDFORD.\*

NOTWITHSTANDING all that has been written on the subject, it must be admitted that orthochromatic photography makes but slow progress, and this no doubt is due to more causes than one; but it can hardly be denied that the almost universal adoption of gelatine dry plates is one of the most potent. The maximum effect of dyes on the haloid salts of silver is seen to most advantage when an excess of soluble silver salt is present, and both wet plates and the collodio-bromide process, in which the sensitive salt of silver is produced under this condition, undoubtedly lend themselves better to orthochromatic effects than the modern process which has well nigh superseded them. Braun, of Dornach, has practically shown by his re-production of paintings in the National Gallery what can be done by the wet process, while the researches of Vogel and Waterhouse, Ives and Abney, into the characteristics of orthochromatic collodio-bromide emulsion are reckoned amongst the classics of photographic physics.

It is now, I believe, acknowledged that Tailfer and Clayton, in 1893, were first in describing a practical orthochromatic process applied to gelatine plates and emulsions, while all the most successful formulas subsequently published seem to have their origin in what is now known as the eosin patent. At the same time the patentees explained that "the difficulty hitherto experienced in the application of eosin to the gelatino-bromide process arises from the fact that eosin gives no result unless it is introduced with ammonia (or some other alkali) as a vehicle;" and, although the full extent of this claim has been contested, no one, so far as I am aware, has given us a practical process whose results can compare with those where the dye is dissolved in ammonia.

In my first few experiments with Tailfer and Clayton's eosin process I met with no success, no doubt owing to the fact that the only samples of eosin and erithrosin I could then obtain had no chemical affinity for the haloid salts of silver in the emulsion, and it was not until Mr. Edwards gave me some of the eosin he used himself that I secured the result I was aiming at, although I had obtained a certain amount of orthochromatic effect by the use of a soluble chlorido in conjunction with these otherwise unsuitable substances. It is, however, gratifying to know that our English manufacture is not inferior to the foreign in suitability, as Mr. Spiller, about the same time, put me in the way of obtaining some erithrosin which is all that can be desired for the purpose, and which I have used in all later experiments with that dye.

I enter on the theoretical aspect of the subject with some diffidence, but would point to the fact that the emulsions I shall speak of have been prepared with excess of soluble bromide, which was more or less removed in the subsequent operation of washing. The fact that these emulsions, after washing, have colour sensitiveness, seems to point to the conclusion that there is a chemical combination between the dye and the silver haloid. If, on the other hand, there is no such chemical combination, the colouring matter is eliminated and the orthochromatic property with it.

By this process of preparing orthochromatic emulsions it is only necessary that a dye should be used which, in the presence of soluble bromide or chloride, forms an insoluble compound with the haloid salt of silver, capable of colour sensitiveness after washing.

\* Read at the Technical Meeting of the Photographic Society of Great Britain.



In order to establish Captain Abney's theory it seems necessary to contend that, previous to the action of light, the combination is not a chemical one, but is merely mechanical, or at most of the nature of a lake, if indeed it is conceivable, under any circumstances, that such opposing actions as oxidation and reduction can be working simultaneously in the sensitive film.

If we hold that there is a chemical combination between the dye and the silver before exposure to light, it is only necessary to infer that the compound substance is more easily reducible by the less refrangible prismatic rays than is the haloid salt of silver *per se*; and this view is strengthened by the fact, pointed out by Wellington, that substances such as methyl-violet give perfect freedom from fog when previously treated with an oxidizing agent. Moreover, orthochromatic emulsions or films treated with potassium dichromate do not lose their colour sensitiveness. If this were not the case, orthochromatic plates would be of little commercial value, as they would not keep, but would give fogged images after exposure to the oxidizing influence of the atmosphere. Fortunately, facts point to an opposite conclusion. I have some of Edwards's isochromatic plates, prepared nine months ago, which are now as good as ever.

The three substances I shall direct attention to, and by which these results have been obtained, are erythrosin, methyl-violet, and cyanine. Erythrosin gives increased sensitiveness for green and yellow, but absolute insensitiveness for red; methyl-violet and cyanine, especially cyanine, sensitize for orange and red.

Although it is thus possible to make an emulsion sensitive to all the colours of the spectrum, it must be borne in mind that all the rays have not the same chemical energy. It is, therefore, necessary, in order to render all colours in their due gradation, to expose the plate to white light through a coloured medium, or else to a coloured light, which will reduce the chemical energy of those colours which would otherwise be too vividly impressed.

This piece of uranium glass, a highly fluorescent substance, has a powerful effect as a screen in cutting off the higher rays. A most convenient and very efficient medium to use is turmeric collodion, which may be easily applied to, or removed from, the concave surface of the lens; and, until opticians provide optically orthochromatic lenses, I shall be content with coating one of the surfaces of the lens with dyed collodion.

The following is a tabulation of the results obtained on plates coated with the three different orthochromatic emulsions, as well as on ordinary plates, all exposed both with and without the coloured screen:—

		Blue.	Green.	Yellow.	Orange.	Red.
1.	Ordinary plate	1	4	2	3	5
2.	Do. with screen	3	2	1	4	5
3.	Erythrosin	2	3	1	4	5
4.	Do. with screen	3	2	1	4	5
5.	Methyl-violet	1	5	3	2	4
6.	Do. with screen	4	2	1	3	5
7.	Do. with double screen	4	2	1	3	5
8.	Cyanine	1	5	3	2	4
9.	Do. with screen	4	3	1	2	5
10.	Do. with double screen	5	3	1	2	4

It will be seen that the result in each case is different, except 6 and 7, which are equal. Which of all is most correct is, I find, a matter of individual opinion.

For the preparation of the emulsion I propose to give a formula for erythrosin, but it is desirable, though not essential, to first be sure that it is thoroughly oxydized.

Dissolve ten grains of erythrosin (Brook, Simpson, and Spiller's), by the aid of heat, in a flask with ten ounces of water, and add twenty minims of nitric acid. When the dye is precipitated, collect and wash it on a filter. It is no longer soluble in water, but must be re-dissolved by pouring four and a half ounces of alcohol through the filter. You will then have an alcoholic solution of purified erythrosin at two grains to the ounce.

The methyl-violet and cyanine used had been previously oxydized with potassium dichromate, according to Mr. Wellington's instructions, and were added to the bromide in the same proportion as the erythrosin.

The formula stands as follows:—

A	Potassium bromide	...	...	135 grs.
	Erythrosin (purified) solution	...	30 "	
	Gelatine	...	20 "	
	Water	...	1,000 "	
B	Silver nitrate	...	170 "	
	Water distilled	...	1,000 "	

Both solutions are heated in a water bath to 150° F., and B slowly added to A while stirring. The vessel is then replaced in boiling water until the required degree of sensitiveness, judged by the colour, is attained. Half an hour's digestion in boiling water is usually sufficient for a rapid emulsion. 200 grs. of gelatine, previously soaked in water, are then stirred in, and the whole allowed twelve hours to set. It is then squeezed through a net, washed in running water for six hours, remelted, and in three days will be in ripe condition, though I generally myself try a plate at once, exposed wet, to ascertain if it is all right.

In the experiments with methyl-violet and cyanine, I have replaced five grains of the potassium-bromide in the above formula by three grains of ammonium-chloride, but in other respects the treatment is the same.

The erythrosin emulsion in my hands is far more generally sensitive than the methyl-violet or cyanine, and certainly renders the green better; but if it is essential to have red rendered lighter than blue, which is the orthochromatic crux, as in No. 10, one of the two latter dyes must be used, and preferably cyanine.

Other dyes than those mentioned, which give silver compounds insoluble in water, and soluble bromide, may be used, but I have found no advantage in them over those specified.

I offer no apology for bringing this subject before the Society, as it seems to be a reasonable proposition that a photographic process which will render all the colours of nature or art in their proper gradation of tone must be superior to one which falsifies the natural effect on the eye of the observer. The photographic and actinic values of colours should be as nearly as possible identical; or, to put it more strongly, photography should only be able to distort the truth when forced to do so by the photographer.

In the hope of attaining to this ideal, suppressing many failures, I have brought before you the results of a few out of numerous experiments made in orthochromatic photography, which branch of the science I cannot but look upon as a step forward towards the process of the future.

## Reviews.

PICTURES OF EAST ANGLIAN LIFE. Illustrated with thirty-two Photogravures and fifteen small Illustrations, by P. H. Emerson, B.A., M.B. Large folio; 150 pages (besides plates). Price £5 5s. (London, 1888. Sampson Low, Marston, Searle, and Rivington, St. Dunstan's House, Fetter Lane, E.C.)

THE former illustrated works of Emerson have sufficiently indicated the nature of his efforts to break through the convention in virtue of which so much just proportion of gradation is sacrificed to "sparkle;" and all we need say on this head is to record the fact that the illustrations of the work before us bear evidence that their author is still aiming in the same direction, and is bent upon redeeming photography from the reproaches so often cast upon it by artists; or should we not rather say that the reproaches are really cast upon photography by its own practitioners, and are put in words by the artists who criticise? Time was when the sort of thing that took the highest honours at a photographic exhibition was a garish combination of exaggerated pieces of attitudinalism; but photographers themselves are beginning to exercise a better taste.

The author, in his wanderings, evidently makes friends rather with the peasants and the workers, than with the exalted or proud, of the low counties; and those who think that a county book should be mainly filled with records of the doings of the so-called "County Families," and illustrations of their houses, tombs, and archives had better not peruse "East Anglian Life." But those who delight in the tales of the ploughman, the sailor, the fisherman, the ardent naturalist, the poacher, and who can listen to a ghost story without feeling angered by "scientific" or materialistic contempt of the teller, should take an opportunity of reading the work under notice. We have, in short, a delightful history of the



inner life of the Norfolk and Suffolk peasant, and of the things dear to him, illustrated by such a series of truthful nature-pictures as is approximated to in no other work of which we know, unless in Emerson's earlier series.

The plate which we like far and away over the others is No. IX., "The Farm by the Broad," in which a faggot-carrier wends his way cottagewards amidst an effect of tree, air, and wood which quite recalls the most characteristic work of Turner.

The block illustrations in the text by Dawson are apparently by some method analogous to the Pretsch process, give useful emphasis to the text, and add much to the value of the work; of these, "Poacher Hiding," and "Fisherfolk at Home," being perhaps the most striking.

We should much like to see a cheap edition of the text published, even if without illustrations; but such a work might be embellished with the block illustrations, and also typographic reproductions of the more important plates.

### Notes.

The Exhibition of the Photographic Society of India, recently held in Calcutta, may be considered as in every way a success; the leading photographers of the world having contributed. Colonel Waterhouse, William Jobbins, and Colonel L. Kemp acted as judges, and the following are the awards, the names under each heading being given in the same order as in the Judges' report.

*Gold medals*—G. West and Son, for "Sailing Studies"; Harry Tolley, for "On the Lonely Shore"; and W. Hoffman, "Portrait of a Child." *Silver Medals*—H. P. Robinson, A. Boissonnas, J. McMichael, G. M. Elton, G. Davison, George Ewing, J. S. Gladstone, the Countess of Dufferin, George Lyell, the Bara Thakur Bahadoor of Tipperah, and R. Y. Remfry. *Bronze medal*—C. R. Pancoast.

English contributors generally sent numerous examples of work, and among the medallists for this country we may mention Messrs. West as sending thirteen exhibits (all yacht studies), but Mr. Tolley only sent two, while Mr. Robinson contributed "A Chat with the Miller," "He never told his Loye," "Feeding the Calves," "All in the Downs," "Carolling," "The Music of the Birds," and "Wayside Gossip." George Davison sent no less than fifteen, namely, "In Port," "Little Misery," "Country Cottage Study," "A Breezy Day in Spring Time," "Country Cottage Study," "A Pretty Hop Picker," "Three Old Men of Rye," "Fine Fresh Herring," "A Thirsty Morning," "An Old Barn," "I Spy," "Group at Ferry House," "Country Cottage Study," "Let not Ambition," and "Mending Nets."

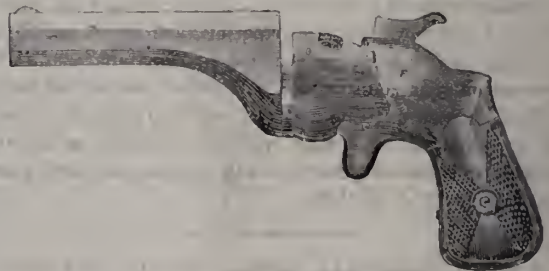
A curious hoax has been perpetrated upon an Italian sculptor in Naples. It seems some American joker gave him a photograph which he said was the wife of the President, telling him that if a good marble bust were made, it would be purchased at a handsome figure. The sculptor eagerly adopted the suggestion, and in due time

sent the bust to a friend in New York to dispose of. When it arrived, however, it was found not to bear the least resemblance to Mrs. Cleveland, and the friend to whom it was consigned is now carefully examining the faces of New York ladies to find, if possible, the original, and so make a sale probable. In the meantime, the bust has been placed in a fashionable restaurant, where it attracts considerable attention.

The French know how to appreciate the value of the public's acquaintance with the features of a popular favourite as an important factor in that popularity. Many millions of photographs have been distributed from time to time of the principal members of the Buonaparte family, and the same plan is being adopted with regard to Boulanger; upwards of two million photographs having been sent out by the new journal established to support the ex-Minister of War. The taste for portraits does not appear to have been created by the sending out of the photographs; it would seem to be a craving natural to the French people. It is significant that while Boulanger was still Minister, a company was formed which cast 45,000 large metal busts of him to be sold on his becoming the ruler of France.

Interested exhibitors at the next Pall Mall Exhibition will be interested in knowing the new law which is to come into effect this year at the Paris *Salon*. It is that any artist who is dissatisfied with the hanging of his pictures may take them, or any one of them, away. We fancy such a rule as this would be welcomed by the hanging committee of the Photographic Society. Never a year passes but what there is a host of grumblers, and such a law would bring the matter to a practical test. It would be interesting to know whether all or any pictures would be removed. Perhaps in all exhibitions the majority of pictures which are "skied" would not be missed. But we doubt if the artists, if they had the option, would take them away.

There is a curious tendency towards the making of photographic apparatus in the guise of firearms, and the latest example of this is afforded by the Photogenic Pistol, which Anthony & Co., of New York, are adver-



tising. We have not yet seen the instrument itself, but reproduce the woodcut.

The pistol in question is an arrangement for firing off magnesium cartridges for photography at night, and one



of the cartridges fired from the pistol will, they say give light enough for taking a portrait or a small group. Perhaps we may, before long, be able to say something about the Photogenic Pistol from personal experience with the article itself.

Another artificial light producer is advertised by Anthony and Co., the "Instantaneous Flash Magoesium Tablet." They say: "For use, place a tablet on a brick or iron plate, and light with a wax taper or otherwise, keeping the hand at least one foot from the tablet." The tablets can only be sent by express, and not by mail or with other freight goods, so we suppose they may be somewhat dangerously explosive; and considering the scare legislation which now holds good as regards explosives in Great Britain, it might be rather risky to possess the magnesium tablets.

An illustration is recently issued with the *Cyclist* by a modified collotype process called "Photophane," the working of which is, we understand, under the agency of Iliffe and Sons, of Coventry. Henry Sturmey, editor of the *Cyclist*, informs us that 8,000 copies have been printed from one plate—a good record, considering that five, six, or seven hundred is considered a very good yield for an ordinary collotype plate.

Amateur photographers who intend visiting the Riviera may as well leave their apparatus behind, if what a correspondent of the *Globe* says is true. The spy mania here, it seems, is rampant, and crops up continually in the most annoying fashion. Just where the most lovely views abound, you are met with a notice-board with *Enceinte Militaire défense de Circular*, and a sentry round the corner to see that the order is carried out. Of course you are balked of the view, and under such circumstances, says the correspondent, the use of a sketch-book or a photographic camera would simply result in a prison.

Many interesting points are involved in the paper on magnesium lights by P. Swanson, which is to be found on p. 227, and those who did not read his earlier paper, p. 37, of present volume, should turn back to it.

Orthochromatic photography is the subject of much thought just now, and the paper of Bedford on p. 230, is specially interesting, as bearing on a patent claim in connection with the subject; this skilled worker not being able to succeed until he had received help from the owner of the patent. We may refer to a leading article on p. 225, in which reference is made to some surfaced glass screen sent by J. R. Gotz.

#### A NEW COMMERCIAL APPLICATION OF OXYGEN.

BY THOS. FLETCHER.\*

THE want of some simple method of obtaining a powerful source of heat under perfect control is an experience, and often an unpleasant one, which all who have charge of machinery and chemical plant must have felt more or less frequently. Up to

the present time the only practical methods have been either by the use of a basket of live coke, or a blowpipe connected to the nearest gas supply. Neither of these methods is satisfactory in many cases, and to overcome the difficulty I have devised some special forms of blowpipes which can be used with the ordinary coal gas supply and compressed oxygen made by the Brin process. These blowpipes are essentially different from the usual form, and also from the well-known mixing jet, the latter requiring both gas and oxygen to be equally compressed, which at once excludes it as an emergency arrangement for repairs and accidents. It is pretty well known that air gas produced from gasolite vapour, when used with an air blast in a blowpipe, is peculiarly liable to be extinguished; the speed of combustion is sufficiently slow to enable the flame to be blown out or away from the unburnt vapour with the greatest ease, probably owing to the fact that the gasoline is not diffused through the air as a true gas, but as a vapour, which requires further heating and considerable expansion before it will burn. On this point I have a rather pretty experiment here, showing you the particles of vapour in the so-called air gas, burning separately, the flames of the separate suspended beads of gasoline vapour being distinctly visible as independent centres of combustion. When we apply an oxygen blast to gasoline vapour this brittleness or want of persistence disappears, but owing to the air mixed with the vapour, the temperature obtainable is far lower than that from permanent combustible gases, and up to the present time high temperatures have not been obtained with blowpipes using the light petroleum, owing to the necessary mixture of air to obtain the vapour. We must not forget, when gasoline or benzoline vapour is used, that it has one special point in its favour for some classes of work in the fact that the products of combustion are quite free from sulphur, which in many ways is a great source of trouble in laboratory work. The use of a petroleum or spirit spray, if it were practicable, would overcome the difficulty of the admixture of air; but the spray formed by an oxygen blast is of a most unpleasantly uncertain and explosive nature, so much so that after my own experience I can only give a strong caution as to the excessive care required to prevent disastrous accidents. A spray burner may start and work satisfactorily, and then suddenly, without any apparent cause, the whole apparatus may be shattered into fragments. When we burn a permanent gas, such as hydrogen or coal gas, in a blowpipe with an air blast, the flame will bear a heavy air pressure on the jet, giving a correspondingly high temperature flame. If we take the same permanent gas, and use it with a jet of oxygen instead of air, the persistence and "toughness" of the flame is again greatly increased, the speed of traverse of flame backwards is so great that the amount of combustion which may be going on in a given space is almost unlimited, and enormously high temperatures can, therefore, be obtained with the greatest ease, the absence of nitrogen in the flame, of course, greatly assisting the result by reducing the loss of heat, and we gain also by the area of flame containing a given number of available units of heat.

In the construction of powerful blowpipes for compressed oxygen, and coal gas at ordinary pressures, the form of the jet is a very important matter. The centre jet, instead of being formed with a single hole (except in the very smallest sizes), should be flat on the end, and drilled with a circle of very fine holes, each large enough to pass from three to four cubic feet of oxygen per hour at a heavy pressure. The gas outlet which surrounds this jet should be an annular space about  $\frac{1}{8}$  inch wide surrounding the jet, and should project  $\frac{3}{8}$  inch beyond the tip of the jet, this projection being the same in all sizes and powers. Such an arrangement is useless for a gas and air blow pipe, as it extinguishes itself instantly, and some amount of experimenting has been necessary to arrive at the details now given. I have here three sizes of these blow-pipes, requiring respectively 7, 20, and 40 cubic feet of oxygen per hour; and with a small bottle of compressed oxygen, which can readily be carried under the arm, I will now give you some idea of their power. The quantity of oxygen required for each has not been measured by myself, but has been estimated from a bottle supplied by the Brin Oxygen Company, which I was informed contained 20 cubic feet, and which supplied the largest blow-pipe at full power for half an hour continuously. The smallest of these blow-pipes will fuse the end of a 3-16 wrought-iron rod; the next size will do the same with a  $\frac{1}{2}$ -inch wrought-iron rod, or will braze copper pipes  $\frac{1}{8}$  inch thick about as quickly as a tinman can soft solder light sheet tinned iron. The largest will fuse a hole through a 4-inch wrought-iron steam pipe, and will braze, and probably also weld,

\* A Communication to the Society of Chemical Industry.



heavy flanges and couplings on work of the same size. Larger blow-pipes can be easily made on the same lines, and it is now both possible and easy to braze and make repairs in parts of complicated machines without removal, in any place into which a man's hand can be got. The heat is so short and so quickly obtained that, with the assistance of wet cloths, polished work or wood lagging can be preserved without injury or mark, within two or three inches from a place where a heavy brazing repair has been done. Breakdowns in copper pipes or vessels can be made good and work restarted in a few minutes which under ordinary conditions would necessitate a stoppage for days. Using the same blowpipe and bottle of oxygen, I will show you, with a block of lime, an emergency light which will often be found useful; amongst other things it will enable you to get by photography a permanent record of any accident or unusual state of things in places where no natural light can be obtained, and where magnesium would fail owing to the dense fumes evolved. This light is, of course, anything but silent; but, as we are now considering only works emergencies, the noise is not of any great consequence.

(To be continued.)

## Patent Intelligence.

### Applications for Letters Patent.

- 4,510. JOHN EDWARD THORNTON, 3, New Lorne Street, Moss Side, Manchester, for "Photographic shutters."—March 24th, 1888.
- 4,545. WILLIAM CHARLES HUGHES, Brewster House, 82, Mortimer Road, Kingsland Road, N., London, for "Improvements in a new form of scientist's lecture lantern."—[Complete Specification.]—March 24th, 1888.
- 4,692. ALEXANDER HENRY REED, Suffolk House, Lawrence Pountney Hill, Cannon Street, Middlesex, for "A new or improved photographic dark chamber."—(Emil Heinrich Riedel).—[Complete Specification.]—March 27th, 1888.
- 4,823. SAMUEL PHILLIPS and ADAM STEPHAN, 28, Southampton Buildings, London, W.C., for "Improvements in lithography, photo-engraving, and other photo illustrative processes."—[Complete Specification.]—March 29th, 1888.
- 4,839. CHARLES GOLDSMITH and JOHN HENRY STAFFORD, 6, Bank Street, Manchester, for "Improvements in apparatus for holding and changing the slides in magic-lanterns during exhibition."—March 31st, 1888.
- 4,874. ERNEST SIDNEY WILLIAMS, 41, Jones' Road, Drumcondra, Dublin, for "A method for producing photographic emulsions not requiring a base or support as photographic films."—March 31st, 1888.
- 5,055. ALFRED HART, 16, Upper Bedford Street, Brighton, for "Improvements in the production of dry plates for contact printing in photography, and using same for embossing purposes."—April 5th, 1888.

### Application for Amendment.

In the Matter of Letters Patent granted to JOHN HANCOCK, Junior, of 11, Eldon Place, Newcastle-on-Tyne, for the invention of a "Binocular camera," dated the 11th day of May, 1886, No. 6,316.

Notice is hereby given that the said JOHN HANCOCK, Junior, has applied under the provisions of the Patents, &c., Act, 1883, for leave to amend the Specification and Drawings of the said Letters Patent, alleging as his reasons for so doing "that in order that the picture may be sharply and clearly defined to its very limits."

The amendments proposed are as follows (reference being had to an officially printed copy of the Specification) viz. :—

On Page 2.

Line 9. Striking out "two" altering "lines" to "line," and "P" to "Z."

Line 18. Substituting "large lenses" for "sheets of clear glass."

Line 19. Substituting "red" for "three," and "J I" for "E," and striking out "shown at large in sketch on plan lettered E\*")."

Line 23. Adding to the end of the line "and placed nearer together centre and centre than the lenses lettered H G., J I are as in plan."

Inserting between lines 25 and 26, "Now place one large lens at W in plan."

Lines 26 and 27. Striking out "represented by the two lines lettered F."

Line 34. Substituting "large lenses" for "sheets of clear glass."

Line 35. Substituting "red" for "three," "J, I" for "E," and striking out "and shown at large in sketch on plan lettered E\*")."

Line 36. Striking out "lettered E."

Page 3.

Line 2. Inserting after "and," "lettered respectively V and K, and placed nearer together centre and centre than the lenses lettered H. G. J. I. are," and inserting "and also having one large lens at W" after "partition."

It is also proposed to alter the drawings.

A copy of the Specification in which the proposed amendments are shown can be inspected at the Patent Office.

Any person or persons intending to oppose the said application for amendment must give notice (on Form G) of his or their objections thereto, at the Patent Office, 25, Southampton Buildings, London, W.C., within one calendar month from the date hereof.

Dated this 7th day of April, 1888.

H. READER LACK, Comptroller-General.

### Amendment.

In the matter of Letters Patent granted to ALFRED JULIUS BOULT, of 323, High Holborn, in the County of Middlesex, for the invention of "Improvements in or relating to holders for photographic films" (a communication) dated 25th November, 1884, No. 15,542.

Notice is hereby given that with the exception of the excision of claim 13, which the applicant was allowed to retain, leave was granted on the 5th ultimo for the Specification of the said Letters Patent to be amended in the manner set forth in No. 419 of the Official Journal of the Patent Office, issued on the 14th January last.

The Specification has been amended accordingly.

Dated this 7th day of April, 1888.

H. READER LACK, Comptroller-General.

### Patent on which the Seventh Year's Renewal Fee has been Paid.

1,602 of 1881. H. A. STEINHEIL.—Photographic objectives.

Patent which has become Void through Non-payment of the Fourth Year's Renewal Fee.

5,947 of 1883. G. RYDILL.—Preparation of photographs.

### Specifications Published.

6613. SAMUEL WHITE ROUGH, Manufacturer of Photographic Apparatus, No. 180, Strand, London, W.C., for "Improved detective camera for artists."—Filed May 5th, 1887.

The Patentee says:—

This invention relates to so-called detective cameras. In carrying it into effect I make use by preference of an oblong wooden box in the front end of which is fixed a lens that is concealed from view, and across which passes a flexible opaque band having in it an aperture that permits the lens to be exposed to the view to be taken. This band is actuated by clock work or by a simple spring, the arrangement being such that when at repose the lens is covered. By the application of a key the spring is wound up, and is retained *in situ* by a click or catch dropping in a ratchet wheel; pressure upon the tail end of this catch by means of a button or knob accessible from without releases the catch, and causes the opaque band with its opening to pass rapidly across the axis of the lens and admit light for a momentary period.

At the posterior end of the camera is a recess capable of holding a number of sensitive plates, each of which is inserted in a sheath preferably of thin metal so constructed that while the back is quite protected, the face shall be exposed in all but a slight overlaying flap or band of the metal which shall prevent it from falling out or from being damaged by contact with others against which it may be pressing. When the recess at the back of the camera is filled with plates protected in the manner described, and the end is closed by its cover, springs in the latter press against the plates, and keep them tightly up against the ledge or faces forming the front of the recess.

The first plate of the series, or that which presses against the faces referred to, rests not upon the bottom of the camera, but upon a strip of wood or metal capable of being made to rise up by



guides or grooves in the sides of the camera. This is attached by means of an arm to an axle going across the camera, which axle is midway or nearly so between the position of the first plate and the lens. By rotating a key or thumb-screw at the side, the metallic strip on which the plate reposes is made to rise towards the top of the camera, carrying with it the plate which it supports, and which is now raised up through a slot extending across the camera into an opaque and flexible bag preferably of wash leather, which, while shielding the sensitive plate from the light, permits of its being grasped by the finger and thumb of the operator, and lifted entirely up from its place, when it is transferred to another and similar slot of suitable dimensions at the back of the supply of plates, through which it is inserted and pushed down behind the others. In the meantime, by the action of the springs in the back, the second plate of the series, on the withdrawal of the first one as described, is pushed forward, and takes its position against the faces of the recess. After exposure to light it too is withdrawn and transferred to the back, and so on in rotation until the whole series has been exposed.

It will be understood that the focussing is effected by having the lens attached not to the immoveable box to which the faces of the recess are fixed, but to either a moveable false bottom or a separate front capable of permitting the focus to be adjusted when desired, although in ordinary practice, when the lens is once adjusted for any object at a moderate distance from the camera no further adjustment is necessary. When required, focussing can be ensured by means of a sliding body to the camera on which is engraved or affixed a graduated strip representing the focussing value of an object situated at any definite distance.

When not in use the flexible bag aforementioned folds down in a recess, and is protected by a suitable cover.

In order to place the object to be photographed in proper position on the plate there is a back and foresight so adjusted that correct aim can be taken and perfect accuracy secured.

The apparatus can be arranged so that one or more additional nests of plates can be placed in position for use.

1201. ALFRED JULIUS BOULT, of 323, High Holborn, in the county of Middlesex, M.I.M.E., for "Improved photographic plate to be developed in water."—Dated, 26th January, 1888.

The present invention relates to improvements in photographic plates, and its object is to permit the plates to be developed in water instead of in a specially prepared bath.

To this end, the plates, previously covered with emulsion and dried, are coated on the back with developing substance rendered adhesive, and preserved against oxidation by the following process:—

The back of the plate is entirely covered with the following mixture:—

* Heated gallic acid or other suitable reducing substance...	10 grammes
Salicylic acid ... ..	1 gramme
Gum arabic, dextrine, gelatine, collodion, or other varnish-like substance ... ..	10 grammes
Alcohol ... ..	5 cubic centimeters
Water ... ..	20 " "

The plates are dried at an ordinary temperature, and the negative is developed by immersing the plate in water containing a small quantity of ammonia.

The proportions of the mixture may vary according to the quality of the emulsion.

The addition of ammonia may be rendered unnecessary by coating one half of the back of the plate with the above described mixture, and the other half with a liquid obtained by digesting a solution of sugar of 25 per cent. with an excess of slaked lime by filtering, and then adding to 100 cubic centimetres of this liquid, 15 grammes of sugar, and 25 grammes of gum arabic.

The plates are dried at an ordinary temperature, and the negative is developed by immersing the plate simply in water.

Having now particularly described and ascertained the nature of the said invention, as communicated to me by my foreign correspondent, and in what manner the same is to be performed, I declare that what I claim is:—

The coating of the back of photographic plates with suitable developing substances rendered adhesive and preserved against

\* Our readers will recognise this as an obvious slip in translation for pyrogallie acid.—ED. P. N.

oxidation by the aid of the above described process, substantially as and for the purpose specified.

5923. GEORGE SALLNOW MARTIN, Birkbeck Institution, Breams Buildings, Chancery Lane, Optician, for "Improvements in photographic shutters."—Dated April 23rd, 1887.

The special feature of invention is one long spring at the side of shutter, acted upon by air-piston at the lower end, which releases a small brass or ebonite shutter pulled upwards by a spring—there being a small pin or notch which allows a projection on the top of side spring to catch a small pin projecting from side of above shutter, enabling the operator to detain it at will.

## Correspondence.

### DIFFUSION OF FOCUS.

SIR,—In a letter which appeared in your issue for March 30th, I pointed out that a communication from Mr. Chapman Jones, which had appeared the week before, was calculated to confirm photographers in an old standing fallacy, and particularly referred to a statement quoted by Mr. Jones in support of his views, from Lake Price, who spoke of spherical aberration as "increasing the depth of perfect focus," and added that if Mr. Jones recognized that this statement was a mistaken one, it would have been more candid to say so.

Mr. Jones does not even now say whether or not he recognises the error of this assertion, but endeavours to throw a charge of want of candour on me, by suggesting that I imply that a proportional lowering of definition is caused by the introduction of spherical aberration. I never suggested anything of the kind. If the definition were lowered proportionally, the want of sharpness would be so outrageous that no one would have the temerity to recommend it. The fact is, that with so-called diffusion of focus, definition is lowered not only in the focal, but in the out-of-focus planes. In the latter, an additional amount of want of sharpness—which at the focal plane would be very evident—is not so much noticed, and the eye is therefore not so much struck by their contrast with some places of sharp definition. With those who, with Petzval, argue that on this ground the introduction of spherical aberration is sometimes advantageous, I have no quarrel—it is a matter for individual taste—but I do protest against photographers being misled by being told that by sacrificing sharpness at the focus they gain definition in the other planes.

Mr. Jones rests his case upon the number of published opinions which he has been able to find on the one side, but professes himself unable to judge between the conflicting statements of Grubb and J. H. Dallmeyer. This being the case, it is not easy to see why he should have intervened in the discussion.

To quote opinions of photographers as an authority on matters which are susceptible of mathematical proof or of direct experiment, is an absurdity; but if any one feels dissatisfied with Grubb's mathematics, which have not till now, I believe, been called in question, let him make a practical experiment by focussing the centre figure of a Claudet's focimeter, and then take two photographs, one with, and one without, the so-called diffusion of focus. It will at once be seen whether the out-of-focus planes are improved as claimed, or not, by the "diffusion" arrangement.

Mr. Jones says that the question is a difficult one to settle by means of diagrams, because of the unequal illumination of the circle of confusion when spherical aberration is present. Grubb recognized the last-named fact, but showed that if in some planes the illumination is concentrated towards the centre of that circle, in others the concentration is towards the margin, whilst the circle of confusion itself is, on the average, larger. This difficulty, however, did not deter Mr. Jones, in a lecture delivered at the Birkbeck Institution, and published in the



PHOTOGRAPHIC NEWS for October 7th of last year, from producing a diagram by means of which he professed to show that the image of a point nearer than the focussed plane covered no greater space on the sensitive plate when spherical aberration was present, than when absent. This, if, as must be presumed, referring to spherical aberration and depth of focus generally, and not to an object placed so as to suit the curvature of field in one case, and not the other, is very misleading. The light is concentrated towards the edge of the circle of confusion for nearer objects, and the circle of confusion itself is very much larger for more distant objects. Why were these facts left out of account?—Yours, W. E. DEBENHAM.

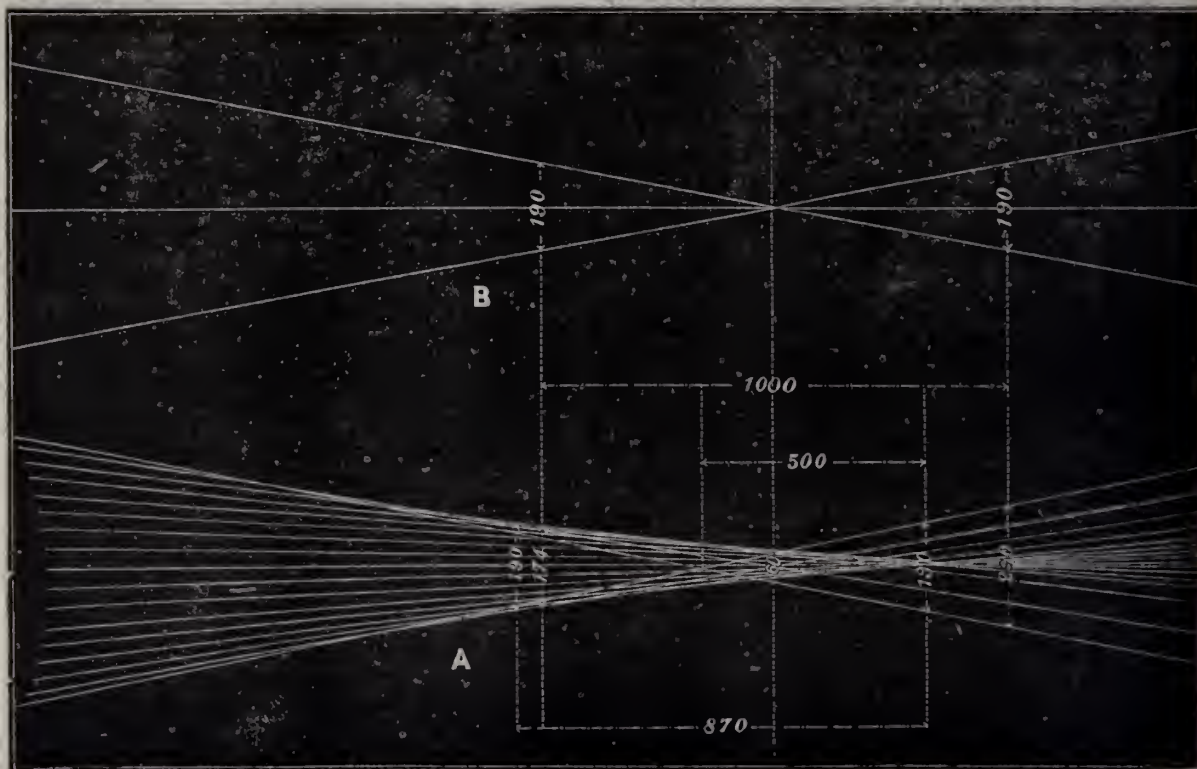
#### DIFFUSION OF FOCUS.

SIR,—Mr. Chester Jervis' letter, with its forensic quotation, recalls to my mind an anecdote, the kernel of which is that quotation, and equally applicable to the subject under discussion. A certain eminent judge at the hearing of an extremely technical case was, to the no small concern of the leading counsel then addressing the Court, seen to

nod in a dangerously soporific manner, at the critical moment when the chief weight of his argument should tell. The counsel required the judge's full attention, and in his most stentorian accents exclaimed, "The case appears to me, gentlemen of the jury, to resolve itself into one of *caveat emptor*, as they say in Greek!" This aroused his lordship, and drew from him the profound remark, and in measured tones, "When I was at school, Mr. Blank, I was given to understand that those words were Latin." "Certainly," replied the counsel, in his airiest manner, "Latin to you my lord, but Greek to the jury."

The subject of "diffusion of focus" is "Latin" to some, but appears very much "Greek" to others.

I should have replied to Mr. Debenham's letter before, but thought it proper for Mr. Chapman Jones to answer for himself first. The latter gentleman has dwelt upon the practical benefits derived from the power placed in the hands of a photographer, when employing one of my late father's patent portrait lenses, of introducing for artistic effect a certain amount of positive spherical aberration, and thus equalising indistinctness in out-of-focus planes, and avoiding extreme contrast, as would be the case if the lens



were used intact; and his letter in your last week's issue includes all that I might have been obliged to add further on that head.

As regards the theoretical aspect, I am very pleased that I can meet Mr. Debenham upon his own ground, for at the time of reading the paper published in your last week's issue, I did not wish to enter into the discussion that followed then, being unaware of the source of Mr. Debenham's quotation from the late Mr. Thos. Grubb, wherein he says: "In whatever way we may make these comparative measurements, provided it be fairly done, we shall find the advantage of depth of focus to be on the side of the corrected lens." Mr. Debenham, however, does not fairly nor accurately quote the context of my remarks when he says: "The claim has been shown to be unfounded,

and, indeed, may be taken to be abandoned by Mr. Dallmeyer himself, when in a recent paper he calls it absurd to speak of some lenses having more depth of focus than others." What I did say, and am reported to have said, is as follows:—"In comparing lenses of identical foci and intensities, it is absurd to speak of one having more depth of focus than another, if both are free from spherical aberration, and used under the same conditions."

For the fuller information of your readers, it will be best to reproduce the diagram under discussion.

First, as to the term, "diffusion of focus."

From a scientific point of view, I think no expression could be happier. For the sake of simplicity, suppose the images given in the diagram B and A represent the course of rays from two single lenses: B perfectly corrected for



spherical aberration, A imperfectly corrected. The lenses themselves may be considered as an infinite number of prisms in close approximation. In the lens B, all the rays cross in the axis at one point, every other point along the axis being entirely out of focus. In the lens A, the ray from the extreme edge crosses the axis at a point very much nearer to the lens than a ray close to the axis itself. Taking the drawing as exact, the measurement will be a locus of 500 measured parts along the axis, the nearest focal point to the lens being 170 measured parts in advance, and the furthest 300 measured parts beyond the least circle of confusion. Comparing the two cases, it is apparent that the absolute focal point at which all rays cross, as in the lens B, is, as it were, spread upon the axis, the limits of the foci of the extreme rays being both within and beyond the best focus obtainable. In the imperfectly corrected lens, then, there is a distance corresponding to 500 measured parts upon the drawing at which points are defined by certain definite portions of the uncorrected lens; whereas in the corrected lens they are all brought to one point only in the axis—in the former case, the resulting partial definition having given rise to the term diffusion of focus.

Secondly, looking at the measurements as made by Mr. Grubb, he distinctly shows that for the uncorrected lens on the side of the locus of least confusion within the focus, there is a gain of 16 parts,—174 as against 190. Now it appears to me that this is the point of view as regards gain in depth of focus for the uncorrected lens on the ground of the diameters of circles of confusion, for on this side of the best focus the gain is not relative, but absolute. Again, it is from this point of view that Mr. Debenham and photographers generally must be convinced that absolute advantage does occur. I have pointed out, and I believe it is generally admitted, that spherical aberration should not be introduced except in the case of portraiture. I should imagine that Mr. Debenham or any photographer would focus for the main object of interest, and look for as much depth beyond that point as could possibly be obtained, paying as little heed as possible to the foreground. Now according to Mr. Grubb's own drawing, if a point were absolutely focussed for, the gain in depth for objects beyond that point is clearly demonstrated, although in the uncorrected lens, no point is absolutely defined, yet there is only a difference between the diameters of the circles of confusion of 104 measured parts, as against 190 in the corrected lens.

If it were necessary to obtain an equal amount of depth both before and behind the main point focussed for, then I say, on the ground of circles of least confusion, Mr. Grubb has clearly maintained his point. However, as far as I understand, the particular application of the principle involved for practical benefit in photography, the subject should be treated from this particular aspect. The question of concentration of rays on either side of the focus, as regards the resulting image, is one which can only be discussed from the standpoint of results, although, as I have pointed out before, in any case there are wider limits of partial definition in the uncorrected lens than in the corrected.

The whole principle involved is to bring about greater equality of indistinctness, and I have clearly shown that the advantage rests with the lens imperfectly corrected for spherical aberration.

Many of your readers may be unaware that this subject was thoroughly discussed about the time of the late Mr. Grubb's paper referred to, when other methods for arriving at the same or similar results by mechanical means were suggested, such as that of the late Mr. Claudet. Some people still adopt that method, namely, of moving the lens or camera slide, as the case may be, during exposure. It is, however, generally considered to be clumsy and uncertain; but with regard to the principle under discussion, I can only add that its utility has been proved by results. It was appreciated at the time of its introduction

by my late father, and has continued to be appreciated ever since.—I am, sir, yours, &c., THOS. R. DALLMEYER.  
25, Newman Street, W.

## Proceedings of Societies.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE usual weekly meeting was held on the 5th inst. H. P. EVERETT occupied the chair.

The CHAIRMAN, referring to transferotype (the development of which had been demonstrated at the previous meeting), said, according to Captain Abney's work on photography, a similar process had some time ago been patented by L. Warnerke.

J. ADAMS proceeded to develop some Vergara gelatine films. Any of the ordinary developers could be used. In the present case, pyro and ammonia was employed. The film, after development, was placed in methylated alcohol, after which it dried in a few minutes, and was handed round. The film was perfectly clear and transparent, and the surface perfectly smooth and free from any tendency to cockle. In reply to several members, he (J. Adams) said the support of the sensitive film consisted of a thin sheet of bichromatised gelatine. A large glass plate, having been previously polished with chalk, is coated with the gelatine, dried, and exposed; it was then passed through a bath of a ten per cent. solution of sulphurous acid, and dried; this was to clear it of the yellow stain of the bichromate. It was now ready to be coated with the sensitive emulsion. After drying, it stripped readily from the glass plate. There was perfect adhesion between the sensitive film and the bichromated gelatine. The negative could be printed from either side; practically no difference would be found, except where the detail was exceedingly fine.

W. H. HARRISON remarked that the films of M. Balagny, of Paris, were very popular in France, and they seemed to be very similar to those now shown.

A member asked if the films, in drying, had a tendency to shrink.

J. ADAMS said that difficulty had been overcome by using less gelatine in the emulsion. With regard to halation, they were practically quite free from that. An objection had been raised to the films not being in rolls for use in a roller-slide. As manufactured now, they are too thick to roll. To meet this objection they would have to be made much thinner, which would be a disadvantage.

W. H. PRESTWICH exhibited an opal bromide plate that had been printed-out in the camera. The exposure was about an hour or rather less, using a 2B lens. He anticipated, from a course of experiments that he was then engaged in, being able to produce a much more sensitive plate for printing-out in the camera.

F. W. HART showed some prints of interiors, taken with the flashing light, apertures  $\frac{1}{7}$  and  $\frac{1}{8}$  being used. The pictures were fully exposed.

T. P. Sugton was elected a member of the Association.

### NORTH LONDON PHOTOGRAPHIC SOCIETY.

AT the ordinary meeting on April 3, J. TRAILL TAYLOR President, occupied the chair.

In response to an invitation to exhibit results of the previous day's outing, Mr. Cossor passed round two negatives, several members saying they had not yet developed their plates.

Mr. MEDLAND showed an improved form of Newman's shutter. It was now possible to give an exposure of one one-hundredth of a second with the larger sizes of shutter without there being any appreciable shock. A picture of ducks feeding, taken with the most rapid exposure, testified to the efficiency of the new shutter.

W. BISHOP then gave a demonstration of the new Eastman transferotype process. He commenced by giving an outline of the process, saying that the special paper used could be treated as ordinary bromide paper up till the point of transferring—that is to say, that contact prints or enlargements, or reductions in the camera or lantern, could be made upon it before transferring, care being taken that when the image was to be transferred direct to the permanent support, that the negative was so placed as to secure a non-reversed image in the final stage. The picture, being developed and fixed, was squeezed down on to the support of paper, wood, opal, metal, or whatever substance may be



desired, the image and its support were then immersed in hot water, and the paper backing stripped off, leaving the gelatine film on its new basis. It was then gently washed with cotton-wool or a camel-hair brush, to remove the surplus gelatine, which had formed the soluble substratum on the paper. Mr. Bishop now proceeded to develop and transfer several pictures, and showed the effect of too prolonged soaking, and too vigorous cleaning off of the excess of gelatine. He purposely destroyed one of the pictures to show how this resulted in rubbing the image-bearing film into holes. It was very necessary to warn the beginner against this error, as he had himself spoilt several pictures in his early experiments.

Mr. READER asked if various tones could be obtained with this process.

Mr. BISHOP said that he had not tried to obtain any but the ordinary black tone of bromide prints. He pointed out the suitability of the process for making opals, as in case of failure the opal was again ready for use without the expense of sending it to be recoated with emulsion.

F. W. HART showed a transferotype transparency which had been coated with dammar varnish, and baked in an ordinary oven for two hours. The picture was uninjured, and the varnish was of course thoroughly stoved.

JOHN JACKSON said that, as he represented the Eastman Company, and was, moreover, the first person in this country to work the process, he was in a position to give a good deal of information regarding it. The transferotype paper was coated with the same emulsion as the Company's A, B, and C papers, with this difference, that the paper was first coated with a soluble gelatine substratum. The transferotype paper required an exposure of about twenty seconds, at one and a half feet from an ordinary gas burner, with a negative of medium density, while reductions in the camera required from thirty seconds to two minutes, according to circumstances. Although the ordinary ferrous oxalate developer is recommended, the film is amenable to treatment with any recognised dry plate developer. The pyro and soda developer being particularly suitable, the formula is as follows:—

Sulphite of soda...	...	...	...	6 ounces
Hot water	...	...	...	32 "

Allow it to become thoroughly cold, acidify with citric acid, and add—

Pyro	...	...	...	1 ounce
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Filter, and label Solution No. 1.

Carbonate of soda	...	...	...	3 ounces
Carbonate of potash	...	...	...	1 ounce
Water	...	...	...	32 ounces

Label Solution No. 2.

To develop, take one part each of Nos. 1 and 2, and two parts of water, with a few drops of a ten per cent. solution of bromide of potassium. After development, the prints should be immersed in a weak bath of hydrochloric acid, say, thirty minims of acid to the pint of water, then washed for a few minutes and immersed in the hypo bath. The film is then transferred and washed, as shown by Mr. Bishop. The process is especially suited for transferring drawings to wood blocks, as the film is only  $\frac{1}{16}$  of an inch in thickness. When the ferrous oxalate developer was used, it was well to soak the prints in a solution of oxalate of potash before developing, to prevent the precipitation of oxalate of lime, which took place when hard water was used.

Mr. BISHOP said he had used sulphuric acid to remove the veil so caused.

Mr. HART thought hydrochloric acid was more suitable.

Mr. JACKSON said he always used hydrochloric.

The PRESIDENT described a suitable way of printing through the glass of a negative when a reversed image was required. It was successfully practised by the late Mr. Fox Talbot, and consisted in using, as far as possible, parallel rays to produce the picture; the negative, film outwards with a plate behind it, was placed at the end of a long box with a moderately-sized hole cut at the other end. A concentrated light was employed, and the resulting positives were sharp enough for all practical purposes. Mounted lantern slides could easily be copied in this way.

Mr. JACKSON said that where the lateral inversion could not be remedied by other means the film could be placed on a temporary support, as in carbon printing. Vegetable parchment was very suitable for this purpose.

The next meeting will be on Tuesday, April 17th, when E. CLIFTON will read a short paper on "Early Photographic Processes on Glass."

#### CAMERA CLUB.

On Thursday, April the 5th, a lecture upon stereoscopic photography was delivered by A. STROH. Mr. DONKIN occupied the chair.

Previous to the lecture Mr. Rodgers handed round two photographs by Mr. Henderson, in which theatrical scenes were represented, the exposure given to the negative having been half a second and one second respectively, the light being a combination of electric, lime, and gas light.

Mr. STROH's lecture was one of the most interesting heard during the session. Very complete illustrations of apparatus were shown, and the ingenuity of Mr. Stroh's devices in stereoscopes and stereoscopic cameras was such that Mr. England confessed that with all his experience, he was quite astonished.

A long and interesting discussion upon the paper ensued, taken part in by Surgeon-General Ranking, W. England, E. R. Shipton, Hussey, Lionel Clark, A. Pringle, Major Nott, and the Chairman.

On Thursday, April the 19th, a discussion upon the regulations for photographic exhibitions will be opened by the Rev. F. C. Lambert. Other societies in town and country have been invited to send representatives to this meeting, which will commence at 8 p.m.

#### LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting was held on April 5th, at the Royal Institution, B. J. SAYCE in the chair.

The following were elected members of the Association:—Henry M. Bennett, Richard H. Brown, A. J. Cleaver, E. A. Councell, D. Cunningham, R. Holden Davidson, John Graham, jun., F. K. Glazebrook, James Garnock Jones, Edward Lewis, Walter L. Nickels, John Noakes, Helenus R. Robertson, R. H. Rutherford, and John Vicars.

The HON. SECRETARY read communications from Carl Srna, Vienna, inviting contributions to the Vienna Exhibition; from J. J. Briginshaw, enclosing circulars of the Photographic Convention; and from the Hon. Treasurer of the Boston Camera Club, announcing that they had decided to prepare a series of slides and descriptive lecture on Boston on the plan described in his former letter, and to offer it when ready to the Liverpool and other English Associations, inviting exchanges.

G. H. RUTTER, as Chairman of the Executive Committee of the Liverpool Exhibition, read a preliminary report on the Exhibition, promising a complete one at a later date. From the figures submitted it appeared that the success of the Exhibition exceeded the most sanguine anticipations of the Executive Committee, it having been visited by about 25,460 persons.

A vote of thanks to the Executive Committee, and especially to T. S. MAYNE, its Hon. Secretary, was carried unanimously.

Mr. MAYNE, in responding, mentioned that there were about 100 frames more than at the Crystal Palace Exhibition in London; that 1,600 visitors were present at the opening night, there being about 700 season tickets sold; also that the Mayor of Liverpool gave free admission to about 1,200 children from the Blue Coat School, the Seaman's Orphanage, the Deaf and Dumb Schools, and the Myrtle Street Orphanage, who were entertained with tea, &c., at his expense.

A motion to present a testimonial to Mr. Mayne for his services and arduous labour in connexion with the Exhibition evidently embodied the feelings of all present, and was enthusiastically carried.

#### EDINBURGH PHOTOGRAPHIC SOCIETY.

The sixth ordinary meeting of the current Session was held in 20, George Street, on 4th April, President W. FORBES in the chair.

JOHN M'KEAN read a paper on "Retouching, its Use and Abuse" (which paper we shall publish next week), and afterwards exhibited a considerable number of illustrations by means of the lime light. The paper and the subjects thrown upon the screen—many of which were of a humorous character—elicited a good deal of discussion, in which many of the members took part. In the main, there was unanimity of opinion regarding the proper use of retouching, which ought only to be employed in aiding the photograph to truly represent nature. Over-



touching was condemned on all hands, even though it might please the original to have it, and the prevalence of the abuse was strongly deprecated.

W. BRENNER thought the speaker had, perhaps, carried his objections to the practice too far, and had given the impression that he was more antagonistic and amusing than serious.

J. M. TURNBULL said he had enjoyed Mr. McKean's remarks and transparencies very much. The great art in retouching lay in knowing where to touch and when to stop. Some carried modelling to such an extent that their sitters were made to assume what might be called "dumpling" expressions. The modeller was to blame, but so were the sitters, who were pleased with such pictures. Judicious modelling was wanted, and would ultimately prevail.

F. MOFFAT said overtouching was about equal to no touching. Both misrepresented the sitter—the one in destroying the value of the half tones, the other in exaggerating their depth. Good work required a skilful and intelligent touch.

W. T. BASIFORD said retouching in these days is an absolute necessity, if we aim at a fair representation of nature as we see it. The pencil is necessary to supplement the defects of the photograph, and only to that extent is it legitimate. We must not condemn modelling where it is necessary, nor praise an untouched picture unduly, for the former may give a more accurate reflection of nature than the latter. So long as photography does not register all colours correctly, it must fall short of truth to nature.

#### BOLTON PHOTOGRAPHIC SOCIETY.

MONTHLY meeting held at the Baths, Bridgeman Street, on Thursday, April 5th. E. N. ASHWORTH in the chair.

WILLIAM BANKS gave a paper on lenses in which he exhaustively went into and explained the science of optics as relating to photography. The paper was very instructive and interesting, and a number of questions were replied to.

THE HON. SECRETARY then showed James's flash light, and members having brought down their cameras a number of exposures were made, some of which turned out satisfactorily. The greatest objection to the flash light seems to be that if the sitter happens to be in the act of winking, and the eyes are closed or partly closed, they are so taken, the exposure being so brief that the eyes are taken in just the position they are when the flash is ignited.

#### SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

ON March 28, a lantern exhibition was given, comprising 120 out of the 200 slides sent by the Camera Club of London, and several slides illustrative of the recent March blizzard in New York.

Before the lights were turned down President WALKER remarked that this was probably the last opportunity he would have to address the members and friends for some time at least, since his term of office expired on April 10, after which he intended to take a trip across the Atlantic in the large steamer *City of Rome*. He thanked the members for their support in attending those interesting exhibitions which were so instructive in furnishing the means for showing one's pictures to friends. He wished them all prosperity, and was sure the Society would grow in interest and numbers. Though not a man of scientific attainments in photography, he had done his best, as President, to further its interests, and had had a large share of the work himself, even to the duties of a janitor. He thought there should be more division of the work.

As the exhibition proceeded he read the titles of the pictures. The first view was in Hollywood Park, and was a delightful study of trees. Others much liked were entitled "Virginia Water," "Village School," "Horses standing in water," "Curt Gate Glen," "Matlock in Derbyshire." Several studies of trees, those particularly of Newark and Burham Beeches, were very clear. "A view in Shere, Surrey," "The Camera Club on an excursion," Rochester Cathedral entrance and door, "Boats at Rochester," three or four views of an old mill in Westerham, with beautiful trees and water effects, all proved to be very attractive. A view by F. J. Barclay entitled "Old Mansion" in Kent was particularly good, also another called "Enysford Bridge." Several slides by A. R. Dresser next followed, and were much liked, particularly his views around Sutton, "Old Granny," a very clear photograph of an extremely old woman; also his animal pictures of a peacock, sheep, and pigs. The pig picture

was specially good. One of his most artistic views was of a team of horses plunging in a field, drawing a heavy English plough. A number of excellent slides by George Mason next appeared, some of which were "Diana's Fountain," "Swan Inn," "A stone bridge," "Cottage at Leeds," "Bull Point Lighthouse," "Inn at Hampton," and a "Cottage at Cockham" on the Thames. A ploughing scene by Wm. M. Robertson was much admired. "Hop picking," and portraits of an "Old Englishman and his wife" in front of their cottage door (an excellent study well lighted) by Rear-Admiral H. L. A. L. Maitland, were extremely interesting. A view of "London Bridge," "Cockham Loch," "Spring Cottage," and a "Landing Place on the Thames," by Francis Howlett, attracted attention by their clearness and artistic qualities. A very pretty slide was that of a boat having aboard two ladies, by J. R. Bridson; the reflection in the water was especially good. Beautiful snow effects, particularly a snow tree at Torroy, and a cottage in the Isle of Wight, by F. G. J. Linton, were next shown. A coast scene by S. Conway was good, also a very artistic and charming view by G. Davison, the genial secretary of the Camera Club, entitled "Cottage at Shere." The exhibition of the English slides terminated with three superb slides by Joseph Gale, two of which were entitled "Sheep," a splendid study, and a "Foggy day on the Thames," having a bright foreground of snow against an inky sky.

Several views around New York, by Chas. Simpson, showing some of the tremendous snow piles caused by the March blizzard, were next projected on the screen. They embraced scenes in 16th Street, 14th Street, along Sixth Avenue, melting the snow in Howard Street by fires, the coal merchants in Baxter Street peddling out coal to the poor people at fabulous prices, and "Five Points" before and after the storm. The pictures were fully up to Mr. Simpson's reputation for careful work. These were supplemented by excellent views by Dr. Nagle, of the Health Department, and two or three by Richard H. Lawrence; the latter had a fine view of Broad Street, taken from near the United States Sub-Treasury building, and also of the Statue of Washington on the steps of the Sub-Treasury, as it appeared after the storm. This presented a most conical sight, and brought down the house. One or two slides contributed by Mr. Baldwin were very much liked, as was also a rocky coast scene by Rev. E. C. Bolles. The exhibition ended by a few slides contributed by Mr. Atkinson, the best of which was an extremely clear and artistic picture of some fern leaves.

### Talk in the Studio.

PARIS UNIVERSAL EXHIBITION OF 1889.—A deputation from the Executive Council of the British Section recently paid a visit to Paris for the purpose of inspecting the various spaces allotted to Great Britain, and have now reported to the Lord Mayor, the President of the British Section, that they consider the arrangements, as far as they have at present progressed, to be satisfactory. The Exhibition will extend over two large spaces of ground—the Champ de Mars and the Esplanade des Invalides. It will therefore be very much larger than that of 1878, which did not take in the Esplanade des Invalides. Besides these, it will include, as in 1878, a considerable space on the northern side of the river Seine, viz., the Trocadero Palace and grounds. The two main divisions of the Exhibition on the south side will be connected by a long range of galleries running along the river bank on the Quai d'Orsay. This fine roadway is now being diverted from its usual employment and is being covered with the necessary buildings. The eastern end of these galleries—that is to say, the end nearest Paris, and close to the Pont de la Concorde—will be allotted to British Agricultural exhibits. The work of constructing the galleries was commenced at the western end, and consequently the British part has not yet been reached. Of the main buildings in the Champ de Mars, the largest and finest will certainly be the machinery gallery, which will occupy the southern portion of the ground. It is a large hall of a single span, and a good idea of its size may be given by saying that it will be somewhat larger than St. Pancras Railway Station. The side walls of this are partly finished, but no part of the roof is yet on; some of the girders of the roof are now being raised into position. Great Britain will occupy a position in the north-eastern corner of the building. The following are, in abstract, the regulations as to space. Applications must be sent in not later than the 28th April, 1888, to the Secretary of the British



Section, No. 2, Walbrook, E.C. A sketch of the shape of the space required will greatly assist in the arrangement of the exhibition. The charge for space will be 5s. per square foot, with a minimum charge of £5. Whatever vacant space exhibitors require around their exhibits, beyond the usual passages, will have to be paid for. Exhibitors requiring wall space must mention the fact on making application, when they will be informed whether any such space can be granted, and if so, on what conditions. Payment to the extent of 50 per cent. of the amount payable must accompany the application, and the balance must be forwarded on receipt of the notice of allotment. In no case, however, must the deposit be less than the minimum charge of £5. No exhibit will be allowed to be placed unless full payment has been made. Space not occupied seven days previously to the opening of the Exhibition will be otherwise allotted, and all payments made in respect thereof absolutely forfeited. An additional charge will be made of 1s. per square foot for counters. As the space at the disposal of the Executive Council is limited, intending exhibitors are requested not to apply for more than they actually require. Special application for spaces in the grounds will be considered. Application for motive power, &c., must be made on special forms, which will be supplied on application to the Secretary. Photographs and photographic apparatus are classified under Group 2, "Apparatus and Processes of the the Liberal Arts." The Executive Council of the British Section include the Lord Mayor of London, the Right Hon. A. J. Mundella, Sir Lowthian Bell, Sir John Lubbock, Bart., Sir Frederick Leighton, Sir Douglas Galton, Sir Henry E. Roscoe, Sir John Gilbert, Sir Howard Grubb, William Crookes, Professor W. Roberts-Austen, W. H. Preece, William Woodall, and H. Trueman Wood.

**AMATEUR PHOTOGRAPHY IN IRELAND.**—The second of the series of articles in the *Weekly Freeman* is to be found in the issue of April 7th, and is devoted to directions for preparing the various stock solutions.

**THE NEWCASTLE ASSOCIATION.**—At a meeting on the 10th instant H. R. Procter read a paper on "Instantaneous Shutters," and exhibited several shutters, and in addition numerous shutters were brought by members; over twenty different kinds were on view. Outdoor meetings were arranged for May 9, Barnard Castle; June 13, Mouth of the Tyne; July 11, Bellingham and district; August 8, Chollerford; September (date not fixed), Ripon and Studley.

**PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.**—The usual ordinary meeting of this Society will take place on Tuesday next, April 17th, at 8 p.m., at the Gallery, 5A, Pall Mall East, when a paper on "Emulsions," by W. K. Burton (Imperial University, Tokio, Japan), will be read; and a paper "A Lens Tube complete with Iris Diaphragm, and adjustable exposur, and a combination set of Lenses for use in such a Tube," will be read by G. L. Addenbrooke.

**BURGLARS UNREWARDED.**—An entry was made on Sunday last at the premises of the United Kingdom Dry Plate Co., 49, Bedford Street, Strand, but as all monies had been banked, the burglars had to content themselves with 4s. worth of stamps; but they investigated the inside of some of the heavy packages lying about, and spoiled a few plates.

**ACTION OF LIGHT UPON THE ELECTRIC DISCHARGE.**—The action of light upon electricity is again attracting attention. Lately the singular effect of light upon electric conductivity, especially with regard to selenium, has been studied. To-day another very curious fact has been made known relating to the electric discharge between two conductors. It is at the Philosophie and Literary Society of Manchester, that Professor Schuster recently called attention to an experiment of Dr. Hertz, at Carlsruhe. According to this scientist, when the ultra-violet rays are thrown upon metallic spheres, between which pass electric sparks, it is found, that under these circumstances the sparks pass more freely, and they may be obtained of a much greater length. It would seem from this that the ultra-violet rays of the solar spectrum have the property of facilitating the electric discharge between two metallic conductors—that is to say, to render the air between these two conductors better adapted to conduct electricity. Nevertheless, we must not hasten to admit this fact before it has been confirmed by other experiments. It may be recollected that a long time ago Morricini, an Italian scientist, and Mrs. Sumner, a learned English lady, author of a treatise on Physical Geography, had announced that these same violet rays had the property of

magnetizing sewing needles. Later on it was found that the needles were already magnetized before the experiment, and that exposure to the light did not magnetize them.—*Philadelphia Photographer*.

**COLOUR-BLINDNESS A BRAIN AFFECTION.**—Professor Ramsay believes that the particular defect giving rise to colour-blindness lies, not in the eye itself, but in the brain. Certain persons, he points out, are incapable of judging which of two musical tones is the higher, even when they are more than an octave apart. Yet, as such persons hear either tone perfectly, the defect is not one of deafness. He accordingly argues that in such persons the brain is at fault, and thence proceeds to the assumption that it may be equally true that the inability to perceive certain colours is not due to a defect in the instrument of sight, the eye, but to the power of interpreting the impressions conveyed to the brain by the optic nerve. If this is the case, the problem is no longer a physical one. It falls among those with which the mental physiologist has to deal.—*The Medical Press*.

**PHOTOGRAPHIC CLUB.**—The subject for discussion at the meeting on April 18 will be the Management of Exhibitions, with reference to a communication from the Camera Club.

## To Correspondents.

\* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, *THE PHOTOGRAPHIC NEWS*, 5, FURNIVAL STREET, LONDON, E.C.," while Advertisements and Business letters should be forwarded to "PIPER AND CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

**C. WYRALL.**—We think that it is because the paper is of a quality quite unsuited for albumenizing, and that the markings are due to special hardness and impermeability of the parts concerned.

**POULTON & SONS.**—We have not yet received the copy of the *Stationary Trades Journal* to which you refer in your note.

**J. C. ASTEN.**—The idea seems ingenious, but we have not seen the article in question.

**J. R. GORZ.**—Your letter of April 4th came duly to hand, but the surfaced glass plates were received too late for notice last week, and the photographs referred to have not yet been received. We shall be glad of further particulars as to the Patent affairs.

**Q. H.—1.** Use thick water colours and a fine sable brush. **2.** We think the whole thing a mistake.

**S. A. WARBERTON.**—We have no exchange column.

**NEMO.**—Perhaps the base was gum. Husnik's System with albumen answers admirably.

**T. B. T.**—The collodion is of too rotten a nature; perhaps from long keeping.

**A. C.**—Take care that the part of the window blocked out with black calico admits no gleam of white light, and use on more thickness of golden fabric on the rest. If the sun shines on the window, further protection will be needed.

**A. LAYARD.**—This sort of thing is never the subject of arrangement or payment in the case of the editorially controlled portion of a decently conducted periodical.

**FRED JAMES.**—The best thing we can do is to send you some French publications as soon as we receive the next issues, and then you can judge for yourself.

**EDGAR LEE.**—The report having arrived late, is perforce condensed and placed out of the usual position.

## The Photographic News.

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# THE PHOTOGRAPHIC NEWS.

VOL. XXXII. No. 1546.—April 20, 1888.

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## THE PHOTOGRAPHIC EXHIBITION AT GLOUCESTER.

THIS exhibition, which was opened on Monday evening last by T. Gambier Parry, is a wonderful illustration of what may be accomplished by indomitable pluck and energy, and reflects the greatest credit on president, committee, and secretary alike. When we put in an appearance on Saturday morning, being anxious to be forward with our report, hopeless chaos met the view. There was a bare, gaunt room—admirable in proportions, it is true, and well lit, but what a wilderness! Fragments of ill-painted set scenes blocked one end of the room, and a proscenium was in a state of collapse upon the floor. There were, it is true, a few photographic portraits hung in one corner of the room, and a few yards of warm-coloured drapery had been suspended behind them, but this warm corner only intensified the gauntness and greyness of the rest of the gallery.

"When do you expect to open?" was only a natural question from one accustomed to the sedate deliberation exercised in the hanging of the pictures at the Pall Mall Exhibition. "We *must* open on Monday," and, in answer to a grin of incredulity, a further remark was added, "but we *shall* do it; we did not get possession of the gallery till six o'clock this morning, and, if necessary, we will go on night and day till it is done." A visit on Monday showed immense progress, and grave doubts arose in our mind as to when the last day of the week ended and the first of the new week began in this calendar of the committee; but still the completion seemed all but impossible, for new cases of pictures were still arriving. The afternoon results gave a victory to the workers. The catalogue grew with the pictures, and the printer's devil was in constant attendance upon the secretary, F. H. Burr, and by five o'clock a rough proof was in the hands of the judges, and the exhibition practically complete. The effect was most satisfactory, for warm drapery covered the walls from a point far above the eye down to the ground, and the cool grey of the wall above harmonised perfectly. The room is larger than the gallery in Pall Mall, and is admirably adapted for a photographic exhibition, and many of the pictures gain by the more perfect lighting of the corners of the gallery. There are no screens, and the effect on entering the room from the end instead of the side, as at Pall Mall, is most striking, and a distinct gain over the London gallery. The dull red drapery is permitted to show between the pictures, greatly to their gain, besides giving greater warmth to the whole gallery. There are, of course, a great number of pictures that have been shown in Pall Mall and elsewhere, and the proportion of platinum and bromide prints is much larger than in the last London show. The colour of the bromide prints has also much improved.

On the whole, it is an admirable exhibition, and, with the nightly attraction of a lantern exhibition, should be a financial success. It is to be hoped that it will be kept open longer than at present announced, for a week is certainly not long enough, and its educational value to the amateurs of the West of England is without doubt. The genial president, Geo. Embry, is sanguine of success, and the active workers deserve it as the crown to their labours.

The committee have been most liberal with medals, and in addition several have been offered by bromide plate and paper makers for results on their specialities. The following gentlemen have been invited to act as judges:—Valentine Blanchard (London), Abel Lewis (Clifton), and Edward Brightman (Redland); and the following are the awards made by them:—

Class 1.—Portraiture.—Silver Medal for large panel portrait of a child, to W. J. Byrne; Bronze Medal for large platinum group of lady and child called "My Mammy," by W. W. Winter; Extra Bronze for large panel portrait of Marchioness of Londonderry, by J. Lafayette; Extra Bronze for large portrait study in costume called "A Recollection of the Hague," by G. T. Whaite.

Class 2.—Landscape or Seascape (Professional).—Silver Medal for yacht studies from a sailing boat, by G. West and Son; Bronze Medal for series of landscapes, by J. P. Gibson; Certificate of Merit for "In the Hayfield," by John Pike.

Class 3.—Landscape or Seascape (Amateur).—Silver Medal for series of landscapes in platinum, by Harry Tolley; Bronze Medal for Norwegian views, by Domenico Barnett; Extra Bronze for "Twitch Burning," by Geo. Davison.

Class 4.—(Amateur Photographers): Medal for series of six Quarter-Plate Landscape or Seascape.—Silver Medal for series to J. W. Wade.

Class 5.—Best Landscape Negative on Fry's Plates.—Silver Medal for "Thirsty Moments," by Rev. H. B. Hare.

Class 6.—Six Contact Prints on Fry's Argentic Paper.—Silver Medal for series by Martin J. Harding.

Class 7.—Architecture (Professional).—Silver Medal for series of interiors, by R. Keene; Bronze Medal for series by J. H. Hogg; Certificate for "Interior of Picture Gallery, Jesmond Towers," by W. Parry.

Class 8.—Architecture (Amateur).—Silver Medal for series of interiors, by H. Manfield; Bronze Medal for "Banquet Hall, Headon," by Thos. Morton, M.D.; Certificate for one picture in series by Geo. Fowler Jones.

Class 9.—Genre or Figure Picture.—Silver Medal for "Reading to Granny," by W. Gillard; Bronze Medal for "In Disgrace," by Ralph W. Robinson; Certificate for "It began with a chat over the railings, and ended as usual," by H. W. Williams; an Extra Silver Medal for "Carolling," by H. P. Robinson as the most notable



picture in the exhibition; also an Extra Silver Medal for "Water Rats," by F. Sutcliffe, for its artistic excellence.

Class 10.—Enlargements, not Portraits (Silver Medal not given).—Bronze Medal for "The Choristers," by F. Whaley; Certificate for "Normandy Women," by T. G. Whaite.

Class 11.—Enlargements on Morgan and Kidd's Paper.—Silver Medal for "Liberty Boats going out to the Fleet at Spithead," by Captain Harrison; Bronze Medal for "Portrait of a Girl," by E. Ray and Son.

Class 11A.—Enlargements (Amateur).—Silver Medal for "Yachting Studies," by W. C. Beetham; Bronze Medal for "St. Agnes' Church," by Charles W. Huson, B.Sc.; Certificate for "Old Inn Yard," by Domenico Barnett.

Class 12.—Lantern Slides (Professional).—Silver Medal for series by G. W. Wilson and Co.; Bronze Medal for Swiss views, by M. Auty; Certificate for series by York and Son.

Class 13.—Lantern Slides (Amateur).—Silver Medal for series of twelve, by W. Norgrove; Bronze Medal for series of twenty, by A. R. Dresser; Certificate for series of twelve, by W. M. Martin.

Class 14.—Photo-Micrographs.—Silver Medal for series by F. H. Evans; Bronze Medal for series of Starches, by W. Griffiths; Certificate for "Micro-Organisms," by Andrew Pringle.

In Class 15 (Apparatus), the judges had not time or opportunity to test, and therefore left the awards in the hands of the Committee.

Class 16.—Special (Extra Class).—Bronze Medal for "Studies of Animals," by D. Hedges and Sons.

A review of the other pictures will follow next week.

#### ACKLAND'S PHOTOGRAPHIC EXPOSURE SCALE.

A COMMENDABLE tendency has exhibited itself in photography of late years, to substitute that amount of certainty or probability which is the result of calculations for the guess work which must otherwise prevail.

The actinometer, sensitometer, and the fixing of a definite standard for lenses and diaphragms, afford examples of the tendency referred to, and each of these contrivances has proved of great utility as affording bases for setting to work with as little uncertainty as may be. When, in the case of a gelatine plate of a different sensitiveness from others that have been used, and taking a photograph of some scene in a light the strength of which the operator scarcely feels sure that he can estimate properly, there are several results of calculation which the instruments mentioned will give, but these must be correlated before the time of required exposure can be known. For the purpose of making this correlation without the labour of further calculation, Ackland's Photographic Exposure has been produced. It is an ingenious arrangement of discs marked with numbers. One disc refers to the sensitometer number of the plate, another to the scale shown by an actinometer, a third to the number on the uniform standard scale of the stop or aperture made, and the fourth to the nature of the subject to be photographed. By setting each of the discs to the indications that are known, the exposure will be found in figures representing seconds opposite to an index on the top disc. As one of the means for attaining that excellence which comes from exactitude, we can recommend Ackland's scale, more especially to amateurs.

#### THE MAGNESIUM FLASH-LIGHT.

W. H. H. CLARK gives, in a recent issue of the *St. Louis and Canadian Photographer*, his experiences with the flash-light, and we reprint the following:—

I present herewith a rough diagram, which is not engraved exactly as I intended. Figure 1 is the light complete. A jointed rod, on tripod legs, made to raise and lower; the upright can be made in three parts where it is desirable to have the light at a

greater elevation; *a* is a bent tube, either of glass or metal, passing through a cork in an upright piece fastened to the base, upon which the small alcohol lamp *b* rests; *c*, the magnesium powder, on a tin shelf, just in front of the lamp, and directly opposite the flame, which the tube *a* enters. The dotted line above represents a reflector. A sheet of tin or cardboard bent at right angles and set in the edge as represented by figure 4,

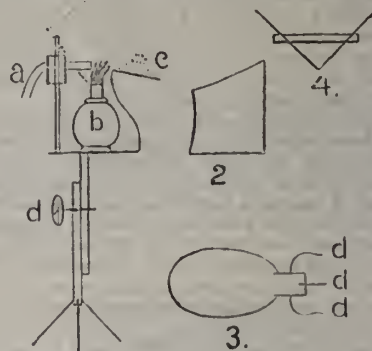


Fig. 1

cut as in figure 2, then place another piece of tin or cardboard on top to throw the light down. Figure 3, a rubber bulb with as many prongs for attaching rubber tubing to connect with the pipes *a* for as many lights as it is desired to flash at once. The one I have has attachments for producing four flashes; if not desired, can be left open or plugged up with a bit of cork. The light can be raised and lowered to suit, and placed in any position and in any part of the room desired. Now in charging, it matters not what powder you use, whether the so-called self-igniting, or the plain magnesium. It is decidedly the best to use a small bit of gun-cotton as a fuse; very small quantity for powder mixtures is sufficient. Place it just where the flame will catch it when the bulb is slightly pressed, then place your powder in front and on the cotton. Plain magnesium powder requires considerable cotton, and the powder sprinkled all over it; but always leave the cotton so the flame as it shoots out by the pressure on the bulb will be sure to catch it, and you have, with a certainty, as many flashes as you have designed, and all in the same time.

In another part of the same issue we find an account of some experiments of Mr. Clark, which may serve as a caution:—

"Mr. W. H. H. Clark, while experimenting with the magnesium powders for the purpose of demonstrating the best, simplest, and most practical mode of igniting simultaneously several flashes, demonstrated the fact that it is most dangerous to attempt blowing the powder from a bottle into the flame of a lamp. He was unable to secure a suitable flash with one lamp, therefore two were used, and they produced an unsatisfactory flash. When a lamp giving a larger flame was substituted, and when the pneumatic bulb was pressed, a considerable flash was produced, but not a desirable one; but upon releasing the pressure on the bulb, the flame was drawn back into the bottle, and a terrific explosion followed, but fortunately, not the slightest damage being done to person or property, other than the bursting of bottles, lamps, glass pipes, &c. It seems almost a miracle that such an explosion could occur not over eighteen inches from his face, and not a particle of the fire or broken glass touching him, while fluently broken glass was scattered in all directions even to the farthest corners of the room. Mrs. Clark, a few moments before, had left her seat where the largest pieces of glass were found. We therefore warn our readers against trying the experiment of blowing the powder from a bottle into the flame, else you may not escape so fortunately."

#### RETOUCHING, ITS USE AND ABUSE.

BY JOHN M'KEAN.\*

PHOTOGRAPHERS are well aware that in the present advanced state of their art the professional has few advantages over the amateur in picture making. The use of retouching, however, seems but

\* A Communication to the Edinburgh Photographic Society.



little understood by the majority of amateurs, and is, I venture to say, but vaguely understood by a large number of so-called professionals, who, when they have acquired the knack of piling on the lead, put themselves forward as first-class retouchers. Having experienced much trouble and disappointment in finding a thoroughly intelligent artist in this direction, I am of opinion that something of a practical illustration of what to do and what to avoid might be advantageously discussed in photographic societies. With a view to this I purpose by means of the oxy-hydrogen lantern to exhibit a few of the real and possible eccentricities of the modern photo-art retoucher. And if in so doing I shall "tread on the tail of his coat," and start a frigidly discussion, the object of my paper will be fulfilled.

In the use of the pencil, as in the art of lighting and posing, the artistic knowledge of the photographer will manifest itself, and on this much of his success in business is likely to depend. Though much has been written in favour of retouching, no process in the art of making a picture has been more abused. It is only within the last few years that retouched photographs were allowed to compete in any exhibition. The art is now universally recognised as an aid to artistic effect. It has assisted to lift the photographer on to a higher platform than he was at first thought worthy to occupy, and the portrait painter is not far ahead of him in the way of idealizing his subject. The camera, however, cannot create ideal figures, and so he must model to best advantage whatever of defective human nature comes before him.

Physiognomists say the human face is the index of the soul, and as there are never two faces found to be exactly alike, we may presume that the spirits within also must differ; but when the spirit finds fault with its own work on the features, we may suppose the photographer will have little credit in transferring them to paper, unless he exercises his retouching art, so far at least as to smooth the ravages of time and trouble, or lighten the scowl of discontent, and call up, if possible, that expression of high-souled joy which belongs only to the countenances of the really good and noble—a task sometimes of no small magnitude.

Photography has done much to make mankind happy. Undoubtedly it is a "gift" by which we ought to see ourselves as others see us, though that is not always so happy as the photographer might expect. There seems to be something desirable beyond a mere likeness. But why look to the painter or photographer to depict what is really not visible? We have nothing to do with what men or women would like to be, and to push our art further than the simple reproduction of what is put before the camera is more than should be expected of us. Yet much more is expected, and is daily bestowed on the majority of portraits sent out from the modern studio. Let us briefly inquire into the cause of this, and, if possible, find some justification for the work of the retoucher.

The word retouch is generally applied to the process of filling in, or making good, the defects of photography in a negative. This is of course presuming that a photograph is not in every respect a true representation of the object treated, though that is not, strictly speaking, the case. If, for example, a negative of some unfamiliar landscape is taken, the photographer has every confidence that, if the exposure is correctly timed, he has in matters of detail obtained a true likeness of the scene as it then appeared, as regards light and shadow. Yet some objects, which to the eye appeared bright and inviting in nature, may be toned down into insignificance in the resulting photograph. This of course depends on the active power of the various colours present in the landscape, and which differ to a greater degree than the natural eye is capable of discerning. A skilful photographer always takes such conditions into consideration before exposing his plates. The want of this knowledge is the source of many failures with beginners. A landscape may appear charming to the eye, yet to analyse it from a photographic point of view it may be of little pictorial interest. So with the human face.

If the public generally were better informed as to what constituted favourable conditions for portraiture, there would be less cause for anxiety on the part of the photographer, and more satisfaction on both sides. It is no uncommon occurrence for a patron of our art to come into the studio and say, "I want to be taken like Miss or Mr. So-and-So," and it requires no small amount of tact or explanation to convince your customer that such a view of the face may not be favourable as a picture. Yet if the demand is insisted on, which is too often the case, rather than give cause for offence, the long-suffering photographer takes a negative as requested. In due time a proof is submitted, and comparison is made with the work of another artist on an entirely

different face, resulting in disappointment and even disgust. And ten to one, if cash has not been paid at time of sitting, no more is seen or heard of this worthy critic, by whom, too often, the photographer is set down as one quite incapable of rendering by his art that noble smile of benevolence which perhaps existed only in the ideal of his sitter.

The question has often been asked me, "Why is there so much difference between the work of the so-called first and third-rate photographers?" My answer invariably is (setting aside all those weeds who have no desire or energy to rise in the profession, and who use their cameras only as a means to extort money, thus casting discredit on a useful profession):—In the majority of cases, the third-rate photographer is usually one who has begun business on a small capital, and must for a time content himself with third-rate prices, and consequently third-rate sitters, which include some of the poorest undeveloped features of the community, uninviting as the barren crofts of the Highlands, yet, with such material, no matter how able he is as an artist, the photographer must struggle on, till he has made a name for himself by flattering with his pencil the hard features of our otherwise noble sons and daughters of toil. I unhesitatingly say, that the pencil has lifted many a photographer into fame, till he could afford to raise his prices. No sooner has he done so, than he blossoms into a second or first-rate photo-artist. He can now spend more time in lighting and posing his sitters, and finally work up the faces of his clients according to his or her ideal fancy. But this fortunate son of the camera may find, on looking back from the eminence to which he has climbed, that he has left him many of those rugged features that were his first steps on the ladder of fame. His prices have shuffled off a "mortal coil" of the poor in purse and intelligence, with whom the study of countenance and personal adornment were as an unwritten book. When a photographer has reached thus far in his profession, if he has been successful in making pictures of the raw material with which he began, surely he must produce more charming portraits when his patrons bear the stamp of intellectual and moral refinement.

This may not be a sufficient answer to all, and the question may be asked, "What has all this to do with retouching?" I have simply to say, that the pencil is at the root of it all. The higher the intellectual and moral culture, the less use there will be for the pencil, and that is the ideal which artist and subjects strive for, or should aim at.

Whilst acknowledging the art of retouching to be a valuable adjunct to photography, I am of opinion that it has diverted to a considerable extent the mind of the young photographic artist from the more important study of lighting and posing, and, I might say, from the science of developing his negatives to greater perfection, to say nothing of the enormous waste of time among photographers who have not courage to send out proofs to their customers before the negatives have been retouched. I do not know to what extent this is now practised, but I have seen cartloads of negatives that have been carefully retouched, and proofs printed from them, actually thrown away as refuse. You can imagine how much more profitable it would have been had such wasted energy been devoted to the more essential study of artistic effect in photography pure and simple. Retouching, with some would-be aspirants to artistic fame, is looked upon as the highest possible attainment in the photographic arena. And to soil their fingers in the dark room would with some, I know, be too disagreeable to think of.

Mr. James Ross, an old and respected member of this Society, and one of the most successful photographers of his day, once said, "Photography is nothing if not truthful." This gentleman, like many others of his time, had a great aversion to the then new art of retouching, which, like the advent of the gelatine emulsion, was destined to work a revolution in photography. But he also, before retiring from business about ten years ago, had become a convert to the art of flattering. Well I remember the struggle he had to uphold the photographic real, against the public and retoucher's ideal. But the march of progress was rapid, and he, like many other pioneers of the wet collodion days, stood aside, and so freed himself of that sin which is not unlikely to lower many photographers in the estimation of future generations, viz., the obliteration of every phase of character as traced by the pencil of nature on the face of their sitters. I refer, of course, to the prevailing sin of retouching to death those lines which are the work of the heart, soul, or spirit, though we are often too ignorant or careless to decipher them.

"Next to a knowledge of ourselves is that of our fellow-men," says the physiognomist. "We are social beings; we are brought



into daily and hourly contact with other social beings. Much of our happiness and success in life depends on the character of the intercourse we hold with them. To make it pleasant and profitable, we must be able to some extent to read men as an open book." If this be true, what a great responsibility rests with the photographic retoucher. Think into what uses photography is now pressed. From the choice of a wife or husband, the hire of servants, &c., to the detection of crime and criminals. The searching eye and work of the camera is extensively used as a medium through which the character of the original is scrutinised. No doubt photographers are well aware of this, and out of sympathy for the wife-seeking bachelor or the marriageable maiden of uncertain age, he plies his art of flattering. In cases such as this it is seldom objected to; but, in all seriousness, is it honest? We little know into what trouble we may lead our victims. Innumerable cases of disappointment and chagrin have followed favourable impressions made by an idealised portrait. It is true the eye of the camera gets the credit of seeing more than our natural eye is capable of discerning. We are therefore sometimes disappointed, after forming in our mind an ideal picture, to be brought face to face with only a plain matter-of-fact likeness of our subject. Yet, after all, if we think rightly, we should expect no more. In this particular we ought to cherish photography for its truthfulness. But who, of all the patrons of the studio, are like Cromwell, in the matter of a likeness, willing to show posterity every trace of nature's handiwork or freaks, even to a wart on the face? Where are they who are not susceptible of a little flattery? Well, not to put too fine a point on it, I am afraid retouchers have been catering too long for the pride and vanity of human nature, and the public have been taught to believe that these smooth, touched-up, alabaster-like photos, found nearly in every album, are really "awfully like them." In many cases indeed they are awfully fine pictures. And the happy possessor of such a flattering likeness straightway recommends the photographer, who has made such a favourable impression, to all his or her friends. Now this is exactly what is done every day, and he who sends out his work without the aid of a retoucher will find it hard to compete with those who go in for high artistic modelling, as some are pleased to call it. Such has been the influence of the pencil. "The pen is mightier than the sword," it is said, but in the photographic art, the pencil is mightier than the camera, in the way of flattering at least.

"He who pencils his negatives, buries truth in a leaden coffin," said a photo-philosopher, named Thomson, and with him I almost entirely agree. But how are we to get out of it? Will the public ever come to appreciate an untouched likeness? I do think there is some tendency in this direction, because it is possible at times to come across an untouched photograph of some popular celebrity. Such pictures are valuable, as they are scarce. Let us have more of them, and less of the so-called idealised portraits, which at best give but temporary pleasure. A portrait that is truly valuable should be untouched except where the light has failed to bring out what the natural eye sees and appreciates; we can then form some judgement as to the character represented, as Pope says:—

"Nature affords, at least, a glimmering light,  
The lines, though touched but faintly, are drawn right."

How precious are the portraits of those who have left their "footprints on the sands of time" before the photographic era. Yet how much more precious would the poorest untouched work of the camera be to him who would know something more than the painter's ideal. Whatever future generations may think of their forefathers, photographers should strive to court a favourable opinion of themselves. Their art may yet take higher flights, but let it be said of them, that they used their cameras in the cause of honest art and truth. A true friend and a never-failing aid to the portrait-painter is the art of photography. And a true likeness as a thing of beauty is "a joy for ever."

#### A NEW COMMERCIAL APPLICATION OF OXYGEN.

BY THOS. FLETCHER.\*

TURNING now to the laboratory, as most of you will know, I have identified myself for many years with apparatus for the production of high temperatures for experimental purposes, and the cheap production of oxygen has advanced our powers in this direction very considerably. When any new application of a power is discovered, my own instinctive feeling turns at once to

its application in the chemical laboratory, that source from whence a very large proportion of our commercial knowledge and power has originally sprung.

It is not only necessary that a new power shall be known in the laboratory; the most important point from a practical point of view is that it shall be easily and quickly applied to useful research by those whose time is limited, and the elements of time and personal trouble must be eliminated as much as possible.

My first attempts to utilise compressed oxygen for laboratory gas furnaces proved total failures, owing to the intensely local heat evolved, which entailed cutting and destruction of any and every crucible, an experience which your Secretary also had in some trials he made in the use of oxygen. The direct application of the heat to the contents is, in many cases, out of the question; and, after some experimenting, I found that the desired result could be obtained by mixing air with the oxygen blast, so as to increase the size of the flame, and spread the heat more evenly over the surface of the object to be treated. The form used for this purpose is similar to the well-known injector blow-pipe, the air jet being, for a small laboratory furnace,  $\frac{1}{4}$ -inch bore and open at both ends; behind this is a small oxygen jet, pointing directly along it. When the oxygen blast is turned on it carries along with it about four or five times its bulk of air. Having got so far, I was again blocked by the fact that no known casing suitable for gas furnaces would stand the heat obtained, even for a few minutes. The only kind of casings which can be satisfactorily used for laboratory gas furnaces are composed of a mixture of very refractory clay and ground cork or sawdust. When these are fired in a kiln, the woody matter is burnt out, and a porous material is left which offers a most extraordinary resistance to the passage of high temperature through it. It is, as is very well known, an easy matter to fuse cast iron in a crucible in a casing of this material only one inch thick, before the outside of the casing has time even to become slightly warm to the hand. The objection to this mixture is, that the salts contained in the wood or cork are not burnt out, and they remain, acting as a flux on the refractory clay, reducing its resistance to fusion to a very serious extent. This difficulty has, however, with the assistance of the Morgan Crucible Company, been at last overcome; and, as the increase of power in our guns leads to improvement in armour plates, so has the increase in power of our laboratory furnace burners led to an improvement in the resisting power of the crucible casings which have to stand their destructive power. By the discovery of a very refractory clay, which has practically the same contraction as the porous mixture, it is now possible to line the furnace casings with a thin layer, which offers an extraordinary resistance both to fusion and also to the action of fluxes. That these casings are only in their preliminary stage, and not at their most perfect point, goes practically without saying, and only a few have been made up to the present time. One difficulty not yet perfectly overcome is the tendency of the refractory lining of the lid to tear loose, owing to the thinness and the slight hold available; this is, however, only a question of detail, which will shortly be overcome.

With the injector furnace, which is undoubtedly of great value for chemical research, I have been for some years held in check by the fusibility of the casings, and this has of necessity put a very definite limit to the power of the burners which could be employed. As this limit is now, or very shortly will be, greatly extended, there is an opportunity for further experiments on the air and gas burners for ordinary use, irrespective of the new power we have now at command. Using the combined air and oxygen burner with one of the new casings, you will see that any power, from the lowest to the highest, can be obtained with the greatest ease, and without attention, as one of the small 20 feet oxygen cylinders will work this furnace at full power for about two-half or three hours, and at lower powers for a correspondingly longer period.

I have already expressed an unfavourable opinion as to the use of gasoline or benzoline vapour for use in open blowpipes, but this objection does not exist with furnaces where the mixture is blown on to a surface at a high temperature, which ensures perfect combustion and persistence of the flame. The only working objection to the oxygen blast in gasoline or benzoline vapour furnaces at present is that a supply of air must be blown through the generator to produce the combustible vapour.

Whilst experimenting, it is the nature of chemists to consider the expense after the money has all gone; in fact, if this were

\* Continued from page 234.



not fortunately the case, very little original work would be done, and, to follow this old-established rule, now the oxygen is gone, we will consider the expense. In the first place, owing to the great concentration of the heat, the loss in use is exceedingly small, the nitrogen, which in an ordinary blowpipe flame is a source of great waste, is partly or entirely absent, and, as a consequence, the coal gas consumed is in practice only about one-sixth of that required to do the same work if an air blast is used. The oxygen, if made on a large scale, can be produced by Brin's process at a cost varying from 2s. to 7s. per 1,000 cubic feet, depending on the quantity made.

In the steel bottles the compressed gas is now sold at from 2d. to 3d. per cubic foot, which is, of course, a high price for work on anything like a commercial scale; but if we keep a few small bottles of compressed oxygen ready for emergencies, their value may, in some cases, be more than a thousand times their cost, and the expense becomes, therefore, a minor consideration.

It may be well to mention, whilst dealing with this subject, that compressed liquid nitrous oxide has been used for small blowpipes for platinum working, but it is not only very much more costly than compressed oxygen, but it is also not so satisfactory. With the oxygen, repairs of platinum vessels in the laboratory become a very easy matter, and the ordinary forms of blowpipes can be used for this purpose, provided a small jet is used and the outer cap is kept about three-eighths of an inch in advance of the jet. This is necessary to obtain a rough flame for general heating, a fine-pointed flame being liable to cause perforation of the vessel, instead of producing a broad welding surface. If the compressed oxygen is to be all freely or generally used, the price charged must be greatly reduced, and, judging further first cost of the gas, I certainly can see no reason why so high a price should be charged, as the bottles last practically for ever, and the cost of compressing must be very small.

#### NOTES ON THE EARLY HISTORY OF PHOTOGRAPHY ON GLASS.

BY EDGAR CLIFTON.\*

WHAT is here written has mostly been extracted from the original publications of the various processes, and the writer feels that, although he might have been more original and perhaps more amusing if he had not done so, he has yet refrained from giving play to his imagination in order that he might adorn a rather dry tale. The moral he would point is that, as modern photographers, we ought to be thankful that we have had the way cleared for us by over sixty years of patient research.

Starting with the assumption that at the present time there is practically but one process, gelatino-bromide, employed for the production of negatives, it is interesting to look back on the early days of glass negatives, and to review the various methods of holding the sensitive salts which have from time to time found favour. The history of photography on glass may be said to commence with the history of practical photography itself, for we find the first mention of a glass-supported image as early as 1827, when M. Niepce offered to submit specimens of a process he called heliography to the Royal Society of London. As, however, he objected to disclose particulars of his discovery, the Society had, in accordance with one of its rules, to refuse to accept his communication, which was accompanied by several pictures on metal and glass plates, and which we now know were produced by the agency of light on a thin film of bitumen or asphaltum. This film differs from nearly every other, in the fact that it is sensitive of itself, and not merely a vehicle to hold a sensitive compound. The *modus operandi* is briefly as follows:—Enough pulverised asphaltum is taken to half-fill a wine glass, and upon this is poured, drop by drop, enough of the essential oil of lavender to cover it to a depth of about a quarter of an inch. The whole is now submitted to a gentle heat until the essential oil is fully impregnated with the colouring matter of the asphaltum. A thin coating of varnish so formed is now applied to a perfectly clean metal or glass plate, which, after having been carefully dried, is ready for exposure in the camera. This usually takes from four to six hours in bright sunlight, and is complete when a faint outline of the image is visible. The plate is then immersed in a bath of petroleum and oil of lavender, and developed in a manner very similar to a carbon print. There appears, however, to have been some uncertainty as to whether

a negative or positive result would be obtained, for speaking of two experiments on glass plates, M. Niepce mentions a phenomenon very much like that which we now call the reversed action of light. He says:—"In one of these trials the light acted in such a way that the varnish was removed in proportion to the intensity with which the light had acted, and the picture exhibited a more marked gradation of tone, so that viewed by transmitted light the landscape produced to a certain extent the well-known effects of the diorama. In the second trial, on the contrary, the action of the luminous fluid having been more intense, the parts acted upon by the strongest lights not having been attacked by the solvent, remained transparent, the difference of tone resulted from the relative thickness of the coating of varnish."

The celebrated Daguerre now appeared on the scene, and following up the researches of Niepce, produced pictures of great beauty and permanence on both glass (which he preferred) and metal plates, using various solutions of bitumens and resins for the sensitive coating. It is rather curious to note that he recommends backing the glass plates with white paper, in order to shorten the exposure, a discovery recently re-made in America for obtaining instantaneous pictures on gelatino-bromide. Heliography did not long survive the advent of Daguerre, for the superior rapidity and beauty of the process which bears his name resulted in the dethronement of bitumen for camera work, and its relegation to the useful, if less pretentious, office of producing engraved plates. With the wonderful discoveries of Talbot and Daguerre, this paper has nothing to do, except, perhaps, to mention that, in order to save expense, it was suggested to impress the Daguerreotype image on silver leaf supported on glass, and also to say that Mr. Talbot's invention of the negative process incited experimentalists to find a vehicle for the sensitive salts of silver which should be free from the many defects of a paper process, where the haloid salt was formed in the fibre of the paper support itself. Under these circumstances, it was but natural that glass plates should be again in demand, and we accordingly find, in 1839, that Sir John Herschel (to whom we are indebted for the word photography) used glass as a support for a very delicate film of chloride or other salt of silver, which was simply precipitated on the bare glass and exposed in the camera after floating with a solution of nitrate of silver. These plates gave results somewhat similar to the ordinary collodion picture, being positive or negative as they were either viewed by reflected or transmitted light. Very delicate manipulation was, however, required to avoid injuring the film, and the process was never practically worked, and was chiefly used for the demonstration of the action of the silver salts in the absence of organic matter, the purpose for which the inventor originally intended it.

In 1848 M. Niepce de St. Victor, a nephew of Niepce, introduced what was long known and practised as the albumen process on glass. At once the photographic world had a process which has hardly, except in point of rapidity, been surpassed by any subsequent invention. The plate was simply coated with bromo-iodised albumen, which was then dried and coagulated by heat. When required for use it was sensitised in aceto-nitrate of silver, and if required at once was exposed in the camera while wet. If a dry plate was required, the sensitive plate was dipped in a solution of gallic acid, then well washed with distilled water, and dried. The wet albumen plates required from two to thirty minutes' exposure, and the dry about double that of the wet. The negative was developed by a simple saturated solution of gallic acid. This process gave pictures of great delicacy, and was very reliable in its working, and when it is mentioned that it was long the favourite process of such photographers as Mayall, De Camotte, Negretti, and Sutton, it needs but little further testimony in its favour. In 1855, Mr. Mayall said that from a hundred plates he had made a hundred good negatives; large sizes, too, were worked successfully, 18 by 15 or 30 by 22 not being considered an out-of-the-way picture.

The success of the albumen process doubtless caused photographers to seek for a substitute which, while retaining the same delicacy of definition, should be more rapid in its action and more quickly developed, and in August, 1850, we find the first mention of the collodion process. M. Gustave Le Gray, of Paris, well-known as a skilful operator in all the photographic processes then practised, writes as follows:—"I have just discovered a process upon glass by hydrofluoric ether, the fluoride of potassium and soda dissolved in alcohol 40°, mixed with sulphuric ether, and afterwards saturated with collodion. I afterwards re-act with aceto-nitrate of silver, and thus obtain proofs in the camera in five seconds in shade. I develop the image by a very weak

\* A Communication to the North London Photographic Society.



solution of sulphate of iron, and fix with hyposulphite of soda. I hope by this process to arrive at great rapidity. Ammonia and bromide of potassium give great variations of promptitude. As soon as my experiments are complete, I will publish the result in an appendix. This application upon glass is very easy. The same agents, employed with albumen dextrine and give also excellent results, and are very quick."

These then were the words which heralded the process which brought photography into everyday use, and gave it an impetus which it has never lost. However, as when France had her Daguerre, England had her Talbot, so now Frederick Scott Archer came into the field, in March 1851, with a practical wet collodion process, which he had independently worked out, and which he now freely gave to the world perfect in every detail. In his preface Mr. Archer says:—"It will, therefore, be evident, that although Mr. Le Gray has the merit of having been the first to make known this valuable photographic agent, still, as he did not at the time of his publication produce it as a process, with the necessary details to make it intelligible to the photographer, his claim must in consequence be limited; and cannot, in justice, interfere with the merit of another party, who, from his own experience, made known a process with collodion, and that without any assistance from, or reference to, the labours of others in the same direction.

Now all the world rushed to be photographed, the Daguerreotype had to give way to the collodion positive, and the calotype to the collodion negative. In every street the photographer was to be found. The Photographic Society and the photographic journals sprang into existence, and there arose an army of amateurs almost, if not quite, equal in number to that which followed on the appearance of the modern dry plates. Photography became the talk of the drawing room, the street, and the studio, and there was what an Australian would call a "rush" to share in the gold which was then so readily to be had in exchange for silver in the form of pictures. Barbers, tobacco-nists, sign painters, and even colliers became photographers, and did a roaring trade at the same time, consoling the artists, who had trembled at first, by showing them that though easy to make a photograph, it still required an artist to make a picture; but pictures were made by photography, as the works of Rejlander, Adam-Salomon, and Lake Price, not to mention many who are still with us, abundantly testify. But admirable as the wet collodion process was, still the photographer, with that yearning for progress which always has, and we hope always will distinguish him, felt that if he could secure the portability of the calotype or albumen process, with something like the rapidity and delicacy of collodion, all would be well. This brought a whole crop of moist or dry processes, in which the plate was sensitised in the laboratory, and afterwards treated with a preservative solution, such as gallic acid, sugar, coffee, tea, beer, albumen, or gelatine. In fact, it would almost be easier to name a substance or liquid which had been used than one which had not. An outline of a few of the principal dry processes, based upon the collodion process, may be of interest.

First in order comes the wet collodion plate which has been simply washed free from the free nitrate and dried; after exposure it was re-dipped in the silver bath to restore to the surface the free nitrate necessary for the development. It was soon found, however, that the collodion became impenetrable when dried, and that besides being difficult to develop, the film was exceedingly liable to split and leave the glass during development or afterwards. To remedy this defect, in 1856, Dr. Hill Norris suggested a coating of plain gelatine solution about eight or ten grains to the ounce, which was poured over the washed collodion plate and allowed to dry. This process gave fair results, but was ultimately superseded by its most powerful rival, collodio-albumen, one of the most certain of dry processes, and one capable of yielding negatives or transparencies of the highest quality. In this case the plate is first sensitised as for the ordinary wet process, and then coated with iodised albumen, and again sensitised, thoroughly washed, and dried. Any mention of this process naturally suggests the name of Mr. Ackland, who was one of the earliest workers in collodio-albumen, and still continues to employ it for transparencies, for which its clearness and brilliancy render it peculiarly suitable.

Only passing notice can be given to the "moist plate" processes, in which the plate, after sensitising, is coated with nitrate of magnesia or other deliquescent salt, as recommended by Messrs. Spiller and Crookes, or with oxymel or honey, according to the methods of Llewellyn and Maxwell Lyte.

Although of little or no practical value, the following details

of a wet gelatine process, communicated to the *Journal of the Photographic Society* in 1856, will, now that we are so firmly attached to gelatine, be worth giving in an abridged form. The letter is signed "E. R.," and is dated from Tavistock. After detailing the advantages of gelatine as a film-forming substance, the author tells us to dissolve ten grains of iodide of ammonium in one and a-half ounces of water, and to add to this twenty-six grains of gelatine (Swinburne's), and allow it to soak for half an hour, dissolve, filter, and coat the plates as with collodion. When quite dry they will keep for a length of time, and when required for use they are excited in a thirty-grain silver bath and exposed while wet. They are to be developed with a twenty-five grain iron developer slightly acidulated with tartaric acid, and fixed with hyposulphite. The author notes the long time which is occupied in dissolving out the unaltered iodide when compared with a collodion plate, and also cautions the operator against allowing the silver bath to become acid, for fear of dissolving or loosening the film.

Emulsion processes and alkaline development are not now treated of, simply because they belong to the later rather than to the early history of photography, and the writer's endeavour being to put before his (photographically) younger brethren a short statement of the various trials and labours which have been endured by the pioneers of our art, and which have paved the way for the manufacture of plates such as a quarter of a century ago would have been priceless, but which now cost only a shilling a-dozen.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

BATH FOR REGENERATION OF FADED ALBUMEN PRINTS—SULPHATE OF ALUMINA FOR CLEARING AND HARDENING GELATINE PLATES—SILVER INTENSIFYING—PHOTOGRAPHY AND METEOROLOGY—HYDROKINONE DEVELOPER—FIRST DAGUERRETYPE MADE AT BERLIN—CRONENBERG'S PHOTOGRAPHIC INSTITUTE AT GRONENBACH.

*A New Combined Toning and Fixing Bath for the Regeneration of Faded Albumen Prints.*—Mr. H. Zandaurek, of Teschen, to whom was delivered by the Photographic Society of Vienna an entirely faded, yellow albumen print, seventy days old, toned and fixed it, and returned it to the committee of examiners in a perfect state of finish. For the indication of the working details of this valuable method a silver medal was awarded to him by the above-named Society. According to the *Correspondenz* the method is the following:—

### I.—Toning Bath, Stock Solution.

A.—Distilled water...	...	5,000 c.c.
Tungstate of soda	...	100 grammes
B.—Distilled water...	...	400 c.c.
Carbonate of lime (chem. pure)	...	4 grammes
Chloride of lime	...	1 gramme
Gold and sodium chloride	...	4 grammes

The mixture, which is made in a yellow glass bottle, must be well shaken, allowed to stand for twenty-four hours, then filtered into another yellow glass bottle, and kept well stoppered.

For use, mix (for one sheet of albumen paper):—

Solution A	...	...	150 c.c.
Solution B	...	...	4 to 8 c.c.

When the prints have been washed they are placed one by one in this bath. They should tone not too quickly—in summer time not before ten minutes—therefore the bath should never contain an excess of gold chloride. With this bath beautiful clear purple tones are obtained.

### II.—Fixing Solution.

Solution A	...	...	150 c.c.
Hyposulphite of soda	...	...	15 grammes

After the prints have been washed they are placed one by one in this fixing bath, and allowed to remain there until their yellowish colour has entirely disappeared, which, in



some cases, will require three to five hours. After fixing, the prints are thoroughly washed.

*Sulphate of Alumina as a means for Clearing and Hardening Gelatine Plates.*—In the *Archiv*, Dr. Lohse, of the Potsdam Observatory, describes his experiments with sulphate of alumina, which he used for clearing and tanning gelatine plates instead of a solution of alum. The alum, whilst dissolving only partly in water, shows a very decided tendency to crystallizing; consequently, solutions of alum can be kept only for a comparatively short time in open dishes without the crystals of alum dissolving out. The sulphate of alumina, which comes into the market in amorphous pieces, is much more soluble than the alum, and shows not the least tendency to crystallizing. Whilst the sulphate of alumina dissolves in twice its bulk of water, the alum at ordinary temperature requires at least six and a-half times as much of water. The aluminium sulphate should, therefore, be preferably used as a remedy against the frilling of gelatine plates, for clearing the finished negatives in the toning baths, and for all other photographic processes in which hitherto the different kinds of alum have been employed, so much the more as this salt, besides the above-described advantages, possesses all the properties of the alum in a higher degree.

*Silver Intensifying.*—The formula of Mr. Farmer's improved silver-intensifier, which was published in the *PHOTOGRAPHIC NEWS* some months ago, has been translated by almost all our German photographic periodicals, and has excited considerable interest, for professionals as well as amateurs are longing for an intensifier which makes it possible to abandon the bichloride of mercury and other poisonous substances. Captain Himly, who has himself recently introduced a new intensifier, one with salts of lead, which he brings into the market, says, that after many experiments he has come to the conclusion that the formulas published by Mr. Farmer only give negative results; but not all operators are of the same opinion. Mr. E. Selinger, of Olmutz, a very clever photographer, writes in the *Wochenblatt*, that he at once, after the publication, tried the formulas of Mr. Farmer, and that he was very satisfied with the results. The more I was astonished, he continues, "that Mr. Himly declared this method useless. I have since that time intensified all my negatives which required it, exclusively by this method. I will admit, that I proceeded not quite exactly in the described manner. For the first experiment I used a number of rejected, unexposed gelatine plates, of which I treated as many with a fresh solution of hyposulphite of soda, until the latter was saturated with silver bromide. The solution was then diluted with water, and employed in the same manner as described; at first, the silver solution seemed to be still too strong, but after I had diluted it somewhat more, I obtained very good results. I used also the developer diluted, and kept it slightly acid. Subsequently I prepared a greater bulk of silver solution by precipitating silver bromide, washing it, and saturating with it a solution of hyposulphite of soda." I have repeated Mr. Selinger's experiments, and obtained also very satisfactory results. At all events, this new method of intensifying should be tried by all operators, for it is worthy of a trial.

## Reviews.

THE LITHOGRAPHER'S AND PHOTOGRAPHER'S DIRECTORY for 1887-1888. Price five dollars. (New York: The Lithographic Publishing Company, 12, Centre Street.) PHOTOGRAPHY and the printing trades—especially those which have branches bearing on lithography—are so intermixed that we think the compilers of the volume under notice have exercised a wise discretion in classing both together as far as the Directory is concerned.

The work appears to be complete and accurate—at any

rate, if we may judge by numerous test references we have made—and as it includes the principal houses in collateral branches of industry, it is likely to prove of value to experimentalists who wish to obtain special articles.

Our readers should of course understand that this is not a Directory of English Photographers and Lithographers, but of those of the New World (United States, Canada, Mexico, Central and South America).

## Notes.

A number of portrait and group studies sent to us by W. Adcock merit notice. The injured foot, reproduced as an engraving, in the *Children's Friend*, shows a lad seated on a rush-bottomed chair, and studying a splinter in his foot; but the pleasantest and most human little study in the series is, to our liking, an out-door infant school.

There is a touch of feeling in "Not all content," a woman winding yarn of a swatch held by a man; these being the content, while the non-content is a woman sitting half back to the pair, and who has an unregarded book on her lap. This might form a base for a picture Orchardson.

The multiplication of galleries for the exhibition of pictures has not made the slightest difference in the number sent in this year to the Royal Academy. Upwards of nine thousand pictures, of which three thousand are landscapes, have been received, and as the average number hung is under two thousand, the work of the judges and of the hanging committee must be very laborious. Under these circumstances, perhaps, it is vain to hope for the admission of photographs even in the architectural department, where highly-coloured and altogether unnatural designs for buildings are admitted.

A useful purpose is served when an actor is photographed in character, apart from gratifying the curiosity of the public and advertising himself. It enables another actor who undertakes the same character to imitate the original more faithfully. Arrangements have been made by the management at the Princess's Theatre to produce "La Grande Manière," a piece which has made a hit at the Porte Saint Martin, and besides obtaining all the costumes and effects, drawings and photographs of the facial expressions and of the general appearance of the actors in each part have been procured, so that the representation in London will be as nearly as possible a reproduction of the one in Paris.

A suggestion which we made some time ago is about to be carried into effect by the authorities of the British Museum. This is the reproduction by photography of the principal drawings by the old masters, for distribution to provincial art museums and public libraries. The cost is to be defrayed out of a special grant by the Treasury, and the reproductions will be accompanied by a critical text by the Keeper of the Print Department, Professor Colom. Public libraries are increasing in number every year, and their usefulness will be much enhanced by the



facilities which photography offers for the multiplication of rare and valuable prints.

A curious characteristic of the meetings of the Photographic Society is the effusive way in which a vote of thanks is accorded to the reader of a paper. The ordinary holding up of hands is apparently not sufficiently demonstrative, and nothing less than a vigorous clapping is considered worthy of the occasion. We have not the slightest objection to this ebullition of feeling, which, of course, is very laudable. We only wonder why? It may be that the members overflow with gratitude to anybody who will run down and read a paper, because occasionally there is a risk of having no paper at all. Another theory is, that on account of the exemplary discipline maintained at the meetings, some outlet for the pent-up energies of the members is absolutely required. A third supposition also occurs to us: the President asks for a vote of thanks in a manner so impressive and weighty, that for the moment the meeting may have a vague notion it is doing something equivalent to conferring the freedom of the City on a statesman, or conveying the thanks of a grateful nation to a victorious hero. Anyway, it is worth reading a paper at the Photographic Society, in order to get the applause, which we are bound to say is bestowed most liberally and impartially, whether the paper be long or short, interesting or dreary. Perhaps, if there is any difference, the dreary papers get the most—the applause in this case being a sort of fervent offering up of thanksgiving that the end has come.

Since the advent of photography, those interminable and expensive lawsuits known as “ancient light” cases have been much simplified. In the old times, when a new building was erected obstructing the light of an adjacent house, the difficulty always was how to make a jury know what was the condition of things previous to the new erection. What is done now is to photograph the old building before it is replaced by the new and objectionable structure, or photograph the open space, if there happens to be one, and the exact condition of things is at once made evident. In the City of London these “ancient lights” are jealously guarded, as in a crowded neighbourhood serious injury to property may be caused by the sudden rearing up of a modern five or six-storey building such as is so common now-a-days. A well known city photographer tells us, that of late years he has had a multitude of commissions to photograph buildings where “ancient lights” are concerned.

A recent trial in Brussels in which the name of Jan Van Beers has been especially prominent, and the correspondence which has followed, have led to a revival of the controversy which formerly raged over the question, how far the artist we have named availed himself of the services of photography in his pictures. At the time the matter was originally discussed it was openly asserted that one of the Van Beers pictures, a well known yachting scene, was really and truly nothing but a painted photograph. Proof of this assertion was not forthcoming, however, and a verdict in favour of the artist was given in the action that

was tried. A similar statement is being again made, but those echoing it surely forget that they are setting themselves a virtually hopeless task when they try to convict Jan Van Beers of making the camera his artistic ghost. They attempt, in fact, that proverbially unsatisfactory operation known as trying to prove a negative.

Parisian photographers, at all events, have good reason to bless Boulanger, for had he expected that his *carte* would carry him into the Chamber as successfully as his famous black horse had carried him into public popularity, he could not have scattered the former more lavishly through the departments he has been contesting. He has been taken, for electoral purposes, on his horse and off it; in his General's uniform and out of it; in profile and in full face; in *carte* and in cabinet; and the resulting photographs—whole bales of them—have been sent wherever a bye-election has been going on or is likely to take place.

A would-be facetious correspondent writes to ask us how much wheel tax photographic *cartes* will have to pay should Mr. Goschen's Budget proposal as to the wheel tax become law. The answer to this conundrum is of course simple: the tax will be identical with that paid on the “Van of Progress.”

Lord Wolseley's well-known wish to associate the score of different uniforms worn by our soldiers with something like uniformity, is said to have found an enthusiastic supporter in the House of Commons, and when the army estimates are next discussed this M.P., it is said, will be prepared to strengthen his case against uniforms which have no uniformity, by unfolding before the eyes of the House a sort of panoramic view which he has been preparing, consisting of a series of 153 coloured photographs, each of which represents a uniform differing more or less from the other 152. The collection of photographs, many of them specially taken, is a most interesting one.

Thus he is able to show a series of military head-coverings, actually in use at the present time, consisting of upwards of fifty different specimens, from the guardman's bearskin to the drummer boy's Glengary cap. And of these, be it remembered, when our men are actually armed for foreign active service, about nineteen-twentieths have to be left at home.

We have often referred to the strange things which some of the people delight in photographing over collecting photographs. The other day we referred to that enthusiastic amateur who had been filling a specially made album with photographs of quaint public-house signs; and now we hear of another who makes a point of taking a (photographic) “snap-shot” at the locomotive of every train he travels by. To us it seems that he would obtain a more interesting collection of negatives if he made “Prenez Guard!” his motto, and took the tenant of every brake-van. Or why not start an album of “Cab Horses which have drawn him,” or “Bus Drivers he has hailed?”



## Patent Intelligence.

### Applications for Letters Patent.

- 18,039 of 1887. MAURICE HIPPOLYTE CHARLES WASHINGTON FARJASSE, 28, Southampton Buildings, Chancery Lane, London, W.C., for "Improved apparatus for taking positives from photographic negatives."—Received April 12, 1888. Antedated November 12, A.D. 1887. Under International Convention.
- 5,140. JAMES HINES, EDWARD HOWELL, and ALFRED HOWELL, 96, Buchanan Street, Glasgow, for "Improvements in the modes and means or apparatus for taking and producing photographs, and in appliances connected therewith."—April 6th, 1888.
- 5,192. HERMANN VANDYCK, 20, Ladbroke Grove Road, Notting Hill, for "Improvements in photographers' glass gauge plates."—April 7th, 1888.
- 5,194. HEINRICH LUDWIG HUGO SCHRODER and JOHN STUART, 47, Lincoln's Inn Fields, London, for "Improvements in lenses."—April 7, 1888.
- 5,419. EDWARD MARLOW, 28 and 30, Constitution Hill, Birmingham, for "Improvements in photographic cameras."—April 12, 1888.
- 5,462. ANKETELL MATTHEW HENDERSON, 4, South Street, Finsbury, London, for "An improved dark slide for photographic cameras, and improvements in cameras to be used therewith."—April 12, 1888.

Patent which has become Void through Non-payment of the Fourth Year's Renewal Fee.

8 of 1884. F. W. HART.—Cameras.

### Memorandum.

\* \* Attention is called to the following article of the International Convention, for the protection of industrial properties.

By Art. 4 of this Convention any person who has duly applied for a patent in any one of the contracting States will have six months' right of priority in any of the other States, should he choose to apply for a patent there.

An International Office in connection with the Convention has been established at Berné, Switzerland, which publishes a monthly periodical entitled "La Propriété Industrielle." The yearly subscription (including postage) for all countries within the Postal Union is 5 francs 60 centimes, and should be forwarded by money order to MM. Jent and Reinert, Imprimeurs, Berné.

The International Convention has been concluded between the following States:—Belgium, Brazil, France, Great Britain, Guatemala, Italy, Netherlands, Norway, Portugal, San Domingo, Servia, Spain, Sweden, Switzerland, Tunis, United States of America.

A copy of the Convention may be obtained for 2d. through any bookseller.

### Specifications Published.

- 11,136. HENRI BOGAERTS, of Brussels, in the Kingdom of Belgium, Directeur de la Société Anonyme l'Imprimerie Artistique, représentée par Monsieur le Comte de Mees, President du Conseil d'Administration, for "Process and means for the production by the zincographic process of imitation wood, copper, or steel engravings."—Dated, 15th August, 1887.

The present invention has for its object a new process for imitating in a perfect manner, by zincography, engravings on wood as well as those on copper and on steel.

The invention consists in projecting, by means of suitable projection apparatus, the image of the object to be reproduced on a sheet of caoutchouc or paper previously prepared, then in photographing the image thus obtained, which is transferred to zinc or copper by the known means.

In carrying out the invention, I prepare, in the first place, a paper, or preferably a sheet of caoutchouc, by printing on it by an engraving or any other suitable process, lines such as are employed in wood engravings. On the ground thus prepared I project, by means of a projection apparatus, the image which I desire to reproduce. This image may be produced by placing directly in the projection apparatus the negative of a photograph, or the image of an opaque solid object in a mirror.

This image, projected on the paper covered with lines, is itself covered with these lines, which appear more or less strong, according to the shades of the projected object. If a single sheet

of caoutchouc is used, it may be stretched more or less in whole or in part, rendering the lines more or less wide apart, and more or less curved.

By photographing the image thus obtained, a negative is produced with all the lines on it, so that it resembles, and may even be mistaken for, a reproduction from a wood engraving.

In order to imitate copper or steel engravings, a ground of crossed lines may be produced, or a ground with simple lines being produced as above described, a negative with similar lines may be placed in front of the negative that is to be produced, or behind the object to be projected, in such an attitude that its lines cross at a suitable angle those on the paper on which the image is projected. The lines are then projected at the same time with the object that is to be reproduced, and the projected image appears with the lines forming diamonds such as are found on copper or steel engravings, and these are reproduced exactly by the photography.

The image of the object to be reproduced may, in like manner, be projected on a sheet of transparent gelatine which has a positive of simple or crossing lines, and which may or may not be elastic.

The image of the object to be reproduced may also be projected through a positive of simple or crossing lines, as the case may be, on a sheet of transparent gelatine, which may be rendered elastic or not by known processes, and the image thus projected may then be directly photographed.

In this case, the sheet of gelatine is arranged within a frame having sides sufficiently long to form a kind of dark chamber open at both ends. The projection apparatus is placed facing one of these open ends, and facing the other is the photographic apparatus, which reproduces the image transmitted through the transparent sheet.

The photographs thus obtained are transferred to zinc or copper by any suitable process.

Having now particularly described and ascertained the nature of this invention, and in what manner the same is to be performed, I declare that what I claim is:

1. The process consisting in photographing images projected by a suitable apparatus on a sheet of caoutchouc, paper, or other material on which have previously been imprinted lines such as appear in wood engravings, or in copper or steel engravings.

2. The use, in carrying out the process referred to in the preceding claim, of a sheet of caoutchouc, which can be stretched as desired, so as to vary the direction and spacing of the lines, substantially as herein described.

3. In carrying out the process referred to in the preceding claims, the method of projecting together with the image on the lined ground the image of other lines differing in direction to those on the ground, so as to produce diamond crossings.

4. In carrying out the process referred to in the previous claims, the method of projecting the image upon a prepared ground consisting of a sheet of transparent gelatine, and then photographing by transmission the image thus projected, substantially as herein described.

5. The combined process of first producing by photography images on a lined ground, in the manner set forth in the preceding claims, and then reproducing such photographs by zincography or analogous processes.

- 7,121. GEORGE DOWNING, of 8, Quality Court, Chancery Lane, in the County of Middlesex, Patent Agent, for "Improvements in the method of focussing the object glasses of cameras and in apparatus therefor."—Dated May 16th, 1887.

The Patentee says:—

The object of this invention is the immediate and accurate focussing of the objects requiring to be photographed. It is based upon a known principle which can be easily demonstrated, and which is as follows:—When an object of constant height is placed at various distances from an object glass, there exists a constant ratio between the angle formed by the visual rays of the operator, directed to the upper and lower extremities of the object, and the length of the foci of the object glasses producing at each of these distances a clear image of the same object, or in other words, "the distance to which an object glass must be shifted in order to obtain upon a fixed screen clear images of an object placed at various distances is always in the same ratio with the angles formed by the visual rays issuing from the eye of the operator and directed to the upper and lower extremities of the object in these different positions. In order to measure the above-mentioned visual angle I use a pair of compasses or dividers placed above the camera, the legs being caused to move with the



object glass at the time of adjustment. For this purpose the divider carries upon its upper leg an appendage or projection from which issues a connecting rod fixed to the other leg at an equal distance from the pivot. Another connecting rod or link connects the first connecting rod with the upper arm of a rectangular link movable upon an axis, and whose lower arm is joined by a third rod to the movable part of the object glass. The result of this arrangement is that if the object glass is caused to advance or to retrograde by turning the head or knob of the rack, the compasses are at the same time opened or closed, and the angle of opening of the latter is dependant in a determined ratio upon the movement of the object glass. A sight-piece is also fitted composed of a metal plate having a simple circular opening formed therein arranged to coincide with the axis of the apparatus, so that the vertical plane of the opening may coincide with that of the axis of the object glass, is fixed above the sensitive glass at a level with the dividers, and enables the operator to see, between the legs of the latter, the objects the sight of which it is desired to adjust. Under the conditions, there remains but to regulate the apparatus, that is to say to give to the legs of the compasses or dividers and to the arms of the links suitable lengths, so that the greatest opening of the compasses may correspond with the longest focus of the object glass, while in like manner the smallest corresponds to the smallest focus; and also, in order that the opening of the legs of the compasses should be always equal to the height of the images obtained upon the object glass. For this purpose the two extreme foci of the object glass are determined by means of the unpolished glass, the shortest or principal focus, and the longest or useful focus, that is to say, the focus producing upon the sensitive glass the largest and clearest possible image of the object upon which it is intended to adjust the instrument. The principal focus is obtained in the usual manner by adjusting the instrument. The principal focus is obtained in the usual manner by adjusting upon the unpolished glass a very distant object. For the longest useful focus I use an object serving as a basis for the regulation, and which, for practical purposes, is ordinarily a man of medium height, or the animal which has most frequently to be photographed; it is placed before the object glass at a suitable distance in order to have at the same time as large and as clear an image as possible; the places at the two foci thus obtained are marked upon the frame or support of the apparatus, and the distance between the two is carefully measured. The two extreme angles of opening of the compasses or dividers are next ascertained by first closing them to the smallest angle of opening, and then, by opening them sufficiently for the distance between its points, to be equal to the height of the greatest image of the subject clearly obtained upon the unpolished glass. During this operation the end of the upper arm of the link is shifted, the extremities of its stroke are ascertained, and its extent is measured. There now only remains to calculate the respective lengths required for the legs of the compasses and the arms of the link in order to cause the longest and the shortest focus of the object glass to correspond with the largest and the smallest opening of the legs of the compasses, which can be easily effected by using as a basis the means before mentioned. The regulation is thus rendered complete, for it will be obvious that in order to adjust the instrument for a man of medium height, whatever may be the distance at which he is placed from the object glass, it will be sufficient to sight him through the sight-piece by opening the legs of the compasses until their points coincide with the upper and lower extremities of the subject, as the angles at which the operator sees the object at the various distances are proportionate to the shifting motions of the object glass. The above described mode of regulation may be effected with any other object, the same compasses being used, while on its legs can be fixed from distance to distance lateral and not very prominent points acting in a similar manner to the principal points used for the man. This instrument may be applied to any camera.

#### Patents Granted in America.

376,802. ALFRED A. HART, NEW YORK, N.Y. for "Method of making photographic pictures," assignor to himself, Arthur C. Rowe, Orange, N.J., and George C. Leavenworth, Louisville, Ky.—Filed July 27, 1887. Serial No. 245,461. (Specimens.)  
*Claim.*—1. The process of photographic copying, consisting of first, throwing an image of the thing to be copied upon a screen in a dark-chamber, the surface of which screen is composed of actinic and non-actinic parts; and, second, taking a photograph of such image as appearing on the screen.

2. The process of making photographic lined pictures, consisting of, first, throwing an image of the picture upon a screen in a dark-chamber, the surface of which screen is subdivided more or less minutely into actinic and non-actinic lines or dots; and, second, taking a photographic picture of such image.

3. The process of making photographic lined pictures, consisting of, first, throwing an image of the picture upon a screen in a dark-chamber, the surface of which screen is subdivided more or less minutely into actinic and non-actinic lines or dots; second, varying by manipulation the relative proportions of the actinic and non-actinic sub-divisions of the screen at different points on the image, so as to modify the lights and shadows therein as desired; and, third, taking a photographic picture of such image as so treated.

4. The process of making photographic lined pictures, consisting of, first, throwing a negative image of the picture upon a screen in a dark-chamber, the surface of which screen is subdivided more or less minutely into actinic and non-actinic lines or dots; second, varying by manipulation the relative proportions of the actinic and non-actinic subdivisions of the screen at different points on the image, so as to modify the lights and shadows therein as desired; and, third, taking a photographic picture of such negative image as so treated.

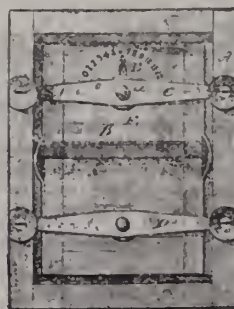
5. The process of making photographic lined pictures, consisting of, first, throwing an image of the picture upon a screen in a dark chamber, such screen having a rough surface, the elevations of which are made actinic and the depressions non-actinic (or *vice versa*); second, varying the relative proportions of the actinic and non-actinic sub-divisions of the screen at different points on the image, by rubbing over it chalk or other friable material, so as to modify the lights, shadows, or design of the screen; and, third, taking a photographic picture of such image as so treated.

6. The process of making photographic lined pictures, consisting of, first, throwing a negative image of the picture upon a screen in a dark chamber, the surface of which screen is subdivided more or less minutely into actinic and non-actinic lines or dots; second, varying by manipulation the relative proportions of the actinic and non-actinic sub-divisions of the screen at different points on the image, so as to modify the lights and shadows therein as desired; third, taking a photographic picture of such image as so treated; fourth, throwing upon the screen an image of the resulting lined positive picture; and, fifth, taking a photographic picture of such image.

7. The process of preparing photographic pictures for printing in several colours, consisting of, first, throwing an image of the entire picture upon a non-actinic screen in a dark chamber; second, making actinic that portion of the screen which corresponds to the portion of the picture to be printed in a given colour; and, third, taking a photographic picture of the partial image thereby made to appear upon the screen.

8. The process of preparing photographic pictures for printing in several colours, consisting of, first, throwing an image of the entire picture upon a non-actinic screen in a dark chamber, the surface of which screen is composed of more or less minute elevations and depressions; second, making actinic either the elevations or depressions upon that portion of the screen which corresponds to the portion of the picture to be printed in a given colour; and, third, taking a photographic picture of the lined partial image thereby made to appear upon the screen.

376,840. LEO F. ADT, Waterbury, Conn., for "Photographic-printing frame."—Filed Nov. 21, 1887. Serial No. 255,709. (No model.)



*Claim.*—1. In a photographic-printing frame, the combination



of the back, the spring-bar C, pivoted upon the back and adapted to engage the sides of the frame, with a pointer, also pivoted upon the back and between the bar and the back, substantially as described, and whereby the pointer is secured by the elastic force of the bar when it engages with the lugs on the frame.

2. The combination in a photographic-printing frame of a back, a spring-bar hung upon a pivot on the back and adapted to engage the sides of the frame, a pointer hung upon the same pivot as the bar and between the bar and back, with a washer between the bar and pointer, through which washer the pressure of the spring-bar is communicated to the pointer when the bar engages with the lugs on the frame, and the back provided with a series of figures concentric with the axis of the pointer, substantially as described.

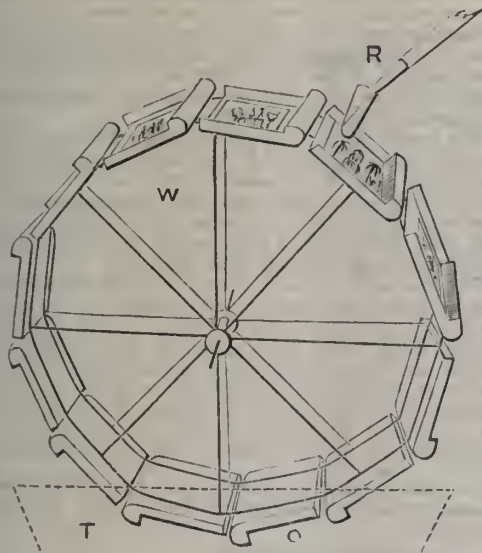
## Correspondence.

### A PRINT-WASHING WHEEL.

SIR,—In the PHOTOGRAPHIC NEWS YEAR-BOOK for 1888, Mr F. C. Beach has described and illustrated a print washing-wheel, an account of which was sent by me, without illustration, to the *British Journal of Photography* early last year. Mr. Beach has not only very cleverly drawn a picture from my somewhat vague description, but he has added an ingenious improvement of his own for rocking developing dishes.

If you think it of sufficient interest to your readers, and if you have the space to spare, I hope you will publish this communication; and I shall be glad by this means to let Mr. Beach see what my wheel is like.

I have had it in use for a year. The diagram I send is from a photo of the wheel. It is two feet in diameter,



W, skeleton wheel 2 ft. diameter, carrying 12 tin plates, 7 ins. wide by 6 ins. long, for prints. R, flat rose 7 ins. wide. T, outline of water trough.

and carries round its circumference twelve tin (or, better still, zinc) plates, with their side edges turned up quarter-inch, and their bottom edges turned up into small troughs.

Each of these plates is large enough to take one cabinet print, which, when wet, adheres firmly to the smooth surface, and requires no other fastening.

Each plate is 7 inches wide, and, as there twelve of them to a 24-inch wheel, about 6 inches long, including its trough.

The prints are washed by water from a flat rose, 7 inches wide, with a single row of holes about  $\frac{1}{8}$  of an inch apart. The water, by filling the troughs, turns the wheel, on the principle of the overshot water-wheel.

Below is a water-trough through which a small segment of the wheel passes, thus giving the prints a further wash.

By means of a hole cut in the side of this water-trough the water should be kept at such a level as not to submerge each print, as it passes through, by more than about half-an-inch at most; for, if the water be too deep, the prints are apt to wash off.

My wheel is made entirely of tin, and is very light, turning easily. It is roughly made from old kerosine tins by a native tinman.

In it, the plates carrying the prints follow the curve of the circumference of the wheel, instead of being at right-angles to it, as in Mr. Beach's illustration; by the former plan the wheel takes up less room, and is less liable to damage—mine has just travelled 1,300 miles by goods train without injury. S. L. DOBIE, Surgeon-Major.

Botacamund, India, March 1st, 1888.

### DIFFUSION OF FOCUS.

SIR,—In reply to Mr. Debenham's letter in your last issue, there is but little for me to add to my two previous letters. As Mr. Debenham appears to set a high value upon my opinion concerning Lake Price's statement about "increasing the depth of perfect focus," I would say without the slightest hesitation or unwillingness that my opinion depends upon the meaning attached to the word "perfect." Accepting this word in the sense in which I think we are entitled to suppose that Lake Price used it, I do not see that the statement has been shown to be in error. If, however, the word "perfect" is interpreted literally, the statement becomes to my mind altogether unmeaning. A mathematician who was nothing more, would be misled if he accepted the statement, but I do not believe it is calculated to mislead those to whom it was addressed. Literally, there is no such thing as "depth of perfect focus."

The statement in Mr. Debenham's letter, that I professed myself "unable to judge between the conflicting statements of Grubb and J. H. Dallmeyer," is not correct, and the observation concerning me, that "it is not easy to see why he should have intervened in the discussion," is, to say the least of it, irrelevant.

But I am fairly surprised when I read that "to quote opinions of photographers as an authority on matters which are susceptible of mathematical proof or of direct experiment, is an absurdity." If that statement bears upon the question at all, I can only understand it as charging me with absurdity, and condemning Mr. Debenham himself as no "authority." I am quite willing to believe that I do not understand the sentence, and I am not curious to enquire concerning it.

Now that it has been considered worth while to reproduce Grubb's diagram, it will be convenient for me to indicate wherein I consider his demonstration incomplete. The gain within the focal point is not disputed, therefore we may pass that by. Without the focal point there is indicated a disc of confusion of diameter 190 in the upper figure, and 260 in the lower figure—apparently a very obvious loss in depth of definition. But while the disc of confusion in the first case is equally illuminated, the disc of confusion in the second case has a brightly illuminated centre, surrounded by a halo that gets fainter towards its outer part. Taking the more luminous core as representing the image, there is a very large gain in depth of definition; but if the whole disc of confusion were equally illuminated, there would be a loss. It is convenient in common language to distinguish between an image and a halo, and a theory which confuses them is practically incomplete. I cannot conceive it possible to frame a theory that shall draw a line between the practical image and its surrounding halo in this case; hence I regard Grubb's demonstration as necessarily incomplete, even allowing for the moment that his simple diagrams represent the actual state of affairs in its entirety.



As I do not believe it possible to settle this question by any theory or mathematics or diagrams, and that it is a question of circumstance and personal preference rather than geometry, I criticised no theories until obliged to do so.

As no one has attacked the only position that I sought to establish by addressing you on this question of "diffusion of focus," and as other aspects of the matter have been pretty fully and very ably dealt with by Mr. W. H. Wheeler and Mr. T. R. Dallmeyer, I trust to be exempt from further correspondence.—I am, &c.,

CHAPMAN JONES.

#### DIFFUSION OF FOCUS.

SIR,—To wilfully make a garbled quotation which alters the sense of the original is a thing so unworthy and contemptible that I must at once reply to Mr. T. R. Dallmeyer's complaint. What I quoted was what I, being present at the meeting, understood him to say. His paper has, since I wrote, been published, and as it now appears, there are qualifying words modifying the sense. The argument, however, does not in any way depend upon any admission or statement of Mr. Dallmeyer's, but is complete in itself.

Mr. W. H. Wheeler, quoting with approval from Mr. T. R. Dallmeyer, describes the effect of spherical aberration as giving "a sharp point surrounded by a halo." Does it not occur to Mr. Wheeler that it ought to be stated, that for objects in a nearer plane than the focal one, this definition does not hold good, and that on the contrary, the edge of the halo is in this case brighter than the centre? It is obvious that this condition is more destructive of definition than the even circles of light given by a properly corrected lens.

To make this matter of halos intelligible to those who have not made optics a study, take the front combination of a portrait lens, and focus on a piece of white paper in a darkened room, the image of a bright spot—say a candle flame—at from ten to twenty feet distance. In the first place, focus in the position of least spherical aberration, i.e., with the convex side of the lens towards the light. On moving the image in and out of focus, but little difference will be noticeable in the two directions. Now reverse the lens, so as to use it with the convex side nearest to the paper, in the position of greatest spherical aberration. It will be seen that as the lens is moved beyond the focus, there is, as described, a bright spot surrounded by a halo (a large one, however). On moving the lens nearer to the paper, the image of the spot will take the form of a circle, brighter at the edges than at the centre. This is the condition—a representation of points by rings—which obtains when objects nearer than those focussed are photographed with a lens having positive spherical aberration.

As to the image of objects farther than the focal plane, the very large halo may be a worse evil than the mere want of sharpness. I have seen a photograph in which the large halos surrounding bright lights gave a much more untruthful effect than that due to ordinary want of sharpness. These halos have also the effect of dimming the brightness of shadows in their vicinity, much in the same way as that generally recognized as halation.

The real point at issue has, I am afraid, been somewhat obscured; it is this—J. H. Dallmeyer, in introducing a certain lens, said that by sacrificing definition at the focus, better definition was obtained in the out-of-focus planes. I opposed this pretension at the time, and maintain now that, on the contrary, the sacrifice of sharpness at the focus is accompanied by a general sacrifice of definition.

The tendency of Mr. T. R. Dallmeyer's and Mr. Chapman Jones's writings and quotations is to make photographers believe that Mr. J. H. Dallmeyer's claim just referred to is true. Will they venture to say directly that it is so, or if not, will they have the candour to acknowledge that it was unfounded, and that my contention is a just one?—

Yours,

W. E. DEBENHAM.

#### ELECTRICITY AND LIGHT.

SIR,—The paragraph "Influence of Light, &c.," in your issue of April 13th, quoted from *The Philadelphia Photographer*, is a translation of a recent paragraph in my English correspondence to the *Moniteur de la Photographie* of Paris, which paragraph appears to have been taken without acknowledgment by the Philadelphia journal.

During the twenty years or so that I have written the "Correspondence d'Angleterre" in the French journal just named, I have seen hundreds of my paragraphs taken in the same unscrupulous manner, especially by Belgian and American prints, and I have rarely made any observations on the subject; but when an old and established English journal like the *Photographic News* reproduces such an article, and quotes the American journal as the original source of information, I think some notice should be taken of the fact.—I am, sir, your obedient servant,

T. L. PHIPSON, M.B., PH.D., F.C.S.,

English Correspondent to the *Moniteur de la Photographie*.  
*Laboratory of Analytical Chemistry, Putney, April 16.*

PS.—I did not spell the names Somerville and Moricini as they are given. It may be as well to state that as early as 1825, Mr. Christie, a Fellow of the Royal Society of London, found that when a magnetic needle is caused to vibrate under the influence of the solar beam, the result is to augment the rate of oscillation, and to bring the needle more rapidly to rest. Sir William Snow Harris, some years afterwards, found this did not occur when the needle was caused to vibrate in a vacuum.

#### Proceedings of Societies.

##### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

At the ordinary monthly meeting of this Society, held on Tuesday last, the 17th inst., the chair was taken by JAMES GLAISHER, F.R.S., President.

It was announced that the balloting for the new rules had resulted in their being accepted by a large majority, and that, in conformity with one of those rules, the name of a gentleman now proposed as a member would be read and then balloted for at the next meeting.

A paper communicated by W. K. BURTON, now of the Imperial University, Tokio, Japan, entitled "A Few Words on Emulsion Making, and on the Development of Gelatine Bromide Plates," especially concerning the use of chrome alum, was read by the Hon. Secretary.

The paper opened with a statement that the writer had never, whilst in England, been troubled with frilling, but that since living in Japan he had found plates of his own manufacture, and many others of English make, frill desperately. American made plates, on the other hand, he had found not to frill, and he attributed this difference to the fact that, to stand the heat of the American summer, the plate makers there resorted to means not necessary when working in no hotter climate than England. He therefore concluded that he must put chrome alum into his emulsions, but remembering that his experience with that substance had never been successful, resolved to experiment in order to discover the conditions under which the addition of chrome alum could successfully be made. It occurred to him that failure with chrome alum might be due to free sulphuric acid with which that salt is commonly contaminated. In order to neutralize this acid, he made a 5 per cent. solution of chrome alum, to which he had added liquid ammonia, drop by drop, until a slight amount of permanent precipitate was formed. The solution was, after being allowed time for settlement, decanted, and on being added to an emulsion was found to give a very insoluble film without producing any slowing effect. It had been customary, in giving formulae for the addition of chrome alum to emulsion, to say, "add so much chrome alum to each ounce of the emulsion." This plan did not take into account the varying quantity of gelatine in different emulsions, and the formula ought to read, "take so much chrome alum to so many grains of gelatine in the emulsion." He had found in practice that 1 grain of chrome alum to every 200 grains of gelatine had the effect of raising the melting point of the films about 20° Fahr., and this



was as much as would generally be wanted. As much as 1 grain to 100 might be used without injury to the sensitiveness of the emulsion, and the melting point of the films was then raised by about 50° Fah., which he supposed would be sufficient to enable them to withstand any climate. Of several kinds of gelatine with which he had experimented, the one which answered best when chrome alum was added, was one sold for culinary purposes. There was no maker's name on the packer, but the label was in Freuch. The most remarkable result had been obtained with a gelatine purporting to be Nelson's No. 1. This gave an emulsion containing innumerable particles of absolutely insoluble gelatine, and even when these particles were removed by filtration, the emulsion was quite useless, being insensitive, and refusing to give density of image. With reference to the use of a bath of chrome alum solution previous to development, the most conflicting statements had been made. It had been stated by one experimenter that development was not in any way retarded by this treatment; whilst another stated that development was thereby rendered impossible; and a third said that the chrome alum bath was permissible when it was intended to develop with iron, but not for pyro development. It occurred to the writer that these different results might be attributable to different degrees of acidity in the samples of chrome alum used, and he had therefore experimented with a solution which he knew contained free acid, and with the same solution after being neutralized with ammonia, as mentioned in the earlier part of the paper. Plates that had been exposed in the camera were levelled, and one end was covered with the acid solution, and the other with the neutralized solution of chrome alum, the centre part not being touched. After five minutes they were well washed and developed, one plate with pyro and the other with iron. On the pyro developed plate the chrome alum parts came up more slowly than the central part, and although detail came out eventually, density could not be obtained. With iron development, on the contrary, the development was almost simultaneous on all three divisions of the plate; the advantage, if anything, being with those parts which have been chrome alumed. He had also used chrome alum in the iron developer itself with success, by mixing 5 per cent. with the potassium oxalate solution. A further point connected with emulsion making was one which had been brought forward by A. L. Henderson, namely, that by melting and resetting emulsion several times before coating the plates, the sensitiveness was considerably increased. He had verified this statement by experiment, but had not found any advantage in the addition of small quantities of soluble bromides and nitrates, as recommended by Henderson. Abney, some years since, published a statement that the keeping of emulsion in a cold state resulted in increase of sensitiveness. He, the writer, found that this was not of necessity the case, and attributed the gain in sensitiveness rather to the repeated melting and setting than to mere keeping. He had found that after melting and setting three times, no further gain in sensitiveness resulted from repeating the process, although it might be done many times without injury. Capt. Abney had also described similar experiments, he thought somewhat earlier than Henderson. A further point in emulsion making which Henderson had brought prominently forward was the advantage arising from converting a portion of the nitrate of silver solution into ammonio-nitrate. The writer had found that there was a benefit both in quality and rapidity by adding the ammonio-nitrate portion to the emulsion before adding the remainder. When ammonia was added at the commencement of the emulsion mixing, a greater amount of silver bromide could be formed in a given quantity of gelatine without becoming granular, than could otherwise be done. Using 15 or 20 per cent. excess of soluble bromide, he had found that the bromide from 400 grains of nitrate of silver could be emulsified in the presence of twelve ounces of water; but if there was present a sufficient quantity of ammonia to convert one-fourth of the silver into ammonio-nitrate, 8 ounces of water sufficed for the emulsification.

Discussion being invited, W. E. DEBENHAM said that this paper was good not only in itself as affording information, but that it was an example of what a paper ought to be, showing how facts could be brought to light by properly directed experiments. There was one point upon which he should like to ask the author a question: it was as to the quantity of gelatine used with the 400 grains of silver nitrate in the experiment mentioned at the close of the paper.

Captain ABNEY said that the experiments referred to by Mr. Burton on the increase of sensitiveness were made some five or six years ago. He had great pleasure in listening to the terse

writing of Mr. Burton. As Mr. Debenham said, the way the experiments were described taught others how to experiment themselves.

J. SPILLER said that the paper was not only conclusive in itself, but suggested further experiments. How was the excess of acid in commercial chrome alum to be best got rid of? He suggested that it should be done by adding a solution of acetate of lead; the sulphuric acid would then be replaced by acetic acid, most of which would evaporate in the drying of the plate.

W. F. DONKIN said that another plan for getting rid of the excess of acid would be to precipitate a small portion of the solution with ammonia, then wash the precipitate, and add it to the remainder of the chrome alum solution.

T. SEBASTIAN DAVIS said, with reference to the increase of sensitiveness gained by melting and resetting repeatedly, that in doing this the emulsion was necessarily kept liquid for some time, and he thought the increased sensitiveness might be due rather to this fact, than to the actual melting and setting. He would like to hear the experience of others on this point. He had found it impossible to gain anything like the increase of sensitiveness—three times—by melting and resetting as mentioned by Mr. Burton. As to the acidity of the chrome alum solution, the amount of free acid in the small quantity of chrome alum used was small compared with the acidity commonly found in the quantity of gelatine with which it has to be mixed.

W. ENGLAND had found that he had only gained increased sensitiveness by keeping emulsions when they had been prepared by the ammonia method.

A. COWAN, on the contrary, had found more gain with boiled emulsions, than in those made with ammonio-nitrate.

Capt. ABNEY's experience was similar to that of the last speaker.

J. D. ENGLAND had found increase of sensitiveness to result from keeping four or five hours in the melted state. He added chrome alum just before coating, and commonly coated three or four plates before the addition. He had not found them in any way different as regards immunity from frilling.

W. CORB had noticed that the amount of increased sensitiveness gained by repeated melting and setting depended upon how much the plate had been washed.

W. E. DEBENHAM had found that emulsion gained considerably in sensitiveness by being kept for a few hours just melted. When repeatedly melted and reset, he had found fog more likely to set in. This he attributed to the fact that as he used chrome alum, the temperature for remelting was higher than the emulsion would stand with impunity.

G. L. ADDENBROOKE then read a paper on "A Lens Tube Complete with Iris Diaphragm, and a Combination Set of Lenses for Use in such a Tube," in the course of which he said that one of the greatest difficulties met with was the want of range of size of image unless a large number of lenses were carried about. The iris diaphragm was not new, but for a long time had only been used in microscopic work. It was a matter for surprise that for so long a time opticians had not applied the principle to photographic lenses in place of the cumbersome set of Waterhouse diaphragms, which he thought would, as time went on, be generally superseded by the iris diaphragms. One enterprising firm of opticians had for some little time past fitted their lenses with this arrangement, and others were following suit. As to the use of a combination set of lenses made interchangeable in one mount, and capable of being used one with another as doublets, Darlot had some time since introduced such a set, but whether the optical work was not up to the standard, or from some other cause, they did not seem to be much used. The lenses he (Addenbrooke) used were three symmetrical or rectilinear doublets, one of moderately wide angle, one giving medium sized image, and one rapid longer focus lens. With even such a moderate set of lenses, if used in the ordinary way, there were about thirty-two pieces of apparatus involved, but by using one tube and having the lenses arranged to fit into it, much fewer parts were required. With this set, by using the separate parts as single lenses, and by combining the front of one with the back of another, as well as by using them complete, he obtained a great variety of focal length. Very good definition could be obtained by using one combination belonging to one of the medium focus lenses, with one either from the longest or the shortest focus pair. With one from the longest and one from the shortest the definition was not quite so good, but this was a combination that would not be required, as the medium lens was of about the same length of focus. The lenses were



mounted in cells of such a depth as to place each one at its proper distance from the diaphragm, and the fitting of the cells into the tube, and of the tube into the flange, was accomplished by bayonet joints. By moving the index of the iris diaphragm with which the tube was furnished, any sized opening could be obtained, and the number of the universal standard could be ascertained by referring to a table prepared with regard to the lenses belonging to the set to be used. The best way to work, he thought, was, after focussing, to turn the index of the diaphragm without taking the head from under the focussing cloth until sufficient definition was obtained. The operator could then judge from the brightness of the image what exposure would be required, and he could refer to the index and table for the same purpose. The shutter was the same as that which he had introduced in April 1882, but with some modifications and simplifications which time had naturally suggested. It was constructed to give an exposure of from  $\frac{1}{24}$  of a second to  $2\frac{1}{2}$  seconds, according as the clockwork train was set beforehand. It could be made, however, for longer or shorter exposures if required.

The CHAIRMAN enquired if W. E. Debenham had had experience with interchangeable lenses, and the latter replied that he had not to any extent, but that he could see no reason why the lenses of a combination should necessarily be symmetrical so long as each was placed at a distance from the diaphragm proportionate to its focal length and displacement of image. In fact, there was a well-known and much appreciated wide angle lens in which the difference of focal length of the two components was at least as great as that between the two pairs which might be used on the plan recommended.

W. ENGLAND said that it was very valuable to be able to dispense with some of the number of lenses which had to be taken about when it was desired to be prepared for all kinds of work.

W. BEDFORD thought that G. L. Addenbrooke had hardly done justice to Darlot, perhaps the only optician who had brought forward lenses for use in varying combinations. He had a year ago obtained a set of lenses of Darlot's by which he got seventeen doublet combinations besides the use of the lenses as single ones, and he was pleased with their work.

G. L. ADDENBROOKE, in replying, said that he really had no claim to the introduction of combination lenses. They had originated with Darlot, but for some reason or other had not come into general use.

Thanks of the meeting were awarded to W. K. Burton and G. L. Addenbrooke for their papers, and it was announced that the next technical meeting would take place on the 24th inst., and the next ordinary meeting on May 8th, when a paper would be read by Sir Howard Grubb, on a telescope for stellar photography, and another by Sir David Salomons.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE usual weekly meeting was held on the 12th inst., A. HADDON presiding.

P. EVERITT exhibited a couple of prints from a Vergara film printed from both sides of the negative.

D. O. DEWEY had also taken two prints from the Vergara film negative, developed at the previous meeting by J. Adams; the difference in each case between the prints was scarcely appreciable.

J. SPURGE passed round one of his sensitometers, promising at an early date that he would read a paper on the subject before the Society.

A question from the box was read:—"A negative was left in the developer and forgotten; it is immensely dense—what is the best method to adopt to save it?"

J. SPURGE suggested bleaching with mercuric chloride.

A. COWAN thought the application of ferricyanide and hypo would sufficiently reduce the density.

A. MACKIE remarked that the negative was liable to become stained with the use of this reducer. He recommended E. Dunmore's plan, to reduce the image until the shadows became quite clear, then to follow with intensification. He had found that when operations with ferricyanide were conducted in the dark, the tendency to stain was much lessened.

The CHAIRMAN exhibited an Eastman film stripper; the paper support from which it had been stripped was also shown. As a curious phenomenon presented itself, the film had formed the first portion of a spool, and the paper support was found to be slightly discoloured to the extent of the circumference of the spool except across the centre, where it had been protected by a narrow band of paper wound round the spool to keep it fastened.

Upon the discoloured parts of the paper a feeble positive image could be traced. The Chairman considered it was due to bromide of silver having passed through the soluble gelatine, and then being absorbed by the paper.

The question, however, why the image was only discernible on the discoloured parts of the paper, while causing some discussion, did not result in eliciting any definite reason for this.

F. A. BRIDGE said one of the uses claimed for transferotype was that it could be transferred on to blocks of wood for engraving purposes. He had recently transferred a film to a block of wood and sent it to an engraver, who subsequently returned it, being unable to work it. He (F. A. Bridge) then rubbed the film down almost to the wood, but the engraver was still unable to work it.

A. COWAN thought the bitumen process might be employed for this purpose, all the film except the image being dissolved away.

The CHAIRMAN said a process partaking more of the nature of a stain was required.

J. SPURGE suggested focussing the image on to the block; the objection to this plan being that an engraver requires to shift the block during the cutting.

H. C. TRINKS remarked that the image, left after stripping, on the paper the Chairman had exhibited, might form the germ of a process for wood-engraving.

The remainder of the evening was occupied in a discussion in reference to a letter received from the Camera Club, relating to photographic exhibitions.

#### DERBY PHOTOGRAPHIC SOCIETY.

THE monthly meeting was held on the 10th inst., Mr. COPE in the chair.

Mr. LOVEJOY (Hon. Sec.) then explained the working of the James lamp, which he said should be placed about 6 feet from the floor, 5 feet from the sitter, and the sitter 5 feet from the background. Mr. James employed a lantern with glass front and chimney, so that the fumes from the magnesium might be conducted through a window, and leave no fumes in the room. Nothing was burned in the lamp but magnesium powder.

The CHAIRMAN passed around a number of photographs taken with the lamp. The lamp being fixed, two groups of the members present were taken by Mr. Lovejoy, assisted by Mr. Bowdin. Mr. Scotton also took one by the James' light, and one by means of a mixture of chlorate of potash and magnesium powder. The plates were developed in the room, and turned out very good.

In the discussion which followed, the CHAIRMAN thought the experiment, as a first attempt, had been very successful, but once using was hardly a fair trial. He thought the lamp, though nicely designed, struck him as being wasteful of magnesium, as it did not appear to consume the entire charge.

The SECRETARY proposed that the question of out-door meetings be discussed. As was decided at the last meeting, the first trip was fixed to Duffield, on the 23th inst. It was arranged that the second out-door meeting be held at Repton, on May 12th, and the third at Cromford and Matlock, on May 26th. Four new members were elected.

#### PHOTOGRAPHIC SECTION OF THE AMERICAN INSTITUTE, N.Y.

At the regular meeting on April 3rd, Secretary O. G. MASON illustrated by lantern views a new combination camera which he had invented, based on the principle of the interchangeability of parts. It was specially designed for copying, making transparencies, and for microscopic work. The main body consisted of a board about 5 feet long by a foot wide, having a slot lengthwise. On to this could be quickly clamped frames to hold negatives, plate-holders, lens boards, and bellows frames. A special device consisted of a bar of wood fastened into the window frame, supporting a wood roller on which were two pins, to which the base-board was attached. At the rear end of the board was an adjustable supporting leg, something like that of a tripod. By means of these two devices (the roller at the front and the adjustable leg at the back) the board could be rigidly held at any vertical angle it might be desirable to place it for copying purposes. The several parts of the apparatus, when shown in one picture, made it appear to be more complicated than it really was. The idea of the inventor to economize by making one apparatus answer for three or four different purposes is a worthy one.

Another gentleman exhibited a new form of a magnesium flash-lamp, which appeared to be rather slow in operation and some-



what clumsy. He had a metal pan 8 inches long by 5 wide, having in one end a small hole half an inch in diameter. The pan was attached to a piston of a pneumatic pump underneath. A lamp was placed in front of one end of the pan. The powder, with a fuse of gun-cotton leading to the small hole, is placed on the pan. When the pneumatic bulb is compressed, it moves the entire pan forward until the hole comes over the flame of the lamp, when the cotton above being ignited, at once produces the flash. An appreciable amount of time is thus required to set it off. Some very good specimen photographs were passed around.

President NEWTON made some remarks on developers for lantern slides, and at the suggestion of Mr. Estabrook had tried lime-water as an alkali, instead of potash and soda. Both of the latter, he remarked, would more or less stain the film, but lime-water did not, and he had had excellent success with it. The formula he recommended is as follows:—

Limewater	...	...	...	1 ounce
Sulphite sodium crystals	...	...	...	20 grains
Hydrokinone	...	...	...	5 grains.

The above will keep clear for three or four weeks. It will make excellent negatives, and if diluted with water will answer for lantern slides.

Secretary MASON explained the method by which Muybridge photographed a revolving disk, and how he proved that the exposure could not have been less than the one-sixth thousandth part of a second. Then with the lantern A. D. Fisk projected on the wall a number of interesting views of horses trotting, birds flying, men running and wrestling (the latter being specially remarkable), and a little girl running to give her mother a bouquet of flowers and kissing her, also of a lady dancing; all being made with Muybridge's apparatus. The pictures of the horse showed that his legs must move faster than his body. There were also views of the expensive apparatus for setting off the batteries of expositors in front of the camera. Mr. Mason stated that the University of Pennsylvania had expended \$30,000 in making these experiments.

Mr. Fisk exhibited slides from the same negative made by contact on gelatine plates, and in the camera by the wet process. In all cases the latter was the best; he could not explain why, unless it was that the surfaces of the glass did not come together in absolute contact.

#### LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.

A REGULAR meeting was held in the Mayor's Parlor, Old Town Hall, on Wednesday, 11th inst., GEO. BANKART in the chair.

Mr. WILKINSON gave a demonstration on "Photo-mechanical Printing." Starting with a short *resumé* of the details of the various processes, he developed some pictures in chromatized gelatine, the inking up of which, and gradual development of contrast, being quite a new experience to the members, was eagerly followed, and as the reason for such particular operation was given, the interest was maintained until the end. Mr. Wilkinson also practically demonstrated the process of printing on zinc in bitumen, developing the already exposed negative in a bath of turpentine.

The evening being far advanced, the promised initiation into the mysteries of collotype was postponed until another meeting.

#### MANCHESTER AMATEUR PHOTOGRAPHIC SOCIETY.

THE monthly meeting was held on Tuesday evening at the Manchester Athenæum, S. F. FOWLER in the chair. The following gentlemen were elected members:—Thomas Beeston, John Brown, Henry Child, S. H. Crompton, J. H. Huxtable, C. F. Kerr, John Kerr, Samuel Leech, Henry Littlewood, R. M'Dougall, John Spurge, jun., W. F. Whalley, and H. G. Williams, jun.

The following objects were laid upon the tables for the inspection of members:—Samples of Lund's snowdrift opals; Wormald's exposure index; groups taken with the flash light at the last meeting; and examples of prints by the Honorary Secretary from one negative on matt surface, ordinary, albumenized, and gelatino-emulsion papers.

A presentation to the Honorary Secretary, F. W. Parrott, of a beautifully illuminated address and a purse containing twenty-five sovereigns, was made on behalf of the members by the Rev. H. V. Macdonald, M.A., who considered that the success of the Society had been materially aided by the courteous manner in which Mr. Parrott had done his work. He alluded to the rapid

growth of the Society, which now numbered 260 members, with every prospect of a continued increase, and believed it was the largest amateur photographic society in England at the present time.

Mr. PARROTT, in accepting the gift, said he had been taken by surprise, never expecting to receive any material recognition of his services. He had certainly spent a considerable amount of time on the Society's affairs, but it had been a labour of love throughout. He did not attribute the success of the Society to his exertions, but to the hearty interest which the council and members in general had taken in its prosperity.

John Bathe gave a lantern exhibition of about 170 slides, the work of the following members:—Messrs. Bartleman, Crippin, Dalton, Davenport, Davies, Flower, Greenwood, Holt, Jackson, J. G. Jones, Lees, Parrott, Russell, Shirley, Smith, Stanley, Steventon, Wade, Wildop, and Wolff. The first slide passed through the lantern had been taken from the illuminated address previously presented to the Honorary Secretary, and was received with applause. Among the slides were several taken from negatives of groups taken at the previous monthly meeting by the flash light.

The address presented to the Honorary Secretary was designed and illuminated by Mr. J. S. Watson, a member of the Society. The design embraces special references to photography, and was much admired as a specimen of art.

#### CAMERA CLUB.

THE subject on April 12th was "Making Lantern Slides," the preparation of wet collodion slides being described and demonstrated by Mr. Gale, and collodion-bromide by Mr. Hussey. Lyonel Clark occupied the chair.

The proceedings opened by the reading of a paper by Mr. Davison on the general subject, and the demonstration by Messrs. Gale and Hussey followed. J. D. England then developed some rapid chloride plates, and Mr. Jackson described the process of transferotype.

After some discussion, the lantern was put on and examples of all the processes were shown as follows:—Woodbury slides lent by the Woodbury Printing Company; wet collodion, by Mr. Gale; collodio-bromide, by Messrs. Mawson and Swan, Mr. Hussey, and Mr. Brooks; gelatino-chloride by Mr. Cowan, Mr. England, and Mr. Hepworth; gelatino-bromide, by Messrs. Mawson and Swan, Fry, Norgrove, and Wainwright; albumen slides and Notman's wet collodion slides lent by Major Nott, and transferotype slides by Mr. Jackson. A series by Mr. Dresser was also shown, illustrating the effects produced by different developers. Apparatus was also shown by Messrs. Shew, Houghton, Marion, and the Scepticon Company.

The subject on Thursday, April 26th, is "Platinotype Printing," when a demonstration in the ordinary process will be given by Mr. Willis. On May 3rd, Mr. Willis will also give a demonstration of the new cold platinotype process.

#### BURY PHOTOGRAPHIC AND ARTS CLUB.

THE annual exhibition of the works of the members of this Club, being the seventh of which has been held, was opened on April 3rd, in the Athenæum. A great advance on previous years has been made in the number of pictures contributed, and also in the character of the works themselves; the increase numbering about sixty, whilst the photographs are of larger size than any shown at previous exhibitions. Some of the enlargements, indeed, make notable pictures, especially those by R. Grundy, jun., H. M. Dearden, and C. H. Openshaw. A new feature is the large number of oil paintings and water-colour drawings which have been contributed.

Coming to the photographs, C. H. Openshaw has seven enlarged pictures 15 inches by 12 inches. The enlargements have been made by Messrs. Samuel Fry and Co., of Kingston-on-Thames, from negatives taken by Mr. Openshaw. There are two sea pieces with photograph of a boat in full sail, called the "Six Sisters," from which the pictures take their names. These copies are taken from instantaneous photographs. The "Critic" is a photograph of a countryman sitting on a bank and watching an artist who is busily engaged in painting a landscape. The others are excellent views of Carnarvon Castle, a Lock on the Peak Forest Canal, and two of the last exhibition of the Club at the Athenæum. Mr. Grundy has this year gone in for enlargements, only in his case he has done the whole of the work himself, and has produced some interesting pictures. These



have been printed on Morgan and Kidd's paper, the size being 23 inches by 17 inches. They consist of views of Haddon Hall, of scenery on the Dart, an excellent photograph of Carnarvon Castle from a different point to that taken by Mr. Openshaw. He has two views 15 inches by 12 inches of Park Hills. J. D. Mould contributes some admirable architectural drawings. A series of pictographs or rock sculptures have been photographed by Alexander Taylor, who has also a number of miscellaneous views. W. Spencer, a young member of the Club, exhibits nine cabinets of local scenery, as well as views of the Isle of Man and at Rivington, in which he has done some highly creditable work. F. W. Livsey's contribution includes sixteen views about Bala, North Wales. One notable photograph in his collection is a winter scene in that district; the ground is covered with snow, and the trees are bending under the weight of their icy clothing. The sky effects are admirable, and notwithstanding the difficulty of the subject Mr. Livsey has succeeded in producing a capital picture. H. M. Dearden is also another member who has gone in for large sized photographs, 23in. by 17in. These are argentic bromide enlargements, and are really fine prints. "View on the River at Summerseat" is a really beautiful photograph, and is equal to any in the room. The others, which are of great merit, are views of Carnarvon Docks, Chesham Green, Fountains Abbey, Ripon Cathedral, Old Blackford Bridge, and Old Hodder Bridge; he also has on exhibition nine silver prints of local scenery. His son, H. Dearden, exhibits four very good silver prints of machinery, &c. A number of excellent prints by the platinotype process have been contributed by E. W. Mellor. These are principally scenes in Scotland, and he has twelve pictures of Yorkshire scenery on Obernetter paper, and several bromide enlargements of views of Whitewell, &c. W. S. Barlow has a keen eye for bits of natural beauty, with the ability to produce them on canvas or by means of the camera, and in this section he has six photographs, 10in. by 8in., of pretty scenes in the locality, such as Carr Wood and Bolton Woods, &c. F. Cooper, whose contributions to previous exhibitions have been greatly admired, has maintained his reputation by his five photographs of local and Welsh scenery. J. Taylor, a previous exhibitor, has also done some good work this year, but his nine pictures, 10in. by 8in., are exclusively reproductions of scenes in Wales. A. Crompton exhibits a case of nine cabinet pictures of local scenery, interiors, &c. T. Dearden has principally devoted himself to photographing Welsh landscapes, and he sends nine cabinets printed on Obernetter paper.

On Saturday evening, April 7, E. W. MELLOR gave a lecture on Windsor Castle, illustrated by a splendid series of photographic views, which were very much enjoyed by the audience assembled.

## Talk in the Studio.

**NORTH STAFFORDSHIRE AMATEUR PHOTOGRAPHIC ASSOCIATION.**—A meeting was held on Wednesday, 11th inst., under the presidency of C. Alfieri. The Honorary Secretary exhibited a magnesium flash-lamp, and a number of members having placed their cameras in readiness, several exposures of plates were made by light of the lamp, and the negatives developed in the room.

**THE LIVERPOOL EXHIBITION.**—According to the *Liverpool Courier*, there is sufficient surplus of funds for this exhibition to go far towards the establishment of a Photographic Club House for Liverpool.

**FLUORESCENCE AND PHOSPHORESCENCE.**—Prof. E. Wiedemann has made a new study of these phenomena. He proposes the general name *luminescence* for evolutions of light which do not depend on the temperature of the substance concerned. Fluorescence and phosphorescence he groups together as photo-luminescence, the light occasioned by electric discharges he names electro-luminescence, that appearing in chemical processes he terms chemo-luminescence; the light which appears on gently heating fluor-spar is thermo-luminescence, and that developed by friction and crystallisation is respectively tribo-luminescence and crystallo-luminescence.—*Scientific News*.

**PHOTOGRAPHIC CLUB.**—The meeting on April 25th will be a Lantern night; discussion on "Lantern" matters.

## To Correspondents.

\* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

**STOKE-ON-TRENT.**—1. The selling of such bichromated films ready sensitised is hardly practicable, as the gelatine has a constant tendency to become insoluble under the action of the bichromate, even when light is excluded. 2. If the films are thick, the tendency to become insoluble during the time of drying is so great as to introduce some uncertainty.

**B. LATHRAM.**—Not unless the sitter gives his written consent.

**A. MORRISON.**—1. Ten grains will be sufficient. 2. No.

**W. B.**—See the formula on page 201 of the YEAR-BOOK for 1888. "C," stands—

Gelatine	...	...	...	...	45 grains
Ammonium chloride	...	...	...	...	6½ "
Water	...	...	...	...	1½ ounces

**GEORGE WATIES.**—The whole affair is a disgraceful swindle, and we have said so. Of course the Stock Broking sharks only expect to hook persons who know nothing of photography.

**W. EXCELL.**—Probably you use a paper which is hard-sized and very smooth on the surface. Try a paper having about the same texture as that upon which the PHOTOGRAPHIC NEWS is printed. It sometimes happens that what you describe happens through the use of too stiff an ink. Ordinary paraffin oil can be used for thinning, and a very minute trace of ink serves for transfer to the stone.

**A. WHITHAM.**—Thank you for your remarks, all of which are quite true. The writer put this forward as a suggestion, not as a finished process. We will say more on the point before long.

**B. LANDOLT.**—1. The iron would not be precipitated under such circumstances, the organic matter referred to serving to keep it in solution. 2. There is evidently some ground for doubting; but the matter should be cleared up before long. 3. We prefer to use acetic acid, as but little remains in the film after drying. 4. Saxe paper answers very well, but if you do much work of this kind, it will be worth while to look out for a cheaper quality. What you want is a paper which is well made as regards structure (freedom from knotty particles, uniformity of texture, &c.); not necessarily a paper made of expensive materials.

**M. PAGE.**—Write to the person whom you name; his address being in the list of members of the Photographic Society.

**CHARLES PARSONS.**—Next week.

## Photographs Registered.

Mr. R. W. ROBINSON (Redhill)—Photo. of a Child Asleep.  
Mr. E. G. DOWN (Bournemouth)—Photo. of Rev. W. De Veer.  
Messrs. JACKSON BROS. (Middleton Junction)—Photo. entitled "A Three-legged Race," photo. entitled "Hopping over Caps."  
Mr. S. V. WHITE (Reading)—Photo. of Rev. G. Ibbsom Tubbs.  
Messrs. SMITH AND ASHMAN (Huddersfield)—Photo. of Huddersfield Football Team.  
Mr. C. R. TACKMAN (Shrewsbury)—Photo. of Archdeacon Lloyd.  
Mr. H. W. MACDONALD (Eton)—Photo. of J. L. Sullivan.  
Mr. GUTTENBERG (Manchester)—4 Photos. of Chesters Thompson, J.P.  
Mr. E. HARNETT (Harrow)—Photo. of Garibaldi.

## The Photographic News.

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# THE PHOTOGRAPHIC NEWS.

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### COMPOSITE PORTRAITURE.

#### A COMMUNICATION FROM FRANCIS GALTON.

THOSE who believe that the hope of producing real and true portraits by photography rests in Galton's method of composite portraiture, will welcome the subjoined communication from that investigator—a communication which is important as distinctly formulating a defect in the older method of working, where undue emphasis was placed on conformity in a single respect. In scientific matters, to distinctly formulate a need is often to find a means, and let us hope it will be so in the present instance.

In the following communication we have a distinct statement of what it is needed to do, and a suggestion towards the doing. Will our readers exercise their minds as to the problem?

Here is the text of Mr. Galton's communication:—

"I receive from time to time beautiful composite photographs made in America, and have not unfrequently received letters asking about possible or actual improvements in the process. In reply, I should like to be permitted the use of your columns to make a few remarks on the subject.

"A composite portrait is not the *mean* of its components, but an *aggregate* of them, which is reduced in intensity of tint to that of one of the components. If it were a mean, its outlines would be sharp, but being an aggregate; they are not, only those shades or lines that are common to all the components are as intense, or as well defined, as they would be in an ordinary portrait, while ghosts and shades of other lines are distributed variously about. These ghosts are often too conspicuous. Those that affect the features are especially due either to differences in the relative breadth and width of the component faces, or to a want of symmetry in some of them which causes the straight line that passes as nearly as may be along the eyebrows to be inclined to that which passes between the lips. In the composites I have thus far made, I have merely attended to keeping the vertical distance between the eyes and the parting of the lips at exactly the same length in all cases, and to making the best fit of the remainder that each case severally admitted. It strikes me now that it would be well worth while to vary the whole procedure by attempting to approximate to a mean result, and in the following way. First, find by measuring the portraits about to be combined, the proportion that the distance between the pupils bears on the average of all of them to the vertical distance between the pupils of the eyes and the parting of the lips; then optically transform every component portrait into that same average proportion. Secondly, straighten every face that is asymmetrical in the way above described, into a symmetrical one. Lastly, make the composite from the transformed portraits.

"I suspect that a pinhole camera would be found perfectly

suited for effecting these transformations, if the component portraits were not too small. A portrait of sufficient size could, by a single operation, be reduced by its means to any desired scale, both in breadth and in width, independently of each other, namely, by the ingenious device I saw lately in your columns, but cannot specify where, of replacing the pinhole by a vertical slit in one moveable diaphragm, and an horizontal slit in another. The asymmetry could at the same time be remedied by so inclining the portrait to the optical axis of the camera as to foreshorten the side that was too long. Foreshortening is accompanied by no blur of image in a pinhole camera.

The sliding adjustments of the camera would have to be graduated, and each portrait measured carefully by laying a glass scale upon it, and using a low power lens. After this had been done, a table calculated once for all for the camera would tell at what graduations of distance and of inclination the portrait should be set, in order to obtain the desired result.

"The transformations I propose are small in amount. They are always made, and we unconsciously witness them, whenever the person at whom we are looking holds his face a little inclined from a full-face view. But, small as they are, I think they are worth making. I have not now got my photographic things in working order, and am busied in other ways, so I speak for the most part theoretically; but not wholly so, as I have made some optical experiments which corroborate, so far as they go, the feasibility and advantage of what has just been said."

We will forward any letter intended for Mr. Galton.

### MORE FROM DR. PIFFARD ON THE MAGNESIUM LIGHT.

THE flash light in the form introduced by Dr. Piffard has, in the course of a few months, become almost a recognised thing in the studio of every portrait photographer who makes a point of keeping well up to the times, and hundreds of workers have devised new arrangements in connection with the flash light; hence a further communication from Dr. Piffard carries with it considerable interest.

The following is from *Anthony's Bulletin*:—

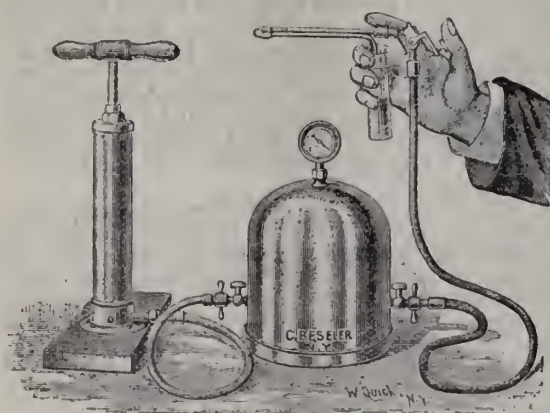
The past six months have witnessed a remarkable development in the use of artificial illumination for photographic purposes. The Gädicke powder and its various modifications and imitations, the writer's gun-cotton method, and the photogenic pistol cartridge, are the principal methods, that have been employed. Recently, Mr. Armstrong, in England, proposed to blow pure magnesium through an alcohol flame, and carried out his plan by using an ordinary powder blower with a rubber bulb attachment. By quickly compressing the bulb a fine jet of magnesium



powder was projected against the flame, the heat of which caused its ignition. By this means he was able to obtain a single brief flash of great intensity, often quite sufficient for the purpose. It occurred to the writer, however, that this method could be considerably improved by employing a reservoir of compressed air in connection with the receptacle which contained the powder. The tube connecting the air reservoir with the powder receptacle should have a quickly acting valve or cut-off. To compress the air in the reservoir it is necessary to have a small compressing pump. With these means one can always keep on tap a sufficient quantity of compressed air and magnesium powder. The apparatus, including pump, copper cylinder for holding the compressed air, and the holder for the powder, with the necessary tubes, &c., are regular articles of commerce, and can be obtained without difficulty at a cost of from about thirty dollars upward. The alcohol lamp which I find best adapted to the purpose consists of a small brass box, three inches long, one inch and a half wide, and an inch deep. This is packed with asbestos or mineral wool confined in place with fine gauze. The box should have a cover. When wanted for use the wool is saturated with alcohol and lighted, and the magnesium powder is blown through, giving an intensely brilliant actinic light, the duration of which can be regulated at will.

If compressed oxygen, instead of air, is used, the effect is still more striking. The oxygen can be obtained, ready compressed, in large cylinders, such as are used in connection with the oxy-hydrogen lime light.

The accompanying illustration exhibits the general



arrangement of the apparatus, except that the terminal spray tubes for atomizing liquids are removed, and a powder-blower substituted.

The novelty of this method of producing the magnesium flash-light consists in the use of a reservoir of compressed air or oxygen, in connection with a suitable stop-cock or cut-off, and the requisite tubes and connection, together with an alcohol or other suitable flame for igniting the magnesium.

## THE PHOTOGRAPHIC EXHIBITION AT GLOUCESTER.

### SECOND NOTICE.

In addition to the awards announced last week, we have to refer to the following:—Certificate to B. G. Wilkinson, jun.; silver medal (apparatus), Edward Marlow; bronze medal (apparatus), H. Park. In addition to W. W. Winter's medal picture, and Dada's "Tiek-Tiek," there is a frame of children's portraits (13). The panel portraits by Gunn and Stewart are good examples of platinum for portraiture, as is also the frame of three panels by W. Gillard. The work of Mrs. Brian Hodgson

deserves praise, several of the pictures suggesting the work of the late Mrs. Cameron, particularly the portrait of a lady (18), and a group of children in another part of the room.

W. Adeock sends a number of his admirable pictures, but most of them have already been noticed in these pages.

J. P. Gibson's landscapes are always distinguished by excellent qualities, and it is a charming picture made up of slender materials, only a pebbly brook and children in the foreground, but enough to make a landscape worthy of a medal.

H. Tolley has sent a number of landscapes, all of which are good. "The Lonely Shore" is too well known to call for remark, but several are new, and the winter scenes are admirable.

Of the Rev. H. B. Hare's landscapes, perhaps the best is "Thirsty Moments," a very fine study of cattle.

H. Manfield had fine material in his Brittany views, and has made the best of it. The fine old street corner is like a monochrome by Prout, for the light and shade is so broad and effective.

C. Smerdon Roe's "Water Party" is a very successful picture of an old ferry boat and its passengers. It is natural in treatment and effective in light and shade. The sunny-faced girl, charming in pose, and most striking in light and shade—for she is in a full blaze of sunlight—is a most successful attempt at a difficult subject by Paul Lange; and the same may be said of "Keep the ball rolling, boys," a stirring picture of the making of an immense snowball, and its dark, tortuous track is well shown in contrast against the surrounding whiteness. Martin J. Harding's series on bromide paper are extremely good in colour, and compare favourably with platinum. There are some very fine interiors by R. Keene, J. H. Hogg, and H. Manfield.

Ralph W. Robinson has produced a fine picture in his "Snow Hoar-Frost and Mist," and the yachting studies of W. C. Beetham are good examples of enlargements, well within the means of the amateur. Mr. F. H. Burr has also produced an extremely good enlargement in his "On the Wye, Ross." The reflections and shadows on the water are very picturesque, and the boys bathing give life to the scene.

There is a large show of lantern slides, both amateur and professional; and as far as could be judged by the very imperfect lighting possible under the circumstances, many of them were very fine; but in order to judge fairly of their qualities as slides, projection on the screen is absolutely necessary. There was also a large show of apparatus, but we did not see any novelties to call for special mention.

## Reviews.

ELEMENTARY LESSONS ON SILVER PRINTING. By W. M. Ashman. Revised and reprinted from the PHOTOGRAPHIC NEWS, with additions to date. (London: 1888. Piper and Carter, 5, Farnival Street, Holborn, E.C.) Paper covers, 123 pages, price 1s. 6d.

So much appreciated were the articles on Silver Printing, contributed by W. M. Ashman to the PHOTOGRAPHIC NEWS, that they have several times been reprinted in foreign periodicals; and also abroad, in book form. The experience of many photographers has proved how thoroughly trustworthy these articles were as a guide to every-day work in the printing room.

Indeed, we may emphatically say, that the book before us is one which photographers may thoroughly depend upon as an every-day guide in relation to silver printing, and another good point about it is that the whole of it is useful and to the point; undiluted, in fact, with any personal fads of the author,



## NOTES FROM NEW YORK.

ANNUAL MEETING OF THE NEW YORK AMATEUR SOCIETY—  
MOVING A LARGE HOTEL.

At the annual meeting of the Society of Amateur Photographers, held at 122, West 36 Street, New York, on Tuesday evening, April 10th, President Walker read an important opinion as to the matter of what constitutes a quorum when the number is not specified in the constitution, as happens to be the case in the present constitution. The substance of the opinion was that for societies organized under the laws of 1875, in the State of New York, any number of members attending any regular or special meeting would be a quorum, as there was no particular statute relative to it; it simply rested on the common law. Several decisions to sustain the opinion were cited.

In view of this Mr. Beach enquired if 10 members out of 250 only were present, whether a majority of them would be sufficient to legally transact business. The President replied that their vote and decision would be as binding as if a larger number were present.

Fortunately the roll-call showed thirty-one active members as being present, enough to make the quorum necessary for business at the annual meeting. The reports of the officers were next read, that of the President coming first, which, though somewhat lengthy, was quite interesting.

He congratulated the Society on its prosperous condition, dwelt at some length on the value of the lantern exhibitions given during the year, showing what good they had done in awakening an interest in photography and in inducing many to join the Society; spoke of the several successful illustrated lectures given by different members, mentioning Lieut. Howell's account of China and Corea, Mr. Leaming's trip to Venezuela, and Mr. George Marshall Allen's California and Alaska trips. The interchange of slides with the London Camera Club had been conducted very satisfactorily, and was a decided success. All of the work of showing the 2,000 lantern slides exhibited during the year had been carried on by the Lantern Slide Committee, and they were entitled to the thanks of the Society. He referred to the formation of an interchange of societies for exchanging lantern slides, as proposed by the Exchange Conference held in Philadelphia in February, and recommended that the Society enter into it. But each society should not be required to show all of the lantern slides sent to it; it should have the right to discriminate, and only show those worthy of merit. He spoke of the donation of seventy slides to the Society by Mr. C. D. Irwin, of Chicago; also of several presented by Mr. Leaming. During the year there had been shown by demonstration the working of the stripping film, and a paper read by Dr. H. G. Piffard, on a "New Magnesium Flash-Light," which was at once taken up by Mr. Rockwood. Since then a multitude of flash powders had appeared. Another improvement was the use of hydrokinone as developer, in place of iron, for the development of lantern slides and transparencies. This agent had long been known in England, but until recently had been but little used here.

There had also been several improvements in detective cameras whereby they were made cheaper. The size most used was 4 by 5. In printing papers, one of the simplest and easiest to work was the chloro-bromide paper. The simple platinotype process had lately been improved by Mr. Willis. He recommended the adoption by the Society of the metric system, and that manufacturers of plates adopt some uniform method of marking the sensitometer number on the packages. The value of orthochromatic plates was alluded to, and he advised members to try them. A special drying-box for drying bath orthochromatic plates had been presented by Mr. Geo. H. Ripley. He regarded the former work done by the Society in trying to get manufacturers to overcome the difficulty in matt markings on plates as very important; considerable progress had

been made in this direction, but it was necessary to be alert, and urge manufacturers to use all possible means to prevent the markings. They had thus far tried to satisfy the consumers.

Referring to the changes in the financial policy of the Society, he stated that it was thought advisable to advance the dues to \$16, and set aside one-fourth of them as a sinking fund. If the raise was generally supported, as he expected it would be, there should be a reserve of \$1000 at the end of the next fiscal year. The membership certificates, issued three years ago, he regarded as a useless piece of red tape; they conveyed no right to any property in the Society, and were really worth nothing. When they were issued, those taken in excess of one by members were to be redeemed at some future time as the membership increased, and were in the nature of a loan, which should be held as a moral debt, and should be paid, unless the holder of the extra certificates desired to present them to the Society. As was well known, the certificates had been dispensed with. He referred to the increased use and value of photography in astronomy, how it had brought to light stars not seen with the naked eye. In closing, he thanked the members for the great kindness and consideration that had been shown him during his term of office, and mentioned that the Society had lost two members by death during the year, Mr. Joseph H. Drexel, and Mr. C. Smith Lee, who was on the yacht *Cyenthea*, which is supposed to have been lost in a hurricane. The report was received with considerable applause, and ordered to be filed.

The Treasurer's report, by Mr. Richard H. Lawrence, was next presented by Mr. James Stebbins, junr. The total receipts and expenses for the year reached very nearly \$5000, the balance on hand April 1st, being \$98. The principal items in the receipts were, \$3137 for dues and membership fees, \$295 for rent of lockers, \$789 for photographic printing, and \$269 for miscellaneous donations. Among the items of expenses were \$900 for rent, \$946 for salary to printer and janitor, \$516 for improvements, \$216 for apparatus, \$121 for lantern exhibitions, and \$50 for a printing press.

In commenting upon this report, it will be observed that the showing is not as favourable as that of the previous year, since the extravagant expenses for salaries (out of all proportion to the income of the Society) would have caused a heavy deficit had not the membership rapidly increased. Notwithstanding the increased revenues both in dues and locker rent, and the advantage of lower expenses for permanent improvements than formerly, the large surplus that might have been saved had been lost, leaving a balance on hand, April 1st, of about one hundred and sixty dollars less than that of the 1st of April, 1887.

Secretary Granger then read his report, remarking upon the cordial relations held by this Society with all others in this country, how he had assisted in organizing new societies and clubs, and noting the fact that there still appears to be a great and growing interest in the subject of amateur photography. The increase in the membership during the year had been eighty-five. The present membership was divided as follows:—Active, 211; Subscribing, 12; Corresponding, 31; Honorary, 5: 260 in all.

Following this was the Librarian's report, showing that most of the books donated during the year were given by F. C. Beach, R. H. Lawrence, and H. M. Grisdale. The several publishers had contributed their current journals gratuitously, which were kept regularly on file. Anthony and Co. had furnished the printed proceedings of the Society as heretofore, and all were recommended to have a special vote of thanks, which was accorded later on in the meeting. Two albums had been presented by Mr. Daniel P. Read, and one by Mr. C. C. Roumage, Junr. Mr. Read had also presented two lenses.

The election of new officers then took place, Messrs. Sydney Bishop and George R. Allertou acting as tellers. To make the matter short, and as there was no opposition, Secretary Granger was authorized to cast one ballot for



the Society. The following persons were then declared elected as officers and directors:—C. W. Canfield, President; H. J. Newton, Vice-President; Clarence S. McKune, Secretary; C. C. Roumage, junr., Treasurer; H. G. Piffard, M.D., James H. Stebbins, junr., J. Howard Wainwright, Geo. P. Rowell, David Williams, Cornelius Van Brunt, H. T. Duffield, Chas Simpson, Directors.

Ex-President Walker introduced President Canfield in a few happy remarks, hoping the Society would give him its full and earnest support. President Canfield replied briefly, and took the chair.

Some discussion ensued as to the appointing of a special committee on the revision of the constitution, which was deferred for one month. Mr. Beach offered a resolution of thanks to Ex-President Walker for his faithfulness in looking after the affairs of the Society, which was unanimously adopted. A special vote of thanks was next accorded to the various Treasurers who had served during the year, and to Secretary Granger, and C. C. Roumage, junr.

An improved method of burning magnesium powder was then exhibited by Dr. H. G. Piffard, which he claimed was an improvement over Mr. Armstrong's plan.\* On a table was put a plate holding alcohol, which, when lighted, produced a large blue flame. A reservoir of compressed air or oxygen gas at about 30 lbs. pressure was connected by a rubber tube to a small bottle about an inch in diameter, and six inches long. A special spring faucet was provided on the pipe entering the bottle. A second pipe running from the bottom was bent at right angles at the top, terminating in a point like a blow-pipe jet; the magnesium was put in the bottom, about three drachms. When the spring faucet was pressed with the thumb, the air or gas pressing on the powder forced it out of the bottle continuously and rapidly. Impinging with the alcohol flame a very large brilliant flash of light was obtained. Experimentally, two flashes were made with perfect success, and the Doctor's plan was highly applauded, since it was simple, perfectly safe, and more effective than the air bulb method.

Mr. Beach exhibited an improved universal ball-and-socket joint intended to be secured to the top of an ordinary camera stand. The joint supported a second wood tripod head, to which was clamped the camera. A hollow metal ball, about one-and-a-quarter inches in diameter, is fastened to the under side of the second triangular tripod head, and is held between three metal fingers, which act as sockets to hold the hollow ball. Feet project from the base of the fingers, and are screwed fast to the top of the tripod head. A central clamp screw passes up through the hole in the centre of the tripod head into the base of the metal fingers, and acts upon a loose washer or round plate set in the base of the finger socket. Supposing it is desired to tilt the camera to a great extent, as might be required in looking down a ravine, or up a high mountain, we simply loosen the clamp screw, which, in turn, releases the pressure of the round plate on the hollow ball. Then the camera may be turned or tilted in any position, and, on tightening, the clamp screw be rigidly held there. The inventor, Mr. J. E. Dauchy, of West Winsted, Conn., sent the model to Mr. Beach, stating that he had used it with considerable success; it was intended for 5 by 8 cameras.

Mr. Beach regarded it as a very simple and effective invention. It is of special use where it is difficult to place tripod legs so that the head of the tripod will stand level.

Mr. Apgar thought he had seen a similar invention in Mr. Prosch's shop. One member said it would have been a very useful device to him in photographing deep canyons.

The committee on joint exhibitions presented a report in which members were urged to prepare exhibits for the Boston Exhibition, which was ordered to be placed on the file.

On the motion of Mr. Beach, it was recommended that the Society accede to the rules passed at Philadelphia

relative to the lantern slide interchange among societies, and the matter was referred to the Board, with power to act. After adjourning, a meeting of the new Board of Directors was held in the Library, when the several committees were duly organised. The Society begins its fifth year of existence under very favourable conditions, having a membership large enough to sustain it, which should enable it to be of considerable benefit. It is probable larger and more suitable rooms will have to be obtained to accommodate the increasing membership.

One of the interesting sights near New York recently which attracted many amateurs was the moving of the Mammoth Brighton Hotel on Coney Island; several hundred pictures were made of it. The hotel rested on 120 platform cars distributed on twenty-four tracks, and was hauled along by six locomotives in two pairs of three each.

N. Y., April 14, 1888.

### FRENCH CORRESPONDENCE.

PHOTOGRAPHY WITHOUT A LENS—DEVELOPMENT WITH HYDROKINONE—PORTABLE PHOTOGRAPHIC APPARATUS—PHOTOGRAPHY WITH MAGNESIUM POWDER—UNIVERSAL EXHIBITION OF 1889—FRENCH PHOTOGRAPHIC SOCIETY—SYNDICAL CHAMBER OF PHOTOGRAPHY.

*Photography without a lens.*—This question, to which at first but little heed was paid, tends to acquire importance since some new and very interesting results have been shown; proving the utility that may be made of this simplification of photographic appliances. It is very certain that we cannot achieve the rapidity and sharpness obtained in negatives taken with lenses; there is, however, an important advantage to be gained from the fact, that with one single apparatus we may, without changing our position, obtain images of various sizes. The only alteration required in the apparatus is to lengthen or shorten the distance from the camera front to the plate, and to vary the size of the opening, using an aperture of from  $\frac{1}{10}$  to  $\frac{1}{5}$  of a millimetre for small images, and of from  $\frac{1}{10}$  to one millimetre for images of larger size. Captain Colson, to whom are due the most important researches and studies on this interesting question, has recently pointed out a formula showing what should be the diameter of the holes to correspond with different focal lengths. Thanks to the improvements recently introduced in the construction of this little piece of apparatus by Messrs. Dehors and Delandres, portable photography is rendered complete, without having to carry a set of lenses such as would be necessary when we desire to take views including varying quantities of the subject. One of the most curious results that we have seen is by Capt. Colson. He has reproduced an engraving, and the copy shows no lines whatever. It would be supposed to be a copy of a mezzotint. Unless magnified to double the size, no trace of a line can be seen. This fact shows the possibility of transforming line or point images with continued half-tones; just the inverse of the process discovered some years since, of transforming photographs having continuous half-tone into line images for the engraving and block printing processes. We cannot too forcibly direct the attention of experimenters to this very interesting question of photography without a lens, the limit of the application of which cannot be foreseen. It is, moreover, certain to render greater service in proportion as the rapidity of our sensitive plates is increased. What limits its use at present is the length of exposure required in consequence of the small size of the aperture admitting the light. It results from this, that we can only operate on still subjects; but there is nothing to prove that we shall not arrive at instantaneity, and in this case we can foresee the great use that may be made of this simplification of photographic apparatus.

*Development with Hydrokinone.*—This developing agent, which has been studied and used for some years past in

\* See p. 257, PHOTOGRAPHIC NEWS.



England and elsewhere, has, so to say, met with opposition in France. It is due to our *confère* Mr. Balaguy that attention has recently been here devoted to it, and since his recommendation experiments have been everywhere made with it, and with more or less success. Perhaps there has been too much enthusiasm on the one side, and prejudice on the other, in what has been said with regard to the superiority of hydrokinone over other developers; it has, however, certain incontestable advantages. We have closely followed the contest between the friends and adversaries of hydrokinone, and have ourselves experimented with this product. We have arrived at the conclusion that it is useful to have at our disposition a choice of developing agents. Hydrokinone is probably not more energetic than pyrogallie acid, but it allows the work to be done more cleanly, and it may be employed for several developments without becoming too much discoloured. It gives images, both negative and positive, endowed with much limpidity and transparency. It can be preserved in closed vessels ready for use. There are cases where these properties will be much esteemed, and it is on this account that the introduction of this developing agent to the photographic laboratory is of great service. For the same reasons, the use of the pyrocatechnic product isomeric with hydrokinone, has been recommended; and according to Professor Benoit, it has some advantages over hydrokinone itself. It should also be noted that experiments might be usefully made with resorcline, another product of the same nature. *In medio stat virtus*, says the sage, and we should remember this maxim, and distrust equally an excess either of enthusiasm or criticism. The last word in developers does not belong to hydrokinone. Let us state what advantages it may offer us, without abandoning either pyrogallie acid or ferrous oxalate, and be ready to welcome any new and more powerful reducing agent than those already in our possession, that may be offered to us; the future is for those who have patience, and who know how to wait.

**Portable Photographic Apparatus.**—There is no meeting of the French Photographic Society or of the Syndical Chamber of Photography at which some new portable apparatus is not shown, each one more disguised, or more portable, than preceding ones. Detective cameras have had a great success. We have seen in turn that of M. Français (the Kinegraph), that of Mendoza, of David, and of Enjalbert. The idea of photographing the public unknown to itself has been, with good reason, freely taken up. It is, in fact, impossible to attempt in a street or public place the smallest photographic operation without being surrounded by a band of curious idlers. Generally speaking, one has to try that no one knows that it is intended to take a photograph, or else to make believe that it has already been done. Some models have metal work about them, the glitter of which is apt to attract attention. To those who possess apparatus of this kind we counsel the use of a black covering. The brass binding and luxurious mounting which may please the eye in the studio, should out of doors be avoided as much as possible. M. Cheneviere, a skilful amateur, has recently shown us a barrister's bag containing a camera. The latter is worked without being taken out of its covering. Whatever may be the means adopted, we cannot doubt the practical utility of the detective camera, and the detective camera makes way, whatever the model adopted. Our police regulations prohibit the making of any photograph in the public street, gardens, squares, and cemeteries, without authorisation previously obtained; but with a well-arranged detective camera we can go anywhere and photograph whatever we please, absolutely as we see it. There are now, in fact, a crowd of apparatus which conducs to the realisation of this end.

**Photography by the Light of Magnesium Powder.**—Here we have again a novelty which is not new, and which is causing astonishment and joy in our photographic world as if it dated from yesterday only. We speak of the photo-

graphic flash, or, in other words, of photographs obtained instantaneously with magnesium powder. Long before the patents of Gædicke and Miethé, the formulæ of these powders were known, and certainly there is nothing to call an invention in a fact already well known. At the present time people here are much occupied with the really interesting application of magnesium light to photography. Thanks to this means of illumination, we may succeed in photographing portraits, groups, and interiors, when, under the same conditions, we should not be able to do so, either by daylight or with any other source of artificial light. The diffusion of the luminous rays which proceed from a flash having a large superficial extent gives it a great advantage over the illumination which proceeds from a point so small as the electric arc, a lamp with magnesium ribbon, or the oxyhydrogen flame. Again, nothing can be more simple than to carry about a few grammes of powder costing but little. There are no complications to contend with, and in cost it is far below that of any other means of producing actinic light of sufficient intensity. Thanks to the magnesium powder, we may realize surprising effects; we have seen interiors admirably reproduced in this manner, and we may reckon upon some very curious applications of this instantaneous light. In this connection we would recommend that formulæ which contain chlorate of potash, sulphur, or a sulphuret, should be avoided. Spontaneous combustion may result from them, and accidents—often very grave—may be the consequence. The best method is to powder the magnesium dust on to the explosive cotton. Not only is the combustion rapid, but all danger of the explosion is avoided, as well as the production of deleterious gas or vapour, such as occurs with sulphur and with sulphuret of antimony. Magnesium, in burning, produces oxide of magnesium, which is an inoffensive white powder. Pyroxyline leaves no trace after combustion. It is best, then, to keep to this simple combination, the most economical and most inoffensive of all in every respect. One gramme of pyroxyline, powdered over with two grammes of magnesium dust, is all that is necessary for photographing a surface of small extent. It is very evident that the larger the field to be reproduced, the greater is the extent of the image, and the greater the intensity required at the place of combustion. With a little practice one might lay down the law of the proportions according to the included angle. On the other hand, it should be stated that a single flash suffices, and that it is a mistake to put a flash on each side of the apparatus, even if the flashes are of different intensities. We have observed that a flash placed more or less on one side, and behind the camera, is quite sufficient. Here, again, habit points out what is the distance at which it is necessary to place the light on the right or left of the apparatus, according as we require the modelling to be more or less strongly marked. If placed too much in front, the faces are flat. We need not fear to put the light at a distance of a metre or a metre and a half on one side; it is, we repeat, a question of practice.

**Universal Exhibition of 1889.**—If nothing happens politically, either domestic or foreign, to operate against the universal exhibition of 1889, everything leads us to believe that it will be superb. From the photographic point of view demands for space are numerous, having for France reached the number of 310, whilst for the 1878 exhibition they did not exceed 180. We have learned that, abroad, important participation is in preparation in spite of the refusal, from purely political motives, of some states to participate officially in this great manifestation. The goodwill, however, of the exhibitors is tried by the considerable number of simultaneous exhibitions. At the present moment there are exhibitions in preparation at Barcelona, Brussels, Copenhagen, Melbourne, and at Glasgow, without speaking of those at Vienna, Boston, U.S., &c. It results from this that people do not know which way to turn. They wish to satisfy all these demands, but cannot do all they wish, and so exhaust them-



selves without obtaining a useful result sufficient to compensate for so much effort. Here we see the regrettable side of this simultaneity. It is for this reason that we have not received as many applications for space at the Glasgow Exhibition as we ought to have done. It is for this reason that France will be scantily represented at Barcelona and at Brussels, although under other circumstances the exhibitors would have figured in much larger numbers.

*French Photographic Society.*—This Association is about to inaugurate in May next a new social meeting for an exhibition of photographic apparatus. The exhibition is limited to members of the Society, a proceeding which may procure fresh subscribers.

*Syndical Chamber of Photography.*—This very active group has for some months past been preparing for the 8th of May a conference specially limited to negative photography. Divers items of progress in the construction of apparatus, and in the employment of processes belonging to negative photography, will be passed in review. Three conferences are to take place each year—one for negatives, one for positives, and the third is to be consecrated to diverse applications. LEON VIDAL.

### INSTANTANEOUS SHUTTERS.

BY HENRY R. FROSTER.

THOUGH, in accordance with the English usage, I have adopted the above title, I certainly prefer the American one of "Automatic Exposers," as more correctly describing the aim and nature of the instruments in question. So much has already been written on the subject, that it would be difficult to say anything very novel; and probably the most useful thing I can do is to state concisely and clearly the most important mechanical points to be observed in the construction of a shutter, and then to add a few words of description of the most important shutters in the market, pointing out how far they agree with the conditions laid down as essential. Taking these in the order of importance they may be summed up as follows:—

1. The shutter must not shake the camera.
2. The illumination must be equal all over the plate, or greater for the foreground than for the distance and sky.
3. The shutter must let through as much light as possible during the time it remains open.
4. The exposure must be adjustable to constant and approximately known periods.
5. The shutter must be portable—that is to say, neither too heavy, too bulky, or too delicate to stand ordinary rough usage. It is convenient that it should also serve for time exposures.

There are three positions in which the shutter may be placed, and it will be convenient to consider their respective advantages before discussing the construction of the shutters themselves. These are (1) in place of the diaphragm; (2) immediately in front or behind the lens; and (3) close in front of the plate. A great advantage of the first position is that it has absolutely no effect on the equality of the illumination other than a stop has. If the lens illuminates evenly with full aperture, it will still do so with any diaphragm shutter. It is, however, well known to photographers that with most lenses, a peculiar sort of blurring is produced, if by accident a stop is so inserted as to admit two pencils of light from opposite sides of the aperture, owing to the correction of the lens not being absolutely perfect; and this effect must be produced in a greater or less degree by shutters which, like the Grimston and several other popular shutters, go and return in the diaphragm slit. I must own that it is not generally perceptible, but I should expect it sometimes to be apparent in enlargements and lantern slides, as a sort of slight one-sided blur. It is, therefore, better that the shutter should open centrally, and it is worth noting that this is practically accomplished by a simple drop shutter working in the diaphragm position, since the side of the aperture which was first to open is also first to close. Almost the only objection to such a shutter is the necessity of cutting the lens mount to let it go through. Another advantage of placing the shutter in the position of the stop (or close alongside it) is, that here the pencils of rays all cross, and hence pass through the smallest area; and the

aperture of the shutter may be small, and consequently light. This not only favours portability, but lessens the risk of vibration.

The second position near the lens has most of the same advantages, but in a less degree; it requires no fitting or altering of the lens mount, and is easily applied and removed, and it lends itself readily to giving the sky a shorter exposure than the foreground. In this position the shutter must on no account open centrally, unless the time during which it is fully open is very large proportion to that during which it is opening or shutting, for the result of placing a cap with a central hole in front of the diaphragm (or behind it) is to cut off all light from the edges of the plate while illuminating the centre. A shutter attached to the hood of the lens is generally in the most favourable position for shaking the camera if it produces any shock.

The third position, immediately in front of the plate, is in many respects the most favourable of all, but is probably the least popular, since the shutter is necessarily large, and has to be specially fitted to the camera. It has been explained that a shutter near the lens cuts off a portion of light from the whole of the plate during opening and closing, so that a longer total exposure is required than if this was not the case. The special virtue of the position close to the plate is that the portion of the plate which is uncovered receives the light from the whole of the lens for the whole of the time, and hence a narrow slit may be used, and the motion of the screen need not be very rapid, since each portion of the plate is only exposed while a comparatively narrow slit is passing over it. On the other hand, as different portions of the plate are exposed successively, it is quite possible that the picture, though sharp, may be distorted by the motion of the object during the exposure. Thus, a horse, running in the same direction as the motion of the shutter, would be apt to have its body abnormally long drawn out.

Leaving now the position of the shutter, we may discuss its construction. The first and most important point to insist on is, as I have said, that it must not shake the camera. With rapid shutters attached to the camera this can only be prevented in two ways: either the moving part must be so light that it bears no sensible proportion to the weight of the camera; or there must be two parts moving in opposite directions, so that the strains produced by the one exactly counterbalance those caused by the other. Of course the most perfect arrangement is one in which both these conditions are observed.

One of the oldest, simplest, and in many respects the best of shutters is the simple "drop," and a little time spent on it may clear many points bearing also on other forms. It is extremely easy to make, even for an amateur optician. In its most elementary shape it consists of a slip of wood, ebonite, or metal, with a hole in its centre, and working in grooves in front of, or behind the lens, or in the diaphragm position. When set for action the lower and unperforated part closes the lens, and in exposure it is allowed to drop so that the aperture passes in front of the lens, which is finally covered by the upper end; and the exposure of course lasts while the aperture is passing. So long as the drop falls only under the influence of the earth's attraction it is easy approximately to calculate the time of the exposure, since this attraction is one of the most constant of forces; and even if springs are used to accelerate the motion it is not difficult to estimate their force and their effect. Practically a body may be taken to fall  $\frac{1}{100}$  of an inch in the  $\frac{1}{100}$  of a second; and the distance increases as the square of the time. Thus, in  $\frac{1}{100}$  of a second the body will fall  $5+5+2=\frac{1}{100}$ . It will be noted that the shutter moves slowly at first and more rapidly as it goes down, and consequently the covering of the lens will take place more quickly than the uncovering; and if in front of the lens the upper part of it will be uncovered longest, and the sky will be more exposed than the foreground. The longer the aperture in the shutter, the less obvious this is, and the effect is also diminished if the shutter is propelled by a string or band which is strongest at first, and weakens as it is relaxed. If the shutter be behind the lens all this is reversed, and the sky gets less than the foreground, which is all right, and if between the lenses of a doublet, or in the diaphragm position of a single lens, the exposure is equal all over. Pumphrey has pointed out that the speed of the shutter may be much varied by turning it on the lens hood, so as to let the drop descend a slope instead of falling perpendicularly, thus at the same time diminishing the force and adding to the friction. If the "drop," or any shutter with only one moving part, be worked with a strong spring, the "kick back" is enough seriously to shake the camera. The lighter the camera and the heavier the shutter the more this

\* A Communication to the Newcastle Society.



will be the case, till, if we suppose a shutter the same weight as the camera, and both at liberty to move, both would move an equal distance in opposite directions. The shaking of the camera may be prevented by having two shutters moving in opposite directions, and a very good application of this idea is that first suggested by Mr. Noton, in which the "drop" consists of a band of thin leather with two apertures, which is passed over a roller so that as one end of it goes down the other goes up, and the apertures pass each other in the opening of the lens. In the original Noton shutter the band was worked by pulling one or other of two silk threads attached to the ends of the leather band, while other modifications, such as Sands and Hunter's, have been devised in which the band is actuated by a spring. This form is excellent in the diaphragm position, but in front of, or behind the lens, it cuts off the light from the edges of the plates. In this position it is better to have no apertures, but two solid shutters, one of which opens the lens as it rises, and the other comes down and closes it, thus giving a longer exposure to the foreground than the sky, as in Mr. Forest's "Due-ratio" shutter. The Kershaw may also be regarded as a flexible drop-shutter, and consists of a Mackintosh cloth band with a very long aperture working on a spring roller, like a railway-carriage blind. I have not found this to give any appreciable vibration, while it gives exposures for the smaller size of less than the seventieth of a second when fully wound, and the opening is so long that during almost the whole of this time the full light is admitted. Rotating shutters, like the Lancaster and many others, may be regarded as "drops," and are very compact; but unless the rotating part is light and well balanced they give a very appreciable shake, when worked fast, from the centrifugal force of the unbalanced portion. When balanced, the forces all counteract each other, except a slight rotatory shock at starting. Lancaster's shutter, when worked in the diaphragm position, gives practically equal exposure to the whole plate. If worked in front of the diaphragm it is easy to regulate this as required, by the form of the aperture, but if used for doublet lenses it cuts off the corners of the view, unless of rather unwieldy dimensions.

"Go-and-return" shutters, in front of the lens, are very compact, and give good exposure to the foreground, but more or less shock is unavoidable from the reversal of motion at the most critical point of the middle of the exposure. Perkin and Rayment have lent me for exhibition a very pretty shutter of this sort, in which the shock must be small from the lightness of the moving part; and there is another and very simple form, which was described in one of the YEAR-BOOKS, and which is worked by an elastic band. It would not be difficult to avoid the shock of this shutter by adding a slide between the hood and the shutter frame, so that the whole could have a little play, controlled by an elastic band, as in the home-made shutter which I now show, which is intended for very rapid exposures, and in which the moving "drop" is a mere frame with a flexible leather curtain.

Besides the Noton shutter, there are others which have a balanced motion and central opening, and which are consequently best adapted for the diaphragm position. Of these Wollaston's "diaphragmatic" is an excellent example, which—thanks to the kindness of the makers, Messrs. Eiesforth and Mudford—I am able to show you. The opening and closure are effected by two light metal segments moved in opposite directions by a spring, so that any shock is practically perfectly balanced, while, having long apertures in proportion to the size of the diaphragm, the proportion of light admitted is very good. The speed of the shutter is controlled by a friction brake, which, owing to its excellent workmanship, is said to give very constant results, and the stops may be altered by simply turning a milled head. To avoid cutting the mount of the lens the leuses are screwed into the case of the shutter, which replaces the original tube, and great care is taken in construction to avoid all risk of disturbing the centering of the combination, which is a weak point of some other shutters on this principle.

Mr. Dallmeyer has just invented a shutter which is perfectly central and balanced, and which actually works inside the lens tube, thus avoiding all risk of this kind. Though slightly different in details, I shall describe it most intelligibly as an "Iris" diaphragm of four leaves, which is worked by an arm projecting through the tube. Mr. Dallmeyer is still engaged in perfecting the details of this shutter, but when completed it will certainly be one of the most perfect in the market, both theoretically and practically.

A shutter with which very excellent work has been done is

the "Phoenix" or "Phantom" shutter, first introduced by Messrs Reynolds and Branson, of Leeds, in which the opening is effected by a flap, which liberates a drop which descends and closes the lens. The shutter at its best was a little cumbersome, and not capable of very rapid exposures, though I have seen a very fair photograph of flying seagulls taken with it; but it has now had so many contrivances and complications added to the original that I confess I should myself prefer a simpler form, especially as I think that a light flap will practically accomplish as much. A very excellent form of flap was described lately in *The British Journal of Photography*, of which I now show a form somewhat modified for the sake of extreme portability.

The regulation of the speed of shutters is difficult to do satisfactorily, merely by varying the tension of the spring, or by adding elastic bands (which are always to be avoided because they vary so rapidly in strength). We can only double the speed of the shutter by increasing the power fourfold; or more mathematically the force is proportioned to the square of the velocity, and if one elastic band gives an exposure of 1-10th sec., four stretched to the same degree will be needed to give 1-20th; nine for 1-30th; and sixteen for 1-40th sec. Thus it happens that no great range of exposure can be got by merely adding bands or tightening springs, since such large variations of power are required to produce moderate changes of velocity, and recourse must be had to friction in some form to reduce the speed for slow exposures. It is practically impossible to get a constant friction between solids, and there is an element of uncertainty in all shutters slowed by brakes pressing on a moving part. A happy thought of Mr. Newman was to utilise the American pneumatic door check principle to control a shutter. In this case a piston works in a cylinder, the top of which is covered with a cap with holes of graduated size, corresponding to the required exposures through which the air has to pass in and out of the cylinder as the plunger goes up and down. The special form of shutter now on the market has some faults inseparable from all to-and-fro shutters, but as regards regularity of exposure it is probably one of the best, as air cannot wear smooth like a brake, and its friction in passing through a given hole is practically constant. Another very simple and satisfactory application of fluid friction to check a shutter is that of Kershaw, who, by sticking a card into the spindle of the roller on which the screen winds, forms a fan which reduces the velocity by a quite constant amount. Light flap shutters, when working with a weak spring, are greatly checked in the same way by the resistance of the air, so that by diminishing the power it is possible to reduce the speed more than in most other types of shutter, and the air greatly cushions the shock. This form of shutter may also be made to give what shock it does produce straight back against the camera, so that, considering its convenience as a hand-exposer, it is a very useful shutter for moderate speeds.

I must not omit to mention that various shutters are in the market which regulate the exposure by a train of clockwork, such for instance as Addebrooke's and Boca's. Each of these first sets free a shutter which uncloses the aperture, and as the train reaches a given point a second shutter is liberated to close it again, just as an alarm clock liberates the striking mechanism at a given hour. If such shutters are accurately made, and the moving parts are balanced or so light as to avoid vibration, they will perform well; but their necessarily high course must always be a bar to their extended use.

Altogether there is room for further invention in the timing of shutters, which is just as important as the timing of longer exposures. The great point, however, is to use a shutter which may be trusted to give the same exposure every time it is set to the same tension, and to know approximately what that time is in each case. Many ways have been proposed for measuring the speed of shutters, all more or less troublesome and difficult. Probably the simplest is that proposed in principle by Mr. Albert Scott, in which a plate is exposed through the shutter, and again at a greater distance, to the same source of light, for the time giving an equal amount of density on development. I manage it in this way: In the first place I cover a dark slide with a piece of card covering all but a strip down the centre of the plate, and at, say, ten feet from a batwing gas burner turned to give a flame, say, two inches wide. I expose successive portions from one to ten seconds by drawing the slide out about a quarter of an inch, for each tick of a clock. I then take another piece of card twice the length of the slide, and cementing on a bung the same size as my lens hood, to take the shutter, I cut a hole through it and the card, say one-fourth of an inch by one inch, and fold the



card over the slide so that this hole will come on the part of the plate which in the previous exposure had been covered, while by pushing the slide along the card, which is secured to it by elastic bands, a considerable number of exposures can be made on one plate. Now, making these exposures with the shutter at a carefully measured foot from the same flame, and remembering that the intensity of the light varies as the square of the distance, we have only to develop the whole plate, and cutting in half for easier comparison, to find which of the exposures gives the same density, and for every second of the time exposures, we have 100th second of the shutter. Of course the size of the flame must be regulated so as to give exposures which can be well compared, and if the plate can be exposed at 14 feet 2 inches instead of 10 feet, two seconds may be counted to 100th instead of one. Though this method is not capable of very exact results, they are dependable as far as they go, and that is quite far enough for the practical purposes of the photographer, who really only wants to compare exposures.

### Notes.

Specially favourable arrangements have been made with respect to photographs in the British section of the forthcoming exhibition at Paris, as it has been decided to grant screen space for photographs, photogravures, and examples of photo-mechanical processes at a charge of 2s. 6d. per square foot. The charge for floor space is 5s. per square foot.

The usual attempt to bring in a photographic copyright bill has not yet been made. For the last five or six years various members have tried their hands at the undertaking, but it has always ended abortively. Apparently all hope has been abandoned now that private bill legislation has been so much curtailed. In many respects, so far as artistic copyright is concerned, this is not to be regretted, as some of the bills on the subject which have been introduced have been initiated by print publishers, and framed solely in their interest, which is not altogether what is desired. It is very certain that whatever bill may be devised, every contingency cannot be provided for.

The Pontefract magistrates have distinguished themselves by fining two unlucky photographers five shillings and costs, for following their ordinary occupation on Sunday. They were, of course, convicted under the Act of that most moral and pious monarch Charles II., who, if such a thing were possible, would griu at the idea of the Act being made to cover the taking of portraits. The thing is the more absurd in the case of photographic portraiture, especially just at this time, because the artists have been keeping open house for the last two or three Sundays, ostensibly to show their pictures out of pure good-nature, but really with the secret hope of bagging a buyer—a hope, by the way, which is frequently realized.

Of course, there has been a demand during the last few days for the photograph of Matthew Arnold. His photographs, though they were to be seen in two or three shop windows in the West End, never commanded a ready sale, and now that they have been asked for by those who knew the late poet and essayist, they are declared to be not a bit like him. The fact is, all the

photographs in the shops are at least ten years old, and a man changes a good deal in a decade. From the public's point of view, celebrities ought to go to their photographer as regularly as they go to their tailors. To the artist who is often called upon at a moment's notice to draw a portrait of somebody in whom the public are interested the practice would be invaluable.

What collection of epitaphs does not contain a transcription of the worldly-wise words which appeared on the tomb-stone of that late "Landlord of the Lion?"—the landlord who lay in his grave, it was stated, "in hopes of Zion," and whose astute relict caused the village stonemason to add that—

"Resigned unto the Heavenly will,  
His wife keeps on the business still!"

Doubtless, the epitaph is as well known in America as it is here, and this may account for the colourable way in which an enterprising photographer of Arkansas City has appropriated the idea in a *post mortem* inscription lately graven on his wife's tomb-stone. At the top of this stone, it must be explained, he has fixed a photograph of his lost spouse, and immediately beneath it come these lines:

"Pause, passing stranger! pause and gaze  
Upon the photo clear  
Of Mary Jane Belinda Stokes,  
My wife and partner dear!  
She's gone and left me all alone  
In this vast vale of woe,  
At No. Twenty Collin Street,  
Next door the Goods Depot!  
Where, striving my great loss to bear,  
And rivals for to beat,  
I'll take you—see above for style—  
For fifty cents complete!"

A nice case in point is furnished by the action of Raphael Tuck and Son against the *Graphic*. Mr. F. Sargent was engaged by the plaintiffs to paint a large picture representing the Queen's Drawing Room, and also, subsequently, to produce a separate portrait of the Queen. The plaintiffs were keenly alive to the value of the copyright in the latter picture, for in addition to the usual agreement that all sketches and designs prepared in connection with it should be the property of the publishers, the artist was further bound to devote the whole of his time and attention to the completion of the picture, and until it was completed should not undertake any other work or employment without Messrs. Tuck's consent.

Mr. Sargent obtained a twenty minutes' sitting from her Majesty, and, to save time, prepared three porcelain sketches from photographs, and made from life what alterations were necessary. The original porcelain from which the picture was produced was broken, and the *Graphic*, wanting to publish a portrait of the Queen, Mr. Sargent touched up one of the other porcelain pictures from the original picture. Messrs. Tuck, however, regarded this



as an infringement of their copyright, whereupon Mr. Sargent withdrew the touched-up portrait, and offered the remaining porcelain from which the *Graphic's* picture was made. Out of this arose the action which the jury decided in favour of the defendants.

The point of interest seems to centre in the question whether an artist or photographer commissioned to photograph a person or object over which the person giving the commission has no control has a copyright in any drawings or photographs he chooses to make other than those for which he has received the commission. Had her Majesty given the commission the case would have been simple enough, because she would possess a copyright in every picture of herself, no matter from what points of view it was taken. Messrs. Tuck, however, had a copyright only in those sketches necessary for their particular picture. The third porcelain sketch, we presume, therefore, the jury did not consider came within this category, and this consideration guided them as to their verdict. It is very certain that, stringently as the agreement between Messrs. Tuck and Mr. Sargent appears to have been drawn, it was not stringent enough. For the future, art publishers who wish to protect themselves must lay down the condition that whatever sketches or photographs, whether necessary or unnecessary, made of the subject commissioned, must belong to them. Whether artists or photographers will agree is another matter.

The importance of the spirit level on the camera as an aid to the out-door worker has often been insisted on in these columns, and notes have appeared as to the various forms of spirit-level available. An extremely neat form is one devised and registered by W. R. Wynne, and forwarded to us for notice. An ordinary tube level, but small, is mounted on a cross plate; which plate engages under the heads of two screws, the arrangement being shown by the accompanying cut. The opening in the tube is cut at an



angle of 45°, so that the bubble can be seen when the reversing frame is used, without shifting the level from its place. The ease with which the level may be put into its place or removed to a fresh position is noteworthy, and it may conveniently be carried in a hole bored in the tail-board of the camera. The cost is two and sixpence, and it is sold by G. S. Martin, of Brems Buildings, Chancery Lane.

There has been a whisper that it is in contemplation to arrange for photographic passports—that is to say, passports accompanied by photographs. Perhaps a useful hint in this direction might be taken from abroad. For some time past, the police authorities of Vienna have been issuing what are called “international identity cards,” consisting of a photograph on which a brief personal description of the owner is written in three languages—

German, French, and English—and to which an official certificate and seal are attached in such a way as to prevent the possibility of the exchange for the C.-D.-V. This is a very admirable idea, and it only needs the addition of the Dutch method of identification by measurement to make it absolutely perfect.

A well-known horse trainer, who has been discoursing in the *Star* concerning his method of treatment, keeps a photographic album containing pictures of the horses he has subdued. Some were of the most depraved character, one of them, which is said to have killed four men, looking out from the photograph, to use the interviewer's words, “with a dreamy smile that seems to say, how I would like to eat you without mint sauce.” The professor is a firm believer in the truth of physiognomy as applied to horses. “I see,” he says, “a horse with small eyes sunken in their sockets, a narrow space between them, small thick nostrils, large ears with long hair inside, and I know that if I turn my back that horse will bite me. He is vicious naturally. When his forehead is hollow, as though it had been scooped out, he is a tricky horse who will do little mean things and annoy the driver.” Here, it seems to us, is a chance for a profitable employment of Galton's composite system. Buying a horse is a little more risky than taking a wife, and as it is only the most experienced who can tell a vicious horse when they see him, a few typical photographs would be of immense service to the unsuspecting gentlemen who go in for horseflesh at Tattersall's or Aldridge's.

We are asked by a correspondent, “What would happen in case an occupant of the Stranger's Gallery at the House of Commons were caught red-handed in the act of taking a surreptitious photograph of the House.” The only answer we can give is, that which a former Mr. Speaker made when he was asked what would happen should he feel it incumbent on him to “name” a member. “No one knows!” was his emphatic reply; and we can make no other.

During the present session, the question of the future of the Duke of York's Column will be again brought before the House of Commons; for the time is at hand when steps must be taken by the Government to place its future custody and maintenance on a new and permanent basis. When the matter is discussed, Mr. Plunket will probably be able to tell the House whether it's a fact that an enterprising Yankee photographer had offered to take the column off the Government's hands, and to guarantee its future maintenance, on condition that he is allowed to turn the cage at the top into a photographic studio. It is rumoured that he would be prepared to take each customer's portrait, brush his hair by machinery, weigh him automatically, and give him a ride in a hydraulic lift for a shilling; but these details must be, to say the least, incomplete, for nothing is said in them about turning to practical account the lightning conductor which goes up the Duke of York's back; and we may be quite sure that no 'cute Yankee, in these days of electric resource and ingenuity, would miss such a capital chance as that.



## FEMALE EMPLOYMENT IN PHOTOGRAPHY.

BY EMILIE COLSTON.

THE constantly recurring subject of the redundancy of the female population, and their need of employment, having lately again come before the public, I propose to consider what openings are afforded for the purpose by the photographic art.

The question has been mooted by Mr. Walter Besant, one of the most popular writers of the day, in *Longman's Magazine* for March last. Mr. Besant is an author to whom all must look with respect and gratitude. He writes "with a purpose" not perhaps invariably, but as a rule, and has evidently been lately much exercised on the subject of women's position and needs.

The brochure "*Katherine Regina*," which appeared as a Christmas number of "*Arrowsmith's Annual*" last year, was a most successful effort to direct public attention to this matter, which is no doubt one of very grave importance. It has been suggested that parents should, to provide for their daughters, invest an annual sum for an endowment, despairing of the capacity of women for self-support.

This is indeed a lame conclusion. The question is: Why should not unmarried women support themselves? None but the man who bears the burden of a life of mental labour with anxiety, in these times, knows the strain which it involves on the mind and temper—except, perhaps, his wife. The years increase, so do expenses; and to put upon the father the obligation of making such a provision is unwise and impracticable.

What is there that should give unmarried women an immunity from work? and why should they not exercise their faculties in a manner so beneficial to themselves?

If parents would but look upon marriage as a contingency, and not a necessity for their girls, they would at once realize it as a duty to train them from early youth to that employment for which each individually may be most fitted, instead of bringing them up with and encouraging them in the superstition that at the right moment someone or something will appear to supply their necessities.

What is the outcome of this—the present manner of fulfilling responsibility towards daughters? The father dies, or fails either in health or business. His girls are thrust out into the world to compete with men who, probably, have been apprenticed to their work in boyhood. There is little chance for them to earn a living, however intelligent. They struggle on for a time, and eventually join that sad multitude known as the "Unemployed."

Is there any practical result from the voluminous correspondence written by "the public" in the columns of the *Daily Telegraph*? Doubtless, it has increased the discontent and hopelessness of many—but if in a few it has aroused a determination to perfect their labour, thereby raising it to marketable value, the space given to the expression of general opinion has not been wasted.

Photography is an art which is especially fitted for the employment of female skill and labour. The duties of the reception room—retouching, printing, mounting, and colouring—are already acknowledged to be within the sphere of woman's abilities. Why not the studio work? There is nothing in it that requires violent physical exertion, to which the female frame would be inadequate. The faculty most strained is the eyesight. This, in woman, is as good as, if not better than, in men.

Seeing that men, in many houses, have taken a post which was formerly almost exclusively given to a lady (i.e., the reception room duties), it behoves women to at once study for and perfect themselves in the work of the studio. They have now entered the arena with men in professions which (before they had the opportunity of developing their talent) were held exclusively by that sex spoken of as "the sterner." Have they neglected or disgraced that opportunity? No! In consequence of it we

have had Dr. Garrett, Dr. Anna Kingsford, and our American cousins, their "Portias."

Photographers can do much towards raising the standard of their female employes' work, and giving them an interest in the artistic merit of it, by following the example of one of the ablest among them; that is, by requiring his assistants to study drawing, and taking the personal supervision of it. Should principals be either disinclined or lack ability to do this, it might be rendered compulsory for employes to attend an evening art class, as is the custom in one of our best known potteries. If this were done, we should not continue to hear of a positive dearth of talented artists to execute orders for both oil painting and miniature work. Instead of experiencing this want, photographers would have a well-supplied staff of reliable workers.

The above hints are my contribution to the settlement of the question, and may serve as a foundation for the expression of the views of others.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.\*

*Photography and Meteorology.*—The communications of Prof. Janssen, of Paris, who some time ago visited the meteorological and astronomical observatory on the Pic du Midi in the Pyrenees, where he took a series of photographs at different times of the day, have been reproduced by many German journals, and have excited considerable interest, especially amongst naturalists. On this occasion Dr. H. Servus points out that Mr. Janssen is not the first who suggests the employment of photography for meteorological purposes. The sun photographs of Professor Zenger, of Prague, which he has taken every day since 1877, have sufficiently proved the great importance which photography possesses in relation to meteorology. In these photographs, around the sun pictures rings are often to be seen of a circular or elliptical form, and of a white or greyish colour. These zones, as these phenomena may be called, often extend over the sun picture itself, and impart to it a greyish colour. Continued experiments of this kind have shown that these zones appear heaviest, and are of a very large diameter, if violent storms, thunderstorms, or magnetical disturbances set in at the place of observation, and, moreover, these zones generally appear twenty-four hours before the setting in of these disturbances. These phenomena prove, therefore, that they must have their origin in the atmosphere of the earth. So these zones indicate by their form and their colour approaching atmospheric and subterranean disturbances. On the sixth of the last month, the author took some photographs of the sun, which are exceedingly characteristic. Enormous conical zones, like tongues, surround the sun's disc, and around it are circular rings of ten times the diameter of the sun. The photograph taken lastly, shows considerable variations in comparison with the first one, though there is an interval of only two minutes between them. The prediction of storm and rain, founded upon this phenomenon, has been fully confirmed; already at seven o'clock in the evening the storm began, rising until the evening of the next day to a typhoon, and being accompanied by heavy showers. From this it will be seen that photography was employed for foretelling the weather long before Mr. Janssen made his experiments on the Pic du Midi. It is only desirable that taking photographs of the sun—for which an applanatic lens of 14 millimetres aperture is sufficient—might be more generally exercised, but especially that such experiments might be made at various places of the earth, so that by comparison of the results a prognostication of the weather of the following day or days might be made.

*The Hydrokinone Developer.*—During a trip through Germany and Austria from which I have just returned,

\* Continued from page 247.



I have had occasion to notice that in many photographic studios of fame the new hydrokinone developer is much preferred to the iron or pyrogallie acid developer. It is true there are many operators to whom the hydrokinone developer is still a stranger, and who assert themselves unable to succeed with it; but the greater part of the photographers to whom I have spoken appreciate the value of the new agent and its many advantages over its competitors. I have myself employed the hydrokinone developer exclusively for the last four weeks, and have always obtained beautiful, clear, and vigorous negatives with it, even in cases when, with the iron developer, the negatives would undoubtedly have come out fogged. In my opinion, the reason of the non-success of many operators lies in the fact that for developing, the hydrokinone solution is poured into a dish in which previously some other solution has been used, and which has not been sufficiently cleaned. This seems to be especially the case if traces of pyrogallie acid solution or of sulphate of iron come in contact with the hydrokinone solution, by which the developer is spoiled at once. I use a solution according to the formula recommended by Balaguy, but with a slight modification in mixing the solutions.

A.—Sulphite of soda	...	...	...	250 grammes
Water	...	...	...	1,000 c.c.
B.—Carbonate of soda	...	...	...	250 grammes
Water	...	...	...	1,000 c.c.
C.—Hydrokinone	...	...	...	10 grammes
Alcohol	...	...	...	100 c.c.

For use I mix 200 c.c. of A with 100 c.c. of B, then I add 20 c.c. of C. The price of the hydrokinone has already been much reduced. It is now manufactured by Schering, of Berlin, at the price of 30 marks (30 shillings) the kilogramme, consequently it is cheaper now than pyrogallie acid. Dr. Bannow gives in the *Mittheilungen* a formula to which I should like to direct the attention of your readers. It has, above all, the advantage that it contains no alcohol, which always makes a developer expensive.

#### Solution A.

Hydrokinone	...	...	1 gramme
Sulphite of soda	...	...	5 grammes
Distilled water	...	...	60 to 80 c.c.

#### Solution B.

Soda, crystal, pure	...	...	1 gramme
Distilled water	...	...	8 c.c.



For use, 3 parts of solution A are mixed with 1 part of solution B. If the solutions are below 65° F., the image will not entirely have appeared before six to eight minutes; if, however, they are above 65° it will appear in two to three minutes.

*The First Daguerreotype Made at Berlin.*—In a Berlin newspaper I find a notice about the first "light-picture" or Daguerreotype made in this town fifty years ago. (This must, however, be a mistake of the news-writer, as Daguerre's invention, as is known, was published not before 1839.) This picture, it is said, was made by the mechanist Dörffel, probably the father of the present court-optician and counsellor of commerce, Paul Dörffel, and it represented the railing of the then newly-erected castle bridge. Professor Felix Eberty, a contemporary of this glorious inventor to whom the picture was shown shortly after, says about it in his "Memoirs":—"The silver plate on which the picture had been taken was black and blue, and had to be shifted to every direction in order to discriminate anything." The next pictures, taken in the same way, were a little better. The exposure

at that time still required about fifteen minutes, so that only lifeless subjects could be photographed. Head-shaking the question was asked, whether one would ever succeed in producing a portrait by this process. Prince Metternich, who consequently was one of the first amateur photographers, caused a country girl to sit still for a quarter-of-an-hour, and the young person stood the torture so courageously that an excellent portrait was obtained, which subsequently was exhibited by the fancy stationer Sachs, of Berlin.

*Cronenberg's Photographic Institute at Gronenbach.*—Of this renowned establishment for instruction in the old and new methods of photography I have spoken on a previous occasion. I have now been favoured by Mr. Cronenberg with a sketch of his buildings, which I give here. The institute is located in the Bavarian Algan in Germany, among green and brightly coloured meadows, in view of the Algan Alps. Practical instruction is given in all the departments, and every young man can soon make himself familiar with whatever is technical in every branch of photography.



## COMPOSITION.

BY JOHN FISHER.\*

IN addressing you gentlemen present on the subject of composition, I am labouring under the serious disadvantage of being expected to speak on the subject as it relates to photography, when I know almost absolutely nothing about the scientific working of the same. But, with your permission, I will endeavour to confine my remarks within the limits which close round pictorial and sculptural art.

One of the first important points we have to look forward to is the great need of training the eye to see the exquisite beauty that untouched nature presents to us. It has been rightly said by many eminent artists who have gone before us, that the real artist is not the man or woman who sits before his or her canvas, thinking of all kinds of ideas (which appear to them to be so grand, and which they purpose to work out, so as to give individuality to their own work), but rather the student who has not the ability to draw a single true line, but who can understand and appreciate the grandeur and beauty of nature, and assimilate the same with their very existence, and by so doing be able to view with sympathy and joy the very many objects that nature has put us in our everyday life.

In mentioning the artist who sits in his studio laboriously studying from day to day and designing all kinds of ambitious schemes with which to make his own name, I only wish to convey to your mind one whose very conceit has so eaten away his sight that, even if he was anxious to study nature, he could not do so because of his own overpowering self-esteem. Therefore, I think it is clear to us all, that if we really desire to have and cultivate grand thoughts and ideas, we must, in the first place, go direct to nature for her to supply us with the theme.

As an evidence of what I say let us look at Turner's paintings, which represent Nature as such a glorious paradise. We cannot help but wonder where and how he managed to see such wonderful effects which he managed so dexterously to throw into his works. We even feel inclined to say that he never did see them; but I think it is the same with you as it is with me, that such thoughts only come into our minds when we are in the centre of this murky and oft-time depressing city.

But wait until we have climbed the hill, and then an entirely new class of ideas crowd into our mind. Let us imagine ourselves on the Downs. The month of the year is August; the time of the day is when nature puts on her ruddiest garb, and everything is presenting a most cheerful and warm appearance. We look at the sky, and then we are struck by a very vivid dash of yellowish colour, which is losing itself in another patch of still more brilliant crimson, and that is dying off to a beautiful warm grey, which, in its turn, is turned into a delicate blue, and even that again is backed up by a pale green. We see it—that we cannot help doing—but how very few of us can assimilate those wonderful colours with our own nature. Again, we notice a dark, heavy, straggling cloud coming along, and we prophesy respecting the weather, and there we leave it; yes, we leave it there, and it was there that Turner took it up. It was he, beyond everybody in his day, that saw the composition that Nature undisturbed had given him to copy. He saw how the yellow was concentrated upon the different projecting points of the landscape, giving prominence to the most important; how the crimson warmed for him the parts which would have appeared crude and raw if left to the mercy of the yellow. He saw that the grey was there to give reality, and to subdue what would otherwise have been too glaring; and he further saw how beautifully the blue and the green added to the whole as a harmony grand, but composing.

I dare say that some of my remarks sound very poetical; I trust they do, for the nature which is proof against poetry and enthusiasm is the one nature which is blind beyond everything to the natural poetry which surrounds us.

Composition, as we all know, is the positive making or marring of all important art works. It is the one vital influence which attracts the eye either for good or bad; so therefore, it is of the greatest importance to give it more than the ordinary amount of thought that we should bestow on the other branches.

To gain value to what I say, we will take for instance the grand works by Michael Angelo, Raphael, Lorenzo, Ghiberti, Hans Holbein, Cellini, and, indeed, almost all the old masters, who won for themselves in the stage of early childhood in art great praise for their aptitude at good composition.

Mr. Ruskin says that composition means literally and simply, a putting together of several things, so as to make one thing out of them, the nature and goodness of which they all have a share in producing. Thus a musician composes by putting notes together in certain relations; a poet composes a poem by putting thoughts and words in pleasant order; and a painter a picture by putting thoughts, forms, and colours in pleasant order.

In all these cases, observe, an intended unity must be the result of composition. Everything should be in a determined place, performs an intended part, and act in that part advantageously for everything that is connected with it.

Taking it for granted that Mr. Ruskin's ideas are of the clearest and best kind, we find, then, that composition is intended to affect the mind of the person who looks at your picture (of course supposing that the said person is tolerably sensitive and intelligent) by the matter of the work and the way it is arranged, or composed in order to be presented to him.

Further, it is supposed to exercise a moral and intellectual effect on the spectator, and to produce that feeling of pleasurable sympathy that we always feel when looking at the beautiful.

Now, in the application of composition, there should always be a leading idea, so that an uninformed person who does not know the motive or purport of your picture may be at once able to grasp at your idea with ease. What I mean by this is, that the leading idea should be so surrounded by objects possessing lesser value, that due prominence is given to the one part which has formed itself in your mind as partaking of the greatest amount of interest.

We will take, for instance, the Rembrandt style of painting, and we at once catch at the peculiar patch of light he habitually threw into the centre of his pictures, and which he evidently placed there to attract the eye to the parts which constituted his leading idea.

Then, again, take nearly all the Madonnas and Child painted by the different old masters, and we immediately notice how the wall of light made to appear round the head of the infant Christ at once gives prominence to it, and here again we see into the artist's idea.

These kinds of composition are not of the most advanced class, because, we all know how very readily the eye will travel after a bright light, particularly in the little few months old child. Has it not struck you how strange it is that this is so? And further than that, have not your thoughts run on to the application of such a simple method of attraction?

Then, again, we find that artists endeavour to catch the eye at a certain point by a bit of vivid colour; and after the eye has rested there, then it is carried off to other parts of the picture by other colours less vivid, but still strong enough to attract. The eye is also to be caught by the introduction of some peculiar feature or object, which the artist has fastened his mind upon.

It is said—and I don't think that any of us can get away from the fact—that the composition of light and shade is the real underlying principle of all compositions. Take it as we may, we are compelled to admit that strong lights, and of course deep shadows, in all kinds of pictorial art, are the means of making a more attractive, appealing, and satisfying work, than if we had contented ourselves by shading or toning the lights into a grey, instead of giving them with their natural force and freshness.

Understand me clearly on this point. I don't mean to say that the toning down shades are not to be used, but I do mean that they can be used in such a manner as to leave a bright sunny effect behind.

We notice in landscape painting how some artists will give up nearly all of their picture to give prominence to one particular group of objects in the foreground, and which his leading idea has suggested for there. Again, we see another class of artists carry their point of interest right back into the middle distance, and still they have so toned down their foreground as to make it subservient to that point; whilst a different class of artists from another school will, by a very clever arrangement of light, give such prominence to the extreme distance as to bring it out beyond everything in the picture, and so, by concentrating their bright light on their one idea, they have produced a work which not only gives the most delicious pleasure, but also fills the spectator with wonderment.

Leaving composition as it is governed by its lights and shades, and coming to the composition of lines, we find all the best works are those which have been painted or carved by artists

\* A Communication to the Bristol Camera Society.



who possessed a perfect knowledge of what Hogarth calls the line of beauty.

This line, or lines of beauty do not belong only to one section of art, but is owned by all sections; still, in my opinion, it makes itself more felt in compositions where figures are introduced, as also where animals are brought in; but for all that, we find that landscapes are also governed to a certain extent by the introduction of this line, or lines.

I dare say some of you gentlemen know how very difficult it is to find an interesting subject, all nicely prepared for you to take. You look, and look again, for some favourable position that will give you a good balance throughout, and doubtless you are inclined to imagine certain effects which could easily be produced if you could only introduce a line which would spring from a certain point in the landscape, and carry on the eye to another point; and I shouldn't wonder if you don't feel annoyed to think that you cannot manage to move certain objects so as to replace them, and thereby obtain the desired line.

It is here where the picture painter has an advantage over the photographer: he can at will put in certain objects of figures which will blend in with his work and give him the required line, and by his harmonious colouring produce the whole as one piece given by nature.

The lines which are used are not needed to be severe unbroken ones; rather let them be of an irregular turn—that is, unless you are dealing with sea shores or mountains in the distance, then you may call into use the long sweeping lines which so impress upon you the idea of getting over the ground quickly, and also because they mostly resemble natural forms, as seen in the dim distance, such as the lines of extensive plains or of tolerably calm seas. They are, in fact, perspective lines which carry the eye back from the foreground into the middle distance, and still further away into the far-reaching distance which is forming the background of your picture.

I have said nothing about the composition of skies, because the rules which apply to the landscape will apply to the skies also; yet the student must always bear in mind that in the case of precedent the sky should in nearly every case give way to the landscape.

There are many things that I have left unsaid respecting the composition of landscapes which relate to its evenness of distribution and its arrangement to make it fill in certain shapes, and also of the abundant poetry to other compositions, where figures and animals are introduced; and of course we cannot overlook that important fact that a very great deal of the success of any picture depends on its composition and harmony of colour. But time will not allow me to notice these points, so I must therefore pass on to composition as it concerns the human figure.

To pose a single figure in anything like a beautiful position the artist must first have a thorough knowledge of facial anatomy, so as to enable him to at once determine in his own mind what muscles he is desirous of bringing into action, and also the purpose for which these muscles are so brought into action.

Before we go any further, let us call to mind the fixed, rigid, and generally annoying positions that the early Egyptians posed their figures in; and then see how the Chinese and Japanese still are inclined to use their figures. And let us also follow the Greeks and the Romans in their endeavours to put the figure on a proper footing as regards its natural beauties, and its aptitude for ornamental purposes; and after passing over the great decline of art, and coming again to the time of Michael Angelo and Raphael, we will rest awhile with our minds bent on their beautiful examples, and in so doing we find ourselves losing entirely all the rigid stiffness which the Egyptians saw in the figure, and in its stead we come upon a grand composition of curves, as it were, rolled together in one rich and over-powering monument, which has been rightly termed the lord of all creation.

It would take up too much of your time for me to enter into any details respecting the actual posing of the human figure, so I must content myself by advising you (and this I do most strongly) to well study the different antique figures which are the very embodiment of all beautiful forms, and endeavour to impress upon your own mind the different lines of beauty which are brought about by one limb running in and blending with another; observe how the composition of one lot of muscles strengthen the beauty of a corresponding group; and how Divine nature has, by such wonderful power, bestowed upon each one of us her most beautiful gift.

## Correspondence.

### REGULATIONS AT EXHIBITIONS.

#### DISCUSSION AT THE CAMERA CLUB TO-NIGHT.

DEAR SIR,—Will you kindly give space to announce that the special meeting at the Camera Club last Thursday, 19th April, called to discuss the important subject of "Regulations for Photographic Exhibitions," stands adjourned to Friday next, April 27th, at 8 p.m., to complete the consideration of the matter. All interested in the discussion are invited to be present.

The meeting already held was well attended by leading members of London societies, and full particulars expressing the opinions of provincial societies and of leading exhibitors were received.

At the conclusion of the meeting, the Rev. Lambert's address, and a full report of the discussion and letters received, will be forwarded to you in the hope that you will insert them in the News. G. DAVISON, Hon. Sec.

*Camera Club, 21, Bedford Street, Charing Cross, April 24*

### DIFFUSION OF FOCUS.

SIR,—Mr. Debenham, by his letter in your last issue, necessarily mounts his pedestal and poses in a dual capacity as the champion of "candour," and for "those who have not made a study of optics."

His position is not enviable, for, from the point of candour, it would have been better, had Mr. Debenham intended to apologise for his mis-quotation, to have done so in a more graceful manner; he appears practically to accuse me of altering the sense of my paper since it was read, by the insertion of what he calls "qualifying words," thus nullifying the apology, and charging me inferentially with, at least, an ungentlemanly action. Moreover, he states that "the argument does not in any way depend upon any admission or statement of Mr. Dallmeyer's, but is complete in itself." This again is hardly candid when Mr. Debenham brings the mis-quotation as an argument against me.

As the champion of "those who have not made a study of optics" it is extraordinary that Mr. Debenham does not refute (if able to do so) one single word of my previous letter, containing the clear demonstration of the advantages absolutely gained in the particular application of lenses possessing positive spherical aberration for portraiture. In fact, the only point of demonstration dwelt upon by Mr. Debenham in his last two communications is one that supports me in my previous arguments, viz., the concentration of light towards the centre of the circle of confusion for objects more distant than that focussed for. The late Mr. Thomas Grubb, on whose authority Mr. Debenham appears to rest, distinctly acknowledges this, but says, as does Mr. Debenham, that "the antidote to the advantage will be found at the opposite side of the focus, &c." I pointed out clearly in my last letter that the practical benefits involved in the treatment of this subject can only be discussed from the standpoint of practical utility in portraiture.

I plainly shewed from Mr. Grubb's own measurements that the advantage for the uncorrected lens is not relative but absolute on the side of the focus, nearer to the lens itself, corresponding with points in the object more distant than the point focussed for, and also that the advantage rests with the uncorrected lens by contrast of definition at the focal plane and the out-of-focus planes in the same direction. Hence there is clearly a triple advantage for the lens possessing outstanding positive spherical aberration.

1st. Greater concentration of the central rays for more distant objects, as acknowledged both by Mr. Debenham and Mr. Grubb.



2nd. Absolute gain in diameters of the circles of least confusion, as demonstrated by Mr. Grubb.

3rd. The enormous gain as regards contrast in definition, as shown in my last letter—viz., a difference of only 114 measured parts as against 190 in the corrected lens.

My claims for the advantages on the side of the lens in question cannot fairly be refuted by Mr. Debenham or any other photographer; and they are founded on the ground that it is chiefly and almost entirely the better definition of planes beyond the point focussed upon that we are aiming at, neglecting as far as possible the question of foreground, where the disadvantageous conditions would appear. And so I would say to Mr. Debenham very distinctly that I have succeeded in proving to the ordinary intellect that my late father did introduce, in his patent portrait lens, an instrument that gave better definition in the out-of-focus planes involved in producing a portrait at the sacrifice of sharpness at the main focus; and now call upon Mr. Debenham to have the candour to acknowledge that he is wrong.

My previous letter dealt with the case of an equal amount of depth of focus, both in front of and behind the point focussed for, and frankly acknowledged that the late Mr. Grubb sustained the grounds of his objections to the introduction of positive spherical aberration from the standpoint of circles of least confusion when the average of the limiting circles was measured. This, however, is not requisite in practical working, and it appears to me that this view of the question was quite overlooked by Mr. Grubb, for in the same volume as the paper referred to appears, there is another (April 12, 1867) on "Producing Diffusion of Focus in Photographic Images, &c." In this Mr. Grubb inclines to favouring the perfectly-corrected lens when "the character of the indistinctness is the same at either side of [i.e., within and beyond] the focus"; for he afterwards says, in speaking of a lens possessing positive spherical aberration "in rather striking contrast, &c., &c., the character of the indistinctness is in such a case quite different at either side of the quasi-focus."

It is, however, as before stated, the advantageous character of the indistinctness produced by objects beyond the points focussed upon, the absolute gain in definition, and the reduction of striking contrast, that have warranted my late father's invention becoming the valuable instrument it has proved.—Yours faithfully,

T. R. DALLMEYER.

SIR,—Surely it is rather late in the day—after twenty years—to commence theoretical discussion on the merits of an instrument which, during that period, has been in the hands of the majority of photographers, and its qualities practically tested.

As for myself, I am still of the same opinion that I submitted to my readers in the second edition of my "Photographic Manipulation," pp. 42 to 46.

We were then, and we are now, restricted in our desires, whilst arranging a composition, by "shallowness of focus." Any palliative was welcome, since a perfect cure was impossible. Mr. J. H. Dallmeyer placed in our hands a power, the use of which was entirely left to our own discretion, but which, in the majority of cases, decidedly offered amelioration and artistic results.

The shallow line of extreme sharpness, which was in close contact with blurred forms, became, by its use, disseminated, as it were, and a deeper zone of moderate definition replaced it.

I believe that result was pretty generally approved of; otherwise, how to account for the sale of thousands of these instruments, extending over so lengthened a period?

Like other points in photography, a grain of tangible and visible result is worth a hecatomb of theoretical disquisition.

I have no interest to serve in writing this. I have not seen or in any way communicated with Mr. Thomas Dallmeyer since the matter was broached; but I think, as

my name has been brought into the discussion, it is only right to give my opinion respecting it.—Yours truly,

LAKE PRICE.

SIR,—I fear your readers are by this time thoroughly weary of the "diffusion of focus" question, important though it be. But I shall be glad to correct an error of inadvertence. My phrase (p. 226), "the shorter focus giving a sharper point and larger halo, while the longer one gives a smaller halo but a less distinct point," should have been reversed. It is, with positive aberration, the longer focus which gives that large range within which the image retains considerable sharpness, while the halo expands. For the rest we must agree to differ. Mr. Debenham maintains that the sacrifice of sharpness at the focus is accompanied by a general sacrifice of definition. There I must certainly differ from him. But while the gain in evenness of definition resulting from softening of the true focal plane seems to be pretty universally appreciated, a gain in the out-of-focus planes is really difficult to verify. For we have, as it were, to define "definition," that we may compare out-of-focus planes in applanatic lenses with planes involving equal differences of conjugate foci in lenses affected with aberration; and in doing so to oppose that clear advantage given by a little residual aberration; that some rays may then cross their axis at the image, with the apparent disadvantage that others wander further than they would have done if aberration were corrected. The disadvantage seems to me rather apparent than real, because as these more extensive wanderings appear to us in the form of a softening halo round a fairly defused centre, their effect is rather to weaken the shadows than to confuse the lights, and the resulting image appears softer, yet to have more detail. As to whether this effect is on the whole to be preferred, not only may tastes differ, but circumstances alter cases. And Mr. Dallmeyer's special claim was, that with his lenses, the operator can use his judgment by only introducing aberration when he pleases, and as he pleases. If there should be in the market a lens of Petzval's in which aberration may be similarly introduced, at the same time flattening the field, I quite agree with Mr. Debenham that it might be a valuable improvement, and it would be most interesting to compare its effects with Dallmeyer's lenses. But I fear it will be found practically impossible to combine all these advantages—restoring perfect definition at will. For in the Petzval lenses, not only are the curves shallower, but the rays are not nearly so intensely convergent when they emerge from the penultimate lens as in Dallmeyer's combinations, which are evidently expressly so arranged, that a small separation of the lenses may produce a maximum effect on the aberration, without sensibly disturbing the balance of dispersion. To permanently sacrifice some definition for the sake of flatness of field, as well as increased softness and evenness in portraiture, is another matter. If Mr. Debenham thinks there is any plan of the kind worth practical attention, I cannot but sympathise. If successfully, it will be one more power.—I am, dear sir, yours truly,

W. H. WHEELER.

## Proceedings of Societies.

### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE technical meeting of this Society was held on Tuesday last, the 24th inst. The chair was occupied by W. BEDFORD.

The attention of members was directed to the International Photographic Exhibition to be held at Vienna in September and October next. Prospectuses of the Photographic Convention and the Photographic Benevolent Association were also distributed.

Some lantern slides of the interior of a coal mine, sent by A. Sopwith, were shown on the screen, and a letter was read



describing the manner in which the negatives had been taken. Strands of magnesium wire had been used, fitted in front of tin reflectors of parabolic form. Several such sources of light were used in order to throw the light more equally into what would otherwise have been masses of shadow without detail. The subjects illustrated the toilers at different parts of their work.

W. E. DEBENHAM mentioned having many years since photographed the interior of a mine with magnesium wire, bundles of which had been inserted into pieces of clay stuck on to curved sheets of tin plate. Collodion being then in use, of course much more magnesium was required than would now be wanted with gelatine plates. As it was not desired to throw the illumination on to points merely, and as the source of illumination was not itself a point, he did not think that there was any necessity for making the curve of the tin parabolic.

ARNOLD STILLER, when photographing the interior of chalk cuttings some years ago, had used magnesium wire burned in glass jars of oxygen. In this case the space in which he had worked was so confined, that if the magnesium had been burned in the air, after one picture had been taken the fumes would have prevented another exposure being made for some considerable time.

W. T. WILKINSON showed a whirling apparatus for use when coating metal plates with albumen or gelatine for transfer processes on zinc. The apparatus consisted of two boards hinged together at one end, and furnished near the other end with a row of wire pegs. The plate was placed between the boards, and held in place by the pegs. An elastic band held the boards together, and the hinged end was attached to an ordinary carpenter's stock. The centre of the stock was taken in one hand, and a whirling rotary motion given to the whole. The plate being held face downwards dried free from dust, and the time required was only about fifteen seconds for an albumen coating, or thirty seconds in the case of bitumen.

W. ENGLAND showed some photo-lithographs from etchings, also one of the negatives that had been used. There was no difficulty in getting any amount of density, using rapid gelatine chloride plates, and developing in the ordinary manner.

W. T. WILKINSON said that density was not so important as perfect clearness of shadow. The way to judge whether a negative was fit for a line transfer process was not to look at it against the light in the usual way, but to lay it on a sheet of white paper, and see if the lines were quite free from deposit. Any intensifying process was bad, as it was sure to clog the lines.

C. WHITING showed an instantaneous shutter in which the opening and closing of the aperture were achieved by a blind passing over a roller. He considered it important that there was only one continuous motion, so that any jarring would only take place at the completion of the exposure.

The Chairman had used a somewhat similar shutter made by Dallmeyer.

A Member had found a shutter on the rolling blind principle, which he had used some seven years since, work more satisfactorily than any other instantaneous shutter that he had tried.

T. SAMUELS showed a changing box for twelve 1-1 plates, to be used as a dark slide on the camera which he had sent to the last exhibition of the Society. He said, that the only opening was that of the front into the camera itself, and this gave great security against the admission of light, and consequent fogging of the plate. The plates were contained in light brass frames, which were shifted after exposure from the front to the back of the box, by being taken hold of through the substance of a bag of black opaque material. This bag being laid on the top of the frames, and held in place by a door or lid, formed a capital packing.

A Member enquired whether it was not objectionable to add so much weight to the camera when in use; and

T. SAMUELS replied that he considered it advantageous, as steadying the camera. He preferred to make the camera itself as light as he could, and to put the weight thus saved into the lens. The top of the tripod also should be large.

W. ENGLAND agreed that it was a good plan to have the top of the stand large.

T. SAMUELS further said that he kept the screw which held the camera to the stand, screwed into the camera, and did not take it out, but had a slot cut in the tripod top through which the head of the screw was passed; then it was slipped to the centre and tightened.

W. T. WILKINSON mentioned that he had been much pleased

with the method of stripping gelatine films from the glass, recently described by H. J. Burton. The plate was coated with thick collodion, and as soon as set, immersed in a solution of one drachm of hydrofluoric acid in ten ounces of water, used in a *papier maché* dish. The film very soon left the plate, and was then hung up to dry.

A. COWEN said that that was Plener's plan.

Various votes of thanks were proposed by the Chairman and declared to be carried, and the meeting then adjourned.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE usual weekly meeting was held on the 19th inst.; C. H. COOKE occupied the chair.

Two bromide print were shown by G. T. Grammer from the same negative, printed about 6 to 8 inches from an oil lamp. The reversed print had been printed with the non-coated side next to the film of the negative by accident. The second print was from the proper side of the paper. Both were good pictures.

A. COWAN advocated using a well-restrained developer and long exposures for bromide printing.

A. HADDON exhibited some results of Capt. Pizzighelli's new platinotype process. He had found the printing to be exceedingly slow, from ten to twelve times longer than the ordinary platinotype paper. He had produced a sepia tone by using bichloride of mercury; he sensitized the paper with a sponge.

The CHAIRMAN considered the results very fine; this opinion was expressed by other members.

W. H. HARRISON had given a great deal of attention to the working of sodio ferric oxalate processes; the chief objections at present was slow printing, which, in dull weather, would militate against its employment.

L. MEDLAND exhibited one of Newman's shutters, to which the maker had recently added a compensating balance to prevent a perceptible shake which had been found to exist; the shutter would now give exposures of  $\frac{1}{100}$  of a second.

#### NORTH LONDON PHOTOGRAPHIC SOCIETY.

AN ordinary meeting was held at Myddleton Hall, Islington, on April 17, A. MACKIE occupying the chair till the arrival of the President.

Mr. Fenwick was elected a member.

Messrs. Clifton, Coventon, and Hiscock, were appointed as a deputation to express the views of the members on the question of the management of photographic exhibitions at a representative meeting convened by the Camera Club for that purpose.

F. W. HART showed some excellent flash-light interiors taken by Mr. Taverner; in one of the examples three lamps had been used, in the other only one.

THE PRESIDENT showed some remarkable instantaneous pictures by Mr. Stettinius, a Cincinnati amateur; one of these, showing a two and a half inch figure of a diver in mid air, attracting much attention.

W. BISHOP exhibited specimens of the transferotype process on opal.

Rev. E. HEALEY showed specimen negatives on Fry's films, and called special attention to their toughness of elasticity.

E. CLIFTON then read a paper on "The Early History of Photography on Glass."

THE PRESIDENT said that the paper they had just heard was very interesting, and was, moreover, a very appropriate one to read in that room, for in time gone by many good processes had been brought forward on that spot by the old Society. In this connexion he particularly recollected a modification of the collodio-albumen process introduced by Dr. Ryley, and known as the hot water process. It was very simple, and he would recommend any who still dabbled in both processes to give it a trial. The plate only required sensitising in the ordinary way, washing, and treating with a solution made thus:—

Albumen ... ..	1 ounce
Water ... ..	4 ounces
Liquid ammonia ... ..	20 drops

The plate was slightly drained, and dropped into boiling water; it was immediately withdrawn, and the heat of the plate rapidly dried it. The process was excellent for transparencies, and, although originally devised for acid pyro development, worked excellently and much more quickly with the ordinary alkaline



developer. In the plain albumen process, much greater rapidity than that mentioned by Mr. Clifton could be obtained if the film was kept permeable with honey or the like.

Rev. E. HEALY showed two negatives taken in 1857 on Hill Norris plates. He said that 9 by 7 plates then cost a guinea a dozen. He showed a number of old collodion negatives, and pointed out the different colour of images obtained with different makes of collodion.

J. B. PAYNE (of Newcastle-on-Tyne) said that it might surprise many present to hear that there was still a very large demand for collodion. It was, however, mostly used for copying and for export. Collodion was very rarely sold by his firm (Mawson and Swan) in less than Winchester or gallons. He was very glad to have heard credit given to Daguerre for his earlier researches. Modern photographers were rather apt to forget the man who first gave the world a practical process for obtaining photographic portraits.

W. J. PEARCE gave some interesting details of a case in which Daguerre's English patent was successfully contested by a Plymouth photographer.

R. L. Allen and J. Oakley exhibited well-preserved specimens of collodion positive portraits, and a discussion was commenced on this process. Owing to the lateness of the hour, it was, however, decided to adjourn the discussion till the next meeting, on May 1st, when F. W. Hart promised to demonstrate the taking and finishing of positive collodion portraits on glass by the magnesium light.

#### DUKINFIELD PHOTOGRAPHIC SOCIETY.

THE first ordinary general meeting was held on April 17th, J. T. LEES in the chair. The rules were discussed and adopted, and the following officers were then elected:—

*President*—John Ashworth.

*Vice-Presidents*—J. Hall Brooks, T. Hodgett Gordon, B.A., and John T. Lees.

*Hon. Treasurer*—Harrison Veevers, C.E.

*Hon. Secretary*—W. H. Shirley, Commercial Buildings, Dukinfield.

*Committee*—W. Jenkinson, G. Robinson, J. Leech, J. T. Lambert, C. W. Thompson, and J. Winterbottom.

*Auditors*—G. H. Dean, and J. H. Snowdon.

It was decided to have an outdoor excursion to Romiley on the 28th April. Meetings are held on the third Tuesday in each month at 7:30 p.m.

#### SOUTHPORT PHOTOGRAPHIC SOCIETY.

A PUBLIC meeting was held on the 17th inst., in the rooms of the Young Men's Christian Association. W. MARSDEN occupied the chair. There was a good attendance of professional and amateur photographers.

The CHAIRMAN explained that a small but successful society, in connection with the Y.M.C.A., had been in existence for some time, but it having been repeatedly brought to their notice that a public society was an acknowledged want, there being a great number of ladies and gentlemen in the district who practise the art, and judging from the interest manifested by those to whom it had been mentioned that such a society would be successful, they had called a meeting to consider the advisability of forming a Photographic Society for Southport.

After some discussion, it was unanimously resolved that a society, open to ladies and gentlemen, professional or amateur, be formed, and that the subscription be five shillings per annum, and that it shall meet every four weeks on Monday evenings. The following officers were elected:—

*President*—Benjamin Wyles.

*Vice-Presidents*—Dr. Monk and E. S. Harper.

*Treasurer*—H. J. Heaton.

*Secretary*—W. Marsden, 35A, Arbour Street.

*Assistant Secretary*—Albert Bedford.

*Council*—B. Boothroyd, J. B. Walker, D. G. Wilkinson, J. S. Dicken, and T. Peach.

It was also resolved that it take over the effects of the Y.M.C.A. Photographic Society at the price paid for them. It is intended to have a dark room in connection with the Society, which shall be also available for the use of visitors to the town at a small charge.

The first ordinary meeting will be held on May 7th, when the President will give an inaugural address dealing with the best conditions for successful landscape photography.

## Talk in the Studio.

SCIENCE AND ART.—A correspondent of the *Scientific News* says:—"A contemporary of yours makes the following attempt to confuse science and art. He says:—'The line of separation between science and art is more apparent than real. A student who draws a carved mantelpiece at a distance of twelve feet is an art student; the youth who walks up to it and draws it by measurement is a science student. The student who critically examines the skeleton in the art school, preparatory to drawing from the life, is an art student; but he who studies it as the framework of the living form, with bones, muscles, and tissues, and whose powers of drawing at best will result only in a feeble sketch, is a student in the science subject of physiology.' I would say that science has no concern with carved mantelpieces. Further, the man who studies skeletons is a morphologist, not a physiologist. He does not necessarily make a feeble sketch, or any kind of sketch of his specimens. If he does so it is merely something collateral and incidental, not his primary object. It is a pity that your contemporary has not met with the distinctive characters of science and art as laid down by Mr. Crookes, F.R.S. 'Science,' he writes, 'sees phenomena, records them, traces their laws, and questions nature, her sole object being truth. Where completely successful she attains prevision. Art, on the contrary, seeks to produce, to modify, or to destroy. Her sphere is action. She aims at power and enjoyment, and when completely successful she creates.'"

PHOTOGRAPHIC CLUB.—The subject for discussion on May 2nd will be "The Restoration of Photographs."

## To Correspondents.

\* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.," while Advertisements and Business letters should be forwarded to "PIPER AND CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

W. R. KENNAN.—The details of the collodio-albumen process are to be found in back volumes of the PHOTOGRAPHIC NEWS, and in a pamphlet published by Mudd, of Manchester.

INKSCICAS.—Any optician can construct such a lens for you, but we do not see what will be the advantage of having it made.

E. D.—If sent, it will be noticed in the ordinary course. The communication regarding the advertisement has been handed over to the publishers.

G. C.—1. Back the plate with Brunswick black. 2. An objective of the rapid rectilinear or symmetrical type answers well. 3. Contact printing, whenever a copy of the same size is required. 4. You can obtain everything in New York, from Anthony and Co., or the Scovill Company.

F. H. B.—Thanks for the newspaper cutting, which is drivel of such a low type as hardly to be worth quoting, even on the chance of raising a snifle.

TYRO.—1. Take the ordinary plates, and be careful to guard against over-exposure, as one accustomed to a Northern county is almost certain to under-estimate the intensity of the light. 2. To obtain more equally sharp definition all over the plate. 3. Not absolutely necessary, but it is often a convenience to use it.

J. R. B.—1. We think you cannot do it legally, but it is a very rare thing for the law to be enforced. 2. The above remark only applies to poisons.

READER.—A mixture of starch paste and lamp black, applied with a small piece of sponge, answers well. Avoid using too much.

C. R.—Even though you may be content to rest your reputation on the sending out of gelatino-bromide prints, you may as well leave them in the hypo longer, and wash them thoroughly. Those you send are neither fixed nor washed.

G. BUNN.—The illustrations are, we believe, lithographs, being doubtless drawn on the stones by an artist. Blocks by the Meisenbach Company, or by the Photo. Printing Co., of 62, Basinghall Street, will, if carefully printed, give satisfactory results. Your enclosure has been re-posted to you.

## The Photographic News.

### SUBSCRIPTIONS.

Including Postage to any part of the United Kingdom:—  
Yearly ... 15s. 0d | Half-Yearly... 7s. 8d. | Quarterly ... 3s. 10d  
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# THE PHOTOGRAPHIC NEWS.

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## ACCIDENTAL DESTRUCTION OF NEGATIVES.

### AN IMPORTANT LEGAL POINT RAISED.

It is often a subject of anxiety with photographers how to get the subsidiary work done, by which we mean retouching, printing, enlarging, &c. So great is the anxiety as to the preservation of negatives when out of the proprietor's hands, that the practice of sending out negatives even for retouching has been almost abandoned, and outdoor retouchers are feeling the loss of the work.

It is, however, absolutely necessary, when a large number of prints is desired, to get these done outside, and especially when the staff of printers is not equal to the production of the various styles and methods in vogue.

Under these circumstances it behoves photographers, no less than printers, to be especially careful that the negative is not injured while away from the studio. An interesting law case, in which the question of liability for damage to a negative was decided, has just been tried at Wandsworth County Court. We append report.

WANDSWORTH COUNTY COURT, *Tuesday, 1st May, 1888.*  
Debenham and Gabell v. Morgan and Kidd.

Before His Honour Judge Holroyd.

This was an action brought by Messrs. Debenham and Gabell, of 158, Regent Street, Photographers, against Messrs. Morgan and Kidd, proprietors of the Argentic Gelatino-Bromide Works, Kew Foot Road, Richmond, to recover damages for the breakage of a negative photograph entrusted to the defendants by the plaintiffs for the purpose of printing by their process. Mr. F. Safford, instructed by Mr. S. J. Debenham, of 35, Southampton Buildings, Holborn, was counsel for the plaintiff. Mr. Spokes, instructed by Mr. Montague Hawkins, of 115, Leadenhall Street, for the defendants. The case had been intended for trial by a jury, but, by consent of the parties, the jury were dispensed with, and the case heard by the Judge alone.

It appeared that, in November last, the plaintiffs took a Jubilee group, 10 by 15, representing 130 workpeople in the employ of Messrs Brooks Bros., Rathbone Place, of which a gross of copies were ordered at 3s. each. The plaintiffs printed four-and-a-half dozen, and sent the negative on January last to the defendants, requesting a proof. The negative was sent packed, according to the suggestion of defendants, in a cardboard box, by Parcels Post. It was returned on Jan. 26th, wrapped in paper only, by a messenger in the employ of the defendants, and had been broken on the way. The plaintiffs afterwards took a negative from one of the prints, and supplied four-and-a-half dozen more from this, but the customers declined to complete the order, being dissatisfied with these.

The action was therefore brought to recover £5 8s. for the loss of the three dozen prints, and £5 5s. the value of the negative.

Counsel, in opening the case, stated the facts, and read some letters from the defendants to the plaintiff and their solicitor, a correspondence having taken place prior to the commencement of the proceedings. In one of these the defendants said, in reply to the plaintiffs' solicitor: "We cannot admit there was any negligence on our part while we had care of this negative; on the contrary, it was treated with every care while on these premises, and with more than usual care when being returned, as it was sent by hand instead of being despatched like the majority of negatives, to take its chance by post or carrier. It was most unfortunate that our manager should have had an accident with it on his way to your clients' premises; but the accident was such as might occur to a careful person. The negative was sent home on an exceptionally windy day, and as our messenger came from the railway station carrying the negative in his hand, a sudden gust of wind blew a print he was carrying under his arm against the negative and cracked it. In spite of this occurrence we consider we were returning the negative in a safer way than by post or carrier. We cannot imagine any safer plan of returning a negative than by sending it by hand by our own experienced messenger. A photographic negative is an extremely fragile thing, and considerable value is sometimes set on these. Considering the large number we have pass through our hands, and the risk of damage, it would be obviously impossible for us to carry on our business if responsible for accidental damage. In our price list, copy of which we enclose, you will see we refuse any responsibility of the kind, and our customers send us their negatives with this understanding. We must, therefore, while greatly regretting the accident, decline to enter into any question of compensation."

Mrs. Gabell deposed that she had sent the negative to the defendant packed in a cardboard box, and it was returned with the proof on 26th January, broken into several pieces, as produced. She said the messenger told her he could not help it, as he was overloaded with parcels, and dropped the negative; and either this or something else must have been dropped. She stated the other facts opened by Counsel, and was cross-examined. She was asked if the stains on the negative, and which showed on the print, could be got out, and was of opinion this could be done; and her evidence as to the statement of the messenger was disputed.

The defendants' counsel called several witnesses, among them Mr. Kidd, one of the defendants, to prove that it was customary to return negatives to photographers in the way described, and that the stains referred to could not be removed, so that the prints which would have been made from the negative would have been defective; and also sought to prove that a prospectus or price list with the clause referred to in the letter had been sent to plaintiffs before the transaction.



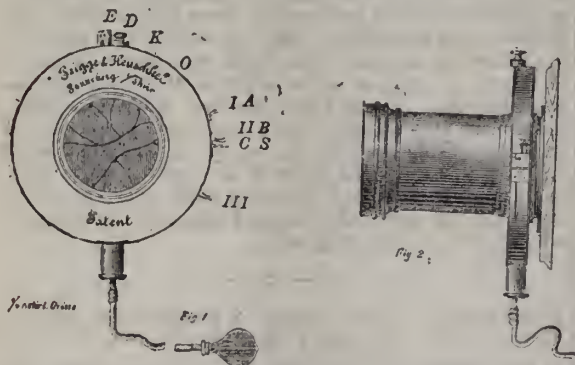
His Honour held that the defendants were not protected or exonerated from damages resulting from such an accident, notwithstanding the paragraph in the prospectus or price list, and gave a verdict for the plaintiffs; damages £6.

### SOME CONTINENTAL APPARATUS.

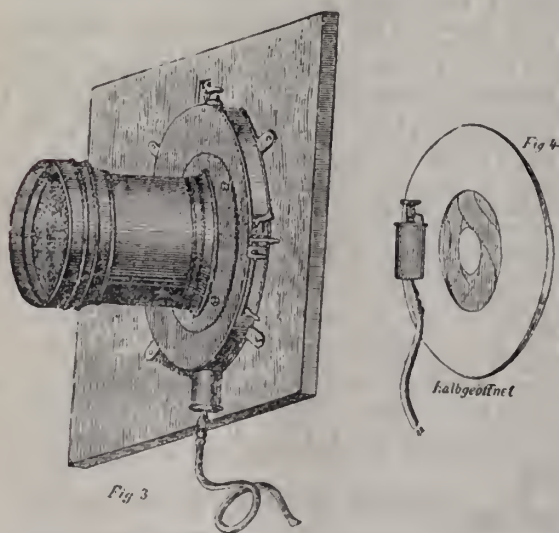
#### PRIGGE AND HENSCHKE'S ADJUSTABLE INSTANTANEOUS SHUTTER.

This shutter, according to the *Photographische Correspondenz*, from which we translate the following description, is distinguished by its great speed, entire freedom from jarring, central lighting with full opening of the objective, the wide limits of speed to which it may be adjusted to work (from the smaller fraction of a second up to several minutes), ease of manipulation, and convenience of form. A further advantage claimed is, that although set for a given length of exposure, this may be suddenly cut short at any point by a second pressure on the india-rubber ball which starts the exposure, so that in case of movement on the part of the subject, or a sudden increase of brightness of the light, the operator's judgment may come in to supersede the first formed intention. On these accounts the shutter should be universally applicable to studio as well as outdoor work.

The shutter is most advantageously used behind the



lens, or in the place of the diaphragm. Since the opening is always nearly circular, and the plates of metal forming



the shutter can be set to open to any given size, the use of diaphragms is in this case superfluous.

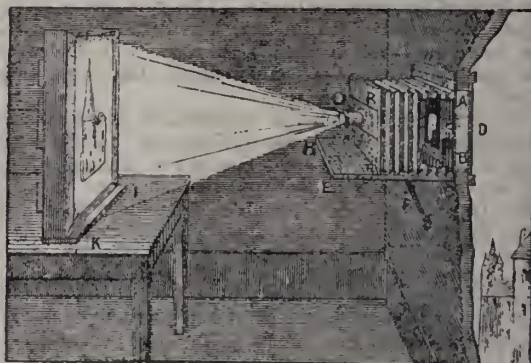
The manipulation of the apparatus will be understood from the following cuts and description:—

To set the shutter open for focussing, the arms I and II are pressed against the trigger S. When focussed the arm III is also brought up to the trigger, and the shutter is then ready to be released by a pressure upon the india-rubber ball.

Setting the shutter for timed exposures is accomplished by turning the head of the screw D, whereby the accompanying index E is moved backwards or forwards along the circumference of the circular plate. The shortest exposure is obtained when the index is at K, and the longest when it is farthest in the opposite direction. A longer exposure than that which is allowed by the scale may be given by disconnecting the latter.

#### ENLARGING METHOD FOR AMATEURS.

*L'Amateur Photographe*, of Paris, has an article on a simple enlarging method, which is recommended to amateurs as an apparatus that can be installed in the dark room itself at a trifling cost. The author insists, in the first place, that it is necessary to assure one's self that there are no chinks in the walls or partitions of the dark room which will admit white light, and so compromise the success of the operations. In order to render the obscurity more complete, all the squares of the window lighting the laboratory are covered. An aperture is cut in a wall about 9 inches by 12. This supposes that the largest negative from which it is intended to enlarge is not greater than about half an inch smaller each way than



the above dimensions. This aperture A B in the figure is covered outside by a stout ground glass D, and must face the north.

If this mode of proceeding presents too great a difficulty, the window of the room is boarded up, leaving a space of suitable dimensions, in which the coloured glass of the laboratory is of course replaced by ground glass.

When a north aspect is not obtainable, there must be a screen placed outside, by the aid of which the ground glass may be protected from the direct rays of the sun.

When it is desired to operate with artificial light the partition of the laboratory is pierced with an opening leading to an adjoining room, and the apparatus is otherwise arranged as for daylight, but a paraffin lamp is placed at a certain distance from the ground glass, and is furnished with a reflector directed towards the opening A B. With this arrangement we may obtain as good enlargements as by daylight, but the exposure is considerably prolonged.

A board C E, two feet in length and ten inches broad, kept horizontally in position below the opening A B, by the aid of a stay F, serves to support the camera. It is ruled across with lines two-fifths of an inch apart, strictly parallel with the end H E.

The camera consists of two boards united by an ordinary bellows. One of these boards, P, has a rectangular opening into which fits a set of carriers for the differen



sized plates that it may be required to enlarge from. The other board R carries the lens, which is mounted upon the camera front, with which it is ordinarily used.

Any lens will serve, but a single lens suitably stopped down appears to give the best results. It is essentially necessary that the lens should cover sharply in the camera a plate at least as large as the negative to be enlarged.

The board P is held in place in the sides of the recess A B by hooks or turnbuttons, at an inch or two distant from the ground glass. The board or front R is free, and moves along its support, guided by angle pieces, to which are attached binding screws, by which it is fixed to any desired place. On a table of convenient height stands a large printing frame, of sufficient dimensions for the largest size that it is intended to produce. The glass of this frame must be free from air-bubbles and other defects which would cause blemishes to appear upon the enlargements.

If very large prints, without the use of the printing frame, be desired, a smooth drawing board may be employed, on which is fixed white paper for focussing upon. The pins should be near together to ensure perfect tension. The centre of the drawing board or printing frame must be opposite to and level with the opening O of the lens. It is necessary, in order to prevent distortion of the image, that the negative to be enlarged, the board carrying the lens, and the paper, should be rigorously parallel.

The image being sharply focussed, a wooden rule I K is fixed by two small nails on to the table in contact with the front of the pressure frame. This rule serves to show where to replace the frame, when the paper which has been used for focussing purposes is removed, and the gelatino-bromide of silver paper has been substituted.

To ascertain the time of exposure, it is well to place three bands of sensitive paper, separated by short intervals, in the printing frame. The lens is then uncovered, whilst two of the bands are shielded from the light. After (say) ten seconds, the light is allowed to fall also upon the second band, and after twenty seconds upon the third. After thirty seconds the lens is covered, and the three pieces of paper, of which the longest band has received thirty seconds' exposure, and the others twenty and ten seconds respectively, are developed. After this we operate with the whole sheet, and the indications which we have gleaned from the trial bands should assure an exact result.

If it is desired to develop prints of a size larger than that for which dishes are at hand, it may be accomplished in the following manner: A sheet of glass of the desired size is taken, and being thoroughly wetted under the tap the back of the sensitive paper is laid upon it and rapidly adheres thereto. The other side of the paper is then wetted, and the developing solution applied with a large badger brush. The solution must be spread rapidly, and air-bubbles chased away. This application is continued until development is complete, any excess of liquid being received in a cup and reapplied. With a smaller brush moistened with a 20 per cent. bromide solution, any parts of the image which it is desired to keep back may be restrained, and much harmony thereby imparted to the proofs.

All the solutions necessary for fixing and development may be applied in the same manner with brushes distinguished by marks, so as not to be used indiscriminately. Finally, the print has a lengthened washing under the tap.

#### THE NITRIC OXIDE AND CARBON DISULPHIDE LIGHT.

At a meeting of the Cleveland Club, Ohio, December 6th, 1887, Professor Bolton gave a demonstration of the light obtained by the well-known method of burning nitric oxide

and carbon disulphide. The things needed are some metallic copper, nitric acid, and carbon disulphide; an 8-ounce wide mouth bottle; a 2-quart jar, with very wide neck ground on the edge; an 8 by 10 or larger tray half-filled with water; a bent glass tube; thistle funnel, and a piece of rubber tubing. Through the cork of the bottle pass the thistle funnel to within  $\frac{1}{4}$  inch of the bottom. Also pass the small end of the bent tube through the cork only; now place two or more ounces of scrap copper in the bottle, insert the cork, place the free end of the rubber tubing under the jar, which has been filled with water, and inverted in the tray, a piece of plate glass having been placed over the jar after filling, the other end of the tubing having previously been attached to the bent tube.

Now, pour a mixture of nitric acid 1 ounce, water 1 dram through the thistle funnel; gas begins to evolve, passes over the bent tube, and displaces the water in the jar. When full, place the jar in an erect position, carefully keeping the glass plate over the mouth of the jar. Having filled a 30-minim pipette with carbon disulphide, slide the glass plate from the jar sufficiently, and inject its contents into the jar. The jar may then be shaken for a few minutes. It is now ready for ignition. Light a match, remove cover, and ignite the gas quickly.

The following is Professor Rusk's report on the gas flash light for portraiture:—"There is no question as to the actinic power of the new nitric oxygen light, but some experimenting will be necessary to place it in practical form for first-class portraiture. My best results were secured in the following manner. The light was placed about 12 feet from the subject at an angle of  $45^\circ$  to the side, and also elevation. Tissue screen one foot from light, and a mirror for side reflector which had been previously adjusted by using a lamp as source of illumination, the jar of gas taking the place of the lamp; ignite with a match, taking care not to hold the hand over the jar. A two-quart jar gives fully exposed plates by the method, a whole portrait lens being used.

#### A TYPICAL LAW CASE AFFECTING PHOTOGRAPHERS.

It not unfrequently happens that a photographer is employed to do exceptionally difficult work, or ordinary work under specially unfavourable conditions, and that the customer refuses to pay in consequence of the result not being to his satisfaction.

An instance of this sort is thus reported in the *Pembroke Dock and Tenby Gazette*, of April 19th last.

"*Claim for Photos.*—R. Symmonds, Tenby, v. Major Birtwhistle, Saundersfoot.—The claim was for £2 2s. for photographing a group of dogs. Plaintiff stated that he was instructed to go to Saundersfoot to photo the dogs, which he did, but had considerable difficulty in keeping them in position. Defendant maintained that he had trained the dogs properly for the Norwich Show, but plaintiff would insist in shifting them about. They were not correct negatives, as black and white dogs are shown, whereas his dogs were entirely black. He offered to pay for plaintiff going to Saundersfoot, but would not pay £2 2s. for such pictures. The pictures were put in, and His Honour pointed out to plaintiff that the dogs were plainly black and white. Plaintiff explained that the cause of that was due to the sun striking through the trees where he took them. His Honour said that it was open to anyone to reject a photo if it is not correct, and gave judgment for defendant, and no costs on either side."

With reference to this matter Mr. Symonds writes as follows:—

"Tenby, May 1st, 1888.

"I enclose for the benefit of my brother photographers a copy of a photographic group of spaniels, together with



newspaper cutting of County Court proceedings. Kindly give your opinion of the photograph enclosed. . . . Was the judge a good judge of a photograph, Mr. Editor? Sandersfoot is  $3\frac{1}{2}$  miles from Tenby; I took my son with me, closed the studio, had a hot, tiring walk, and a very difficult job in getting the dogs still in a suitable light. The kennel was under trees where the sun came through in patches. The major had rigged up a kind of platform on which he wished them to be photographed. I thought I had succeeded remarkably well, considering the difficulty I had to contend with. It seems a hard case when one tries his best to oblige a customer at a short notice. He only came for me the morning of the 9th of June, when we were very busy printing views. I think we ought in cases of work from home have some sort of understanding as to the time lost. . . ."

It is pretty clear that the photographer in this case was compelled to do his work while subject to specially difficult conditions, and from his letter we gather that the customer himself so far interfered in the matter of posing as to introduce more difficulty than there need otherwise have been. Judging from the generally excellent character of the photographic work in the case of the photograph sent to us, we take it that, had the photographer been able to pose the dogs in the studio, the result would have been a photograph more to the taste of Major Birtwhistle, although, perhaps, not nearly so valuable from the point of view of an art student. The play of light on the dogs is really curious and interesting, and we take it the judge must be a man who never really looked at a picture, to suppose that the light streams—which play alike on dogs and on accessories—make the dogs look as if they were black and white animals.

We may assume that Major Birtwhistle honestly thinks that the photographer, in this instance, has not shown reasonable skill in his work; but if he will take the trouble to inform himself—and it is clearly his duty to do this—we think he will find that he ought to pay the sum demanded.

#### REGULATIONS FOR PHOTOGRAPHIC EXHIBITIONS.

BY THE REV. F. C. LAMBERT.\*

WHEN I suggested, a few weeks ago, that the programme of the conference (now just over) should contain a paper on the "Rules and Regulations of Exhibitions," I little thought that the subject was destined so soon to become a warm subject in the Photographic Press. I think I may take it for granted, then, that the present state of affairs in this direction does not meet with an utterly unanimous support from photographers generally. Therefore, I have no hesitation in asking photographers and all interested in art (photographic or otherwise) to contribute, by their careful consideration, towards the attainment of something more like a general uniformity in this matter. May I first suggest two axioms which seem to me fundamental, and not to be lost sight of for a moment?

Firstly. The outside non-photographic public must, to a very great extent, depend upon what they see in photographic exhibitions as a basis upon which to form their ideas of the (1) aims and (2) capabilities of photography. Their ideas so formed must, to some extent, react upon photography generally.

Secondly. Photographers will, of necessity, regulate their aims more or less in accordance with those works which receive most attention on the part of either the judge or the general public, and will modify and regulate their work (perhaps unconsciously) in accordance with the regulations, &c., of these exhibitions.

Therefore, I argue that the future of photography is, to a great extent, dependent upon photographic exhibitions. Thus, while keeping these points in view, there is yet one other general consideration which should also be kept in mind, viz., that it is desirable, as far as possible, to exclude the commercial spirit, and so frame the conditions, so far as may be, so that the struggling poor worker may have, in all respects, equal advantages with his more prosperous neighbour.

The following points are those which from time to time have

suggested themselves to me as worthy of consideration, with view of something like reform and general uniformity.

That as long as possible a notice of an intended exhibition be given, so that those at a distance may have time to prepare, and also for those who only have leisure at certain times of the year.

2. That the names of the judges be announced some considerable time before the pictures be sent in. Everyone who has had any personal experience of any form of examination knows how much personal equation belongs to the examiner, and if this be so in a set subject, how much more must it be so in an open subject, such as art (*quot homines tot sententie* here, if any, surely). Consider for a few moments the difference it would make in the selection of pictures for two exhibitions if one knew that in the first they would be judged according to the fuzzy (sometimes called atmospheric) school; in the other, according to the microscopic definition school.

3. As regards the classification of pictures, I have yet to see anything like a satisfactory one; but, at present, my feeling is that the worst possible is that of classifying by superficial area (I wonder if it has ever occurred to anyone to classify by weight, frame included?). I have yet to learn in what way quantity can be a substitute for quality. Surely it is better to do small and good than bad and big! And if it be answered that it is more difficult to develop a plate 6 ft. by 4 ft. than one 6 in. by 4 in., I yet fail to see any special credit to the man who develops with a bucket rather than an ounce measure; the difference is one rather of expense and manual labour than of brains and artistic power and skill. Anyhow, I think a big picture should only have precedence over a small one when they are equal in every other respect. In one programme I saw Class X. "for whole plates or over," and Class Y., "for half-plate or under." I have often wondered why the 8 by 5 man was so utterly suppressed—excommunicated. Sizes between half-plate and whole-plate evidently have some inherent evil connected with them. This should be a warning to any intending purchaser of that size of camera.

Surely subject is a better basis than size for attempting classification, if it must be attempted; but the broader the lines the better. Why not be content with indoor and outdoor, without sub-dividing into landscape and seascape, &c., where many pictures must partake equally of the nature of both, and perhaps "figure," with a little "architecture" included?

3. As regards process, it would seem desirable to use process as a means of sub-classification. To my mind, nothing seems more unjust (because impossible) than to compare two pictures from different negatives in different processes. However, can it be possible to compare, say, an oil portrait, a water-colour flower subject, a platinotype interior, an engraving seascape, and a figure composition silver print? One might as well compare a flute, violin, and voice. It has become a fashion (almost a mania) to regard anything in black and white as more artistic *per se* than in other tones; but surely this is false; there is no art or artistic quality in any one colour or tint, but the art is rather in placing that one tint in the right place. Was it not Raphael who let out the whole secret of painting when he said it consisted in putting the right colour in the right place? I think it is a serious step in the wrong direction to elevate any one process or tint, colour, medium, tone on to a pedestal, and I realised this very strongly when I made a rough analysis of the pictures, processes, and awards in the recent Pall Mall Exhibition, and drew the conclusion that "black and big" was the ruling idea in the "mind judgmatial."

4. Another point which should be clearly settled once and for all is, that the work shown should bear the name of the person or persons who really produced the picture; and that where a picture is the joint production, the various names of the producers should all appear. By production of picture, I should include all operations from making the exposure—*i.e.*, either actually making the exposure, or assigning the time of exposure in such cases, or when the operation is in the picture or is out of actual reach of the lens; development, and all operations essential to the production of the negative, including retouching. This, perhaps, will not meet with the approval of some professional operators. Printing, toning, fixing, mounting, spotting, burnishing, enamelling—in fact, all operations up to the production of the picture as shown—not including framing, of course. It is manifestly unjust that all the credit should be assigned to the so-called operator, when frequently much of the real credit is due to the retoucher and printing dodger—or dodging printer. What is to prevent an inferior operator getting a first-class retoucher to work up one special negative, gain a notoriety, and

\* A paper read before the Camera Club.



ever after pose as a prize-taker by some one else's work? If the labourer is worthy of his hire, he is surely worthy of recognition.

5. It would be desirable to limit the number of pictures shown by any one person or firm, with a view to finding good hanging space for as many worthy pictures from different workers, rather than a number from one artist. The actual number would depend upon the space at the disposal of the hanging committee. I think I may take it for granted that no picture with a frame other than rectangular should be admitted. Not only should the actual number of pictures in frame be limited, for except in a special case of a series of connected scenes, it is desirable to discourage, if not prohibit, the mixing of disconnected pictures in one frame; but, also, it would seem desirable to limit the actual wall space; this would, of course, as above, depend on the available, or rather rationally available, wall-space attainable.

This leads on to the actual hanging of pictures. Again, I think, as spectators and exhibitors, we should all infinitely prefer to have our work rejected rather than skied or floored. Excepting at the not very probable request of the exhibitor, I have come to the conclusion (after carefully observing the effect of height in various picture galleries), that, except in very unusual cases, no picture should be hung with its middle line higher than seven feet or lower than two feet from the floor.

The method of appointing a hanging committee is at present to me an unsolved problem; but, any way, I think that no short-sighted person can be considered a fit person to select or arrange pictures for the general sight (by short sight I should say one who cannot read with the naked eye the daily press at ten inches). He should also be thick-skinned: for, in any case, it is not unlikely he may require that qualification. As regards arranging of pictures, I fully agree with the general and inherited custom of keeping oil pictures in one room and water-colour in another, and not mixing them; and I also feel that more, much more, is lost than gained (if anything beyond novelty is gained) by mixing pictures by different processes. This, no doubt, like many things in art, is a matter of education, or the neglect of it, but we prefer to call it a matter of taste; but it would be interesting to know on what grounds an arrangement is made in a public show which is contrary to the custom of most of us in our private houses. This much may be said, that putting side by side pictures of the same general tone (by same or kindred process) would assist us materially in making non-odorous comparisons.

6. With regard to the number of pictures to form a series, I feel that it should be left to the exhibitor to say how many his series should consist of; it is an undesirable thing to limit a man to any fixed number—six or twelve is the usual number—but it would be desirable that the committee should suggest that exhibitors be invited to limit themselves; say, a series to consist of not less than three or more than twelve pictures. This would also apply to lantern slides and microscopic specimens.

7. The question of charging for each picture, frame, or entrance fee: all seem inferior to charging for actual wall space. This latter seems the most just, but at the same time I think it would be worth while asking the question whether a modified scale should be adopted, somewhat as follows; suppose: first six feet at 6d. per square foot, second six at 1s., third at 1s. 6d., and so on; enlargement at half this rate. This would deter men from seeking size or number of frames rather than quality; but it may be thought to fall the more heavily on those using large sizes, to which it may be replied that it is a likely presumption that the man who works large sizes can better afford extra cost than he who uses the smaller sizes. However, whether this idea finds favour or not, I think the plan of charging for space is more just than for number of frames.

Before passing on to the "warmer corner" of the subject—the medal question—there are one or two other matters which may, perhaps, be worth while suggesting:—

(a) That any enlargement be accompanied by a direct print.

(b) The focal length of lens be stated.

(c) It would be some incentive to original work if the committee gave out a list of a few suggested subjects—quotations, say, from—

*Hamlet.* Give thy thoughts no tongue.

*Richard III.* When clouds appear, wise men put on their cloaks.

*Richard II.* The setting sun and music at the close, as the last taste of sweets is sweetest last.

*Othello.* I do perceive here a divided duty.

*Macbeth.* Memory, the wanderer of the brain.

Or, again, "Solitude," "A Storm," "Springtime," &c.

And now as regards judges and awards. I think it would be

conducive to the general well-being of photography in the future, and the peace of mind of photographers in the present, if a few simple principles were set forth and generally agreed upon.

First, then, that few, if any, men excel in more than one thing; but that those who do not excel in any one thing are apt, if not extremely likely, to have considerable—what shall I call it?—prejudice has, in most minds, a bad meaning—let us use the mathematical term, "personal equation." Therefore, while it is desirable to get all the good from a specialist, it is, at the same time, desirable to eliminate his personal equation. This, obviously, can only be done by having more than one judge.

Now, since there are three ways in which a picture (a work of art generally) may be viewed, it would seem desirable that we should have, at least, three judges, each of which being supposed to have special knowledge of one of the three points or aspects of a work of art, but also some general knowledge of the other two sides of the question. I may, perhaps, be permitted to explain briefly what I refer to by these three aspects of a work of art.

Firstly and lowest, the mechanical handling of the materials, the craft—technical excellence we generally say in photography—and the photographer is not altogether unknown whose highest aim is the production of a crisp, plucky, sparkling negative, whether it be of a row of telegraph posts or his pretty cousin.

Secondly. The arrangement not only of the material, but of the parts of the picture; in fact, not what is usually called composition, treatment, *chiaroscuro*.

Thirdly. The true essential soul of a work of art, the poetry of the conception, the idea, the solution, personality. It is the general absence of this third, but far most important and essential part of a work of art, which so frequently justifies painters in saying that photography is not an art, because it has no soul, spirit in it—a matter of optics and chemistry.

One may say these three parts are the products, respectively, of the body, the mind, the spirit of a man. The two first may be taught, learned by rules, but the third is beyond rule, like the poet, the artist *nascitur non fit*.

To return to our judges. Let us suppose we have found three good men and true; it would then seem highly desirable that each view separately the work submitted to them, and assign their mark for each of these three aspects; and the total of the nine sets—i.e., three sets of three judges—be the basis for recognition and award.

Further, I think it would be contributive to the peace of mind of exhibitors, that the judges should in no case know the name or address of the producer; therefore it would seem a good general rule that the title only be allowed to appear on the face of the pictures. Also, that the judges be requested to disregard the size, i.e., superficial area of the picture; and only in case of any two or more pictures gaining equal marks that quantity be allowed to tilt the scale.

Much has been said (and to my mind justly) against the hawking about of the same pictures from place to place, which have already gained recognition. It is pardonable and justifiable if a man who feels he has done his level best, and produced something which he feels proud of, having failed to obtain recognition by one set of judges, to try to find another set who see the merit he has tried to put into it; but once having had his work recognized, then it becomes something very like what we call in Cambridge pot-hunting, not to be satisfied with due recognition.

I should strongly urge that all pictures which are to receive awards, receive those awards on condition that they be entered as copyright, for future reference in case of dispute—and that a picture having obtained an award, be henceforth ineligible for competition, but not for exhibition—and in this case I think it might be reasonable to allow the exhibitor to put on it not only title, but his name, and name of and place where and date when it gained its honours. One can very easily see one possible result of permitting the same picture to be entered for competition a second time, and meeting with same judges, who would recognise an old friend, and having put him top of the tree once feel bound to put him there again. This, if only carried far enough, would save judges a lot of trouble; in fact, by keeping to the same exhibits it would be quite superfluous for the judges to inspect the pictures; a copy of the catalogue by post would enable them to tick off the pictures they always award medals to—each judge having his pet set of pictures. If a man can do good work once, let him do it again, and better the next time, in case jealousy should tempt some to say that it was more by luck than merit that he gained his honours.



As to the giving of medals or certificates, in whatever way it be thought desirable to recognise certain work, I think it highly desirable to do away with the competitive spirit—to have no first, second, and third—but let all the awards, whatever they may be, be all of the same kind. But, in any case, I think it would be desirable that a small printed card be given to those gaining recognition, setting forth the place or society, and date, title, author, size of picture, process, or other particulars, and signed by all the judges. This I think in any and every case, but also as to giving medals. I am strongly of opinion that giving them has had on the whole a good influence, stimulating many who would otherwise have worked in a desultory, aimless manner to putting forth their best efforts. No doubt the laxity or absence of clearly defined principles has to a great extent given rise to certain abuses regarding the giving of medals, and it is easy to see further abuses are likely to arise; especially in the present advertising age; but no great alarm need be felt if we do shortly find that A puffs his focussing cloth, and B his tripod-screw, and C his graduated measure on the strength of D having gained a medal. I think photographers may be safely left to estimate advertisements at their genuine worth. It is difficult to see in what way any individual or society can influence a trading firm using exhibitions or competitions as a part of their trading system, beyond suggesting that photographers as a body are desirous of elevating as well as popularising their art; yet I am disposed to hope that such firms would be willing to meet the expressed wishes and views of a body specially called together to consider such matters.

The retaining of exhibits, indiscriminate publication of works submitted, &c., are calculated to discourage many exhibitors. At the same time, amateurs must not forget that the London Stereoscopic Company were the first (I think I am right in saying the first) firm or society to organise a general amateur exhibition, and, therefore, are indebted to this firm.

I do not doubt that time and a little general agreement among photographers will adjust most, if not all, the defects of the present medal system; but I should imagine that the general vote of photographers will be in favour of continuing the giving of medals in place of money or other prizes; and it is difficult to see anything better in the shape of a non-perishable award of small intrinsic value than a silver medal. Therefore at present I cannot agree with the suggestion of a certain photographic oracle, that the time has arrived for abolishing the whole system of medal-giving. Because certain alleged abuses may have taken place in any system, is not of itself a sufficient reason that the system is wrong and should be abolished. The existence of drunkards is not a conclusive argument for universal teetotalism. And because medals may have been given somewhat too liberally, is short argument for non-giving. Why not let the number of awards depend on the number of men who attain a certain percentage of the theoretically possible maximum? Make it a qualifying, a pass examination rather than a competitive. The spirit of competition has been proved too often to be detrimental to the culture of originality, and an artist without originality is "nux cassa," and echo, copying plagiarist—no artist, only a workman.

#### CAMERA CLUB.

##### DISCUSSION ON THE SUBJECT OF REGULATIONS FOR PHOTOGRAPHIC EXHIBITIONS.

A SPECIAL meeting, to discuss this subject in relation to a paper by the REV. F. C. LAMBERT, and with a view to assist the attainment of greater uniformity in rules, was held at the Camera Club on Thursday, April 19th, Captain ABNEY presiding. A communication upon the subject, inviting representatives, or requesting replies on leading points, had been previously sent to every society in town and the provinces, and also to several leading exhibitors. This was well responded to, and a very representative company met together, including several of the leading members of each of the London societies, as well as other gentlemen interested in the subject:—Messrs. England, W. Cobb, S. G. B. Wollaston, J. Gale, W. T. Coventon, E. Clifton, E. T. Hiscocks, A. Mackie, J. B. Wellington, J. W. Zichnsdorf, J. J. Briginshaw, F. W. Cox, Cembrau, A. Pringle, J. C. Beck, F. Hollier, H. Bolden, H. Sturmey, J. R. Dallmeyer, Chas. W. Hastings, Peasgood, Mendelssohn, Hepburn, J. S. Grimshaw, and J. Traill Taylor. Important suggestions and categorical replies on the points raised came from provincial societies, and from some of the most prominent artist-photographers and exhibitors. These replies have been scheduled for convenience

of comparison, and will be found appended to this report. At the opening of the meeting, Captain ABNEY read the communication to the meeting, and the discussion was then opened by the Rev. C. Lambert (see p. 276).

After the paper had been read, Captain ABNEY said:—We first propose to discuss the point whether it is advisable to make awards at all, either of medals or other prizes, and then to follow on to the other points mentioned in the circular sent out.

Mr. PRINGLE said, supposing exhibitions are necessary, then he wanted to try to point out that, without awards of some kind or other, exhibitions would lose a great part of their value. What do we exhibit for? Partly for the general public, and partly for the photographic world. The general public is probably unable, to a great extent, to pick out the best work. That will probably be admitted at once. Without awards it will never be known what is considered the best work. I do not insist on a medal, further than I think it is necessary for the guidance of the public and the photographic world that some statement should be made as to which work is held to be the best.

Mr. DAVISON said Mr. Pringle had held that without medals exhibitions would lose a good deal of their value. He (Mr. Davison) did not see that there was any advantage to photography (and that he took to be the object of exhibitions chiefly) in the general public being informed as to which photograph a certain select body considered the best. He thought the mere admission to the exhibition ought to be considered the honour. In this way only the very best work would go before the public, and photography as an art would be held in higher estimation than at present. He was opposed to giving medals, not particularly because it was likely to cause heartburnings, but because the system generally seems to have had very bad results. Everything should be done to give dignity to photographic exhibitions and value to the awards, and, to attain this, only work with some art merit at least ought to be admitted. The aim of the meeting that evening ought to be to make suggestions for an exhibition of the highest class—an ideal exhibition—rather than to attempt to meet the necessities of local exhibitions, where, if an exhibition were decided upon, the special circumstances of each case had to be in record to make the enterprise a success.

Mr. PRINGLE agreed completely with Mr. Davison that the best award of all would be that of being hung at all.

Mr. BLANCHENSEE thought that if medals were not given to the best pictures in an exhibition, competitors would probably not send in such good work. He hardly thought that competitors would take the trouble of working up a picture to such a degree of perfection.

Mr. HEPBURN asked if it were not considered that if all the pictures were limited to the best work, there would hardly be any exhibition at all.

Mr. ENGLAND was very strongly himself in favour of medals being offered, but he was certainly in favour of their being very much more restricted than they had been. Unless pictures attained a certain standard they should not receive medals. Very competent judges should be appointed, and work which did not rise to a certain standard should not be eligible. Exhibitions had advanced photography and brought it to its present state. The status of exhibitions had been lowered by manufacturers offering medals for advertising purposes.

Mr. W. COBB thought the present state of photography rendered it undesirable that medals should be awarded. It was very different now from what it was ten or twelve years ago. He agreed with Mr. England that medals had done great service to photography. Recently, he thought the system of awarding medals had been a great mistake. There was one remark which Mr. Pringle made with regard to the outside public not being able to form a correct opinion as to the merits of the pictures. Years ago he thought that remark would have been much more applicable than at the present time. The general public had been educated to such an extent that they could spot a good picture as quickly as a photographer. The fact of pictures being admitted to exhibitions ought to be considered equivalent to the award of a medal. He considered the practice of medal-giving by commercial firms as a highly reprehensible one, and should be suppressed.

Mr. STURMEY thought we should consider the status of the exhibition. If we had a society which could give us a similar status to the Royal Academy, he thought we should all value our pictures being hung there more than a medal; but not so in regard to provincial exhibitions, where, he thought, medals should be given.

Mr. HOLLYER: Giving medals has a very bad effect on the art



side of photography, as it stimulates imitation, and chokes off originality.

To gain the sense of the meeting, the motion was then put as follows:—Resolution No. 1. "Are awards generally desirable at photographic exhibitions?" On a count, it was found that there was a majority of about three to one in favour of awards being given.

The CHAIRMAN: The next proposal to be put is whether, granted awards are given, the exhibits should be divided into an art section, and a technical or scientific one.

Mr. W. COBB thought that photography ought to be looked upon as occupying two distinct positions, one which might be called the refining or art side, and the other instructive or educational. He thought that the exhibits should be divided into the art portion and the technical portion, and this would, of course, necessitate a very careful and separate selection of judges—those for the technical part, and those for the artistic side.

After further discussion it was moved:—Resolution No. 2. "That in the opinion of this meeting, at all photographic exhibitions there should be a division of the exhibits into two sections, the one artistic, the other scientific, to be judged by separate sets of judges." This was carried unanimously.

The next point agreed upon was:—Resolution No. 3. "That a limited number of specially selected judges is superior to a vote of the whole body of members of a society."

The CHAIRMAN then put forward the next head for discussion:

*"The Constitution of the Board of Judges: First for the Art Section."*

Mr. PRINGLE thought that by whatever means judges were elected, it was necessary that they should know something about the subject they are going to judge upon. A very important side of photography is the purely scientific side. It is very difficult to say who is a competent judge of art. He thought he was right in saying that no man was a judge of art. It was necessary in scientific photography that judges should have the required knowledge, and they should be accepted authorities on the subject they were going to judge. Jurors had been appointed to examine certain classes of photographs, of which they had been absolutely and completely more ignorant than he was of engineering. Judges ought not only to know their work, but they ought to be accepted authorities upon it. With regard to the number of artists that should be on a jury in a photographic competition, the best way to get the most art would be to have all artists on the jury; but all artists were not painters. The vast majority of painters were absolutely ignorant of the difficulties with which a photographer had to contend. He should hope that in all juries to decide as to artistic merit in photography there should be a certain amount of the photographic element present. Indeed, he thought it desirable on the whole that there should be a preponderance of photographers, and he would like to protest against an entire jury of painters. He should prefer a photographic jury of artist-men with, perhaps, a spice of purely painting-men on the jury to help them.

Mr. W. COBB: I think it is a fair assumption that artists at the present time are acquainted with the difficulties of photographers. Indeed, many of them take an active interest in photographic work.

Mr. BECK said: With reference to the selection of judges, it always appeared to him that one of their chief services was in pointing out what is to be admired in a photograph, and what is desirable to be copied. The question to be looked at was in what point was photography deficient. The point that should be specially laid stress upon was that the judges ought to be artists who would point out which was the right way. Technical excellence could be obtained in the present day fairly easily, and it was therefore of much less importance.

Mr. MACKIE said: For an artist to become great in the world he must be a faddist, and take one particular line. He thought, if we are to have artists, we should choose them as much as possible from men who are acquainted with photography.

Mr. DAVISON: In the art sections of exhibitions, men thoroughly able to decide as to the respective merits of the pictures ought to be selected. If awards are to be given, then surely the judges for the art section should be recognised artists only, just as in judging microscopical and astronomical work specialists only could decide. If there was a photographer who was a recognised artist, certainly have him as a judge; but the preponderance should consist of trained artists.

Mr. WELLINGTON quite agreed with Mr. Davison, and especially with Mr. Beck, that more importance should be placed on

the art side of the question than to the technical part. Medals should be given for technical work only in microscopical and astronomical work.

The subject having been further ventilated, the following resolution was proposed by Mr. PRINGLE:—"That in juries of limited number it is advisable that there should be a preponderance of photographers, admitted authorities on the artistic side of photography."

Mr. LAMBERT seconded the resolution, and said certainly it would be unfair to ask a collection of oil painters to judge a work on statuary. To judge a piece of statuary it was necessary to have an artist as well as a workman. He thought a jury ought to consist of a combination of artists as artists, and photographers as photographers.

Mr. DAVISON, in moving an amendment, said that the point he felt compelled to emphasise was this—that there were not half-a-dozen well known photographers who were actually competent to act in the capacity. The knowledge required to act with certainty could only be attained by long study and high culture, such as could only at present be secured by selecting well-known artists with trained minds. He moved as an amendment—"That in constituting any board of judges for the art section, preponderance should be given to artists recognised in the artistic world." Mr. WELLINGTON having seconded the amendment, and Mr. ZAEHNSDORF having disapproved, a vote was taken, when the amendment was negatived, and Mr. Pringle's resolution carried by a majority of about three to two.

Resolution No. 4: "That in juries of limited number it is advisable that there should be a preponderance of photographers, admitted authorities on the artistic side of photography."

The following resolution was then adopted unanimously:—Resolution No. 5: "That in the scientific section properly qualified scientists be appointed; and that, where necessary, experts be called in to adjudicate."

Mr. DAVISON brought forward the next point, and said it was very desirable that if medals were to be given at all, there should be some stricter limitation as to number of awards than was adopted at present. The cheapening of medals by there being given in such profusion and with want of discrimination, tended directly against the advancement of photography as an art. The financial success of an exhibition was made the only end, and to secure large numbers of entries, endless varieties of classes, with several awards in each, were devised. He thought this system was mischievous, and that there should be some limitation in the number of prizes given—say four per cent. of exhibitors. He thought, too, that this was the place to take exception to the giving of manufacturers' prizes in exhibitions.

Mr. LAMBERT agreed as to the undesirability of the system of manufacturers' prizes, and of making awards of no value by presenting them in undue profusion; but he thought it better to leave the matter wholly and absolutely in the hands of the judges as to how many should be given.

After further discussion, the following resolution was proposed by Mr. PRINGLE, seconded by W. COBB, and agreed to:—Resolution No. 6. "That this meeting deprecates both the making of indiscriminate and large number of awards, and the acceptance, by exhibition authorities, of prizes offered for the purposes of advertising."

Further, proposed by Mr. CLIFTON, and seconded by Mr. ENGLAND:—Resolution No. 7. "That the number of awards be left entirely to the judges, who should have full power to withhold, or to grant, as they thought fit."

Discussion was then given to the following points and resolutions, which were adopted:—

Proposed by W. COBB, and seconded by Mr. LAMBERT. No. 8. "That all awards should be of equal value."

Proposed by Mr. LAMBERT, seconded by Mr. MACKIE:—No. 9. "That as long a notice as possible be given of forthcoming exhibitions."

Proposed by Mr. LAMBERT, seconded by Mr. ENGLAND:—No. 10. "That the names of the judges should be published as soon as possible, and previous to the dates fixed for entry of pictures."

A suggestion from Mr. STURMEY, that a fixture-list of exhibitions, published and kept up in the photographic papers, would be of some service, was approved by the meeting.

At this point the meeting adjourned to Friday, April 27th, when the discussion was resumed, Mr. J. TRAILL TAYLOR acting as chairman.

(To be continued.)



## Notes.

Crammed with portraits—portraits of the largest and most offensive sort—is the Academy this year, and although in point of number the portraits may not be in excess of any former exhibition, they are, at any rate, far more obtrusive and overpowering.

The advanced school of our day insists very strongly that anything which is not made for the love of the work and its results can never be a work of art in the true sense; work done for payment—whether payment in cash, or its equivalent, present day popularity—bearing upon its face the black mark of meretriciousness. And this view was forcibly brought home to us in looking at this great display of large portraits, and thinking how few had been done for the sake of the doing.

We do not confidently assert that No. 687, "Lady Grantley," a portrait by Frederick Goodall, R.A., is the very worst thing in the exhibition, but we are inclined to regard it as such. It is mainly a painting of furniture, clothes, jewellery, and accessories.

In a fair competition, however, we think that No. 499, "The Right Hon. W. E. Gladstone, M.P." by Frank Holl, R.A., would run the last-mentioned canvas very close.

"Caught Napping," No. 831, by Nettie Huxley, is a delightful study of animal life, and among the landscape studies which the photographer will like to see, and may study with profit, are David Bates' "Forge Mill," No. 1,001, and No. 1,005, "The Plains of Arundel," by C. E. Johnson; this latter being a fine example of soft harmonious colouring, done with the view rather of representing Nature, than catching the eye of those who seek after the exaggerated.

As regards the Grosvenor Gallery, we may say, that those who visit it in the expectation of seeing bare walls, or a low average of work, will be much disappointed; the Gallery, in spite of the fact that Burne Jones, Walter Crane, and others have acted the part of naughty little school boys, who get in a pet and will not play, has in no way suffered as regards the general attractiveness of the collection.

Very dingy and funereal-looking is a photographic memento of a marriage, which we have received.

We take it that the mode of construction is this. A large card with headings in written imitation of printed letters, stating names of the principals with some particulars and opinions, was prepared beforehand. On the wedding day this was signed by all the company, and photographed in carte-de-visite size, the lines being light brown, and the ground a somewhat lighter brown.

The idea is, perhaps, a good one from the point of view of the professional photographer, but the result should be

clear and bright. Moreover, a few portraits might be introduced. Carte size is, perhaps, hardly large enough for this sort of thing.

An excellent effort in the direction of typical photographic portraiture comes to hand from Warwick Brookes, of 350, Oxford Road, Manchester, a series of four composite portraits on a cabinet card showing us the leading political types of the present day—*Government*, *Unionist*, *Gladstonian*, and *Home Rule*, each of these being represented by a composite of six photographs.

We should like to know, however, whether the various constituents of each composite are quite fairly proportioned. As to the "Government" composite we remark that Salisbury seems decidedly predominant, while the "Unionist" distinctly recalls John Bright; and the "Gladstonian" composite seems to us almost a portrait of Gladstone; again, the fusion of six Home Rulers certainly looks as if it were made up with too large a proportion of Parnell. In making a composite, it is not only important to give about equal exposure to each constituent, but also to see that the originals worked from are approximately equal in vigour.

The annual report of the French Photographic Society just published, furnishes in one respect an interesting comparison with that of the Photographic Society of Great Britain. In the English society the *Journal* forms the heaviest item of expense, and is a loss instead of being a gain to the exchequer. In the French Society the reverse is the case, the cost being 6,303 francs, while the receipts amount to 14,529. In fact, it forms the chief source of revenue, because the French Society has no exhibition to make good any shortcomings. Why the *Journal* of the Photographic Society is not a means of income is not for us to say.

In one item both societies agree—a certain percentage of members persist in being behindhand with their subscriptions. The treasurer of the English Society contents himself with simply recording the fact in the accounts; the treasurer of the French Society makes such an imploring and graceful appeal to the feelings of the recalcitrant members that it must almost tempt them to keep their money in their pockets in order to have the request made to them to pay up. After mentioning the increased expenses arising out of the necessity for moving to a larger room, the treasurer goes on to say that there are other sources of trouble which he only dares to whisper as a confidence. "It is embarrassing," he says, "to formulate it exactly, but nevertheless it must be done. Some of us are—how shall I express it?—indolent when they should pay our modest subscription. They do not refuse. Grand Dieu! no, but they draw back a little. They put off the matter, and tell the collector when he calls that they will send and pay the little account. Others say they have many other things to think about; others forget; and the end of the year comes, and your poor treasurer is forced to make this painful confession, while the expenses are in-



creasing fatally. Have some pity for him, and listen to him with an indulgent ear when he asks you, on the eve of entering upon considerable expenses relatively speaking, for much goodwill and a little more punctuality!" Who would resist such a pathetic appeal as this?

The effect of the new Merchandise Marks Act threatens to crop up in all sorts of unexpected places. A curious incident happened a few days ago. The publishers of Mr. and Mrs. Bancroft's *Reminiscences* were rushing the third edition of the popular book through the press, when they were stopped for want of the plates with which the work is illustrated. These plates are produced by Messrs. Boussod-Valadon's photogravure process, and are prepared in Paris. Unfortunately, the plates were marked "Bentley, London," and the stolid Custom House officials immediately pounced upon them as French goods marked as English! The consequence was that the third edition appears without the portraits. How long will it be before photography figures under the Act? There are a goodly number of French lenses which are passed off as English ones by disreputable houses. Perhaps a beginning might be made with them.

Some time ago we raised the question as to whether photographs sent to the United States were liable to the duty which is placed upon works of art. This question has just been settled. In July last, a number of the members of the Ancient and Honourable Artillery Company of Massachusetts were photographed in London on the occasion of the celebration of their anniversary. When the photographs arrived at Boston, the Collector of Customs assessed duty upon them, and application was made to the Treasury Department for remission of the duty on the ground that the photographs were intended as *souvenirs* of the visit to London, and were to be exhibited in the Armoury. The Department, however, was deaf to the appeal, and held that there was no provision of law exempting such articles from duty. The only satisfactory feature in this retrograde policy is that in America at least a photograph is a work of art.

The possibility of determining the correct time of the commencement and termination of an eclipse by means of photographs was referred to at the last meeting of the Royal Astronomical Society. The subject arose out of some photographs of the total eclipse of the moon exhibited by a member. The general opinion seemed to be that such measurements would be unreliable. The President pointed out that the photographic plate being insensitive to the red rays which pass through to the moon's surface in an eclipse, naturally there would be what might be called a personality in the photographic plate which would make computations derived from measurements of photographs hardly comparable with the results of observations by the eye. Mr. Common also remarked that it was quite possible by altering the exposure to alter the phase. He thought that unless photographs of an eclipse of the moon were taken on some rigid plan, and were compared with the eye observations, they would be quite valueless.

What rules may be finally adopted as to the admission of strangers to the House of Commons we do not know; but we are inclined to think if a condition were laid down that any person visiting the Strangers' Gallery should deposit his photograph to be retained, a valuable record would be secured. It is very clear, if any one obtained admission with a view to taking stock of the place for dynamiting, he would hesitate before depositing so dangerous a piece of evidence as the portrait of himself. There is no obstacle to this condition, for photographers abound, and the cost of a carte is small.

Our notice of an excellent little pamphlet on "Retouching made Easy," by J. Hubert, must stand over till next week.

## Patent Intelligence.

### Applications for Letters Patent.

- 5,536. STEPHEN JAMES HOLLIDAY, 32, Imperial Chambers, Colmore Row, Birmingham, for "Improvements in roller dark slides for photographic purposes."—April 14th, 1888.  
 5,545. FERDINAND HURTER and VERO CHARLES DRIFFIELD, Mount Pleasant, Appleton, Widnes, for "Improvements in instruments for calculating photographic exposures."—[Complete Specification.]—April 14th, 1888.  
 5,619. THOMAS RUDOLPH DALLMEYER and FRANCIS BEAUCHAMP, 115, Cannon Street, E.C., for "Improvements in photographic lens shutters."—April 16, 1888.  
 5,666. GEORGE LOWDON, 65, Reform Street, Dundee, for "A pocket support for photographic cameras."—April 17th, 1888.  
 5,699. WILLIAM SAUNDERS, 91, Mount Pleasant, Liverpool, for "Converting existing opera glasses or field-glasses into photographing apparatuses."—April 17, 1888.  
 5,747. EDWARD MARLOW, 28 and 30, Constitution Hill, Birmingham, for "A combined photographic enlarging camera and magic-lantern."—April 18, 1888.  
 5,763. CHARLES ADAMS RUSSELL, 7, Alfred Street, Montpelier Square, West Brompton, London, for "An automatic photographic apparatus."—April 18, 1888.  
 5,827. SAMUEL ROGER WILLIAMS, Sutton Coldfield, for "Improvements in holders for photographs, small mirrors, china, and other like articles."—April 19, 1888.  
 5,869. JOHN HARMER, Wick, Littlehampton, Sussex, for "Improvements in photographic cameras."—April 20, 1888.  
 5,974. EDMUND EDWARDS, 35, Southampton Buildings, Chancery Lane, London, for "Improvements in magnesium lighting apparatus for taking photographic pictures."—(John William Charles Coven Schirm, Germany.)—April 21, 1888.  
 5,992. JAMES HARBEN VALENTINE, 41, Reform Street, Dundee, for "A method of reproducing the indented wax covering for cylinders of phonographs."—April 23, 1888.  
 6,000. CHARLES TOMLINSON, 1, St. James' Square, Manchester, for "Improvements in photographic cameras."—April 23, 1888.  
 6,221. MONTAGU SHARPE, 21, Cockspur Street, London, S.W., for "Improvements in photographic shutters."—April 26, 1888.

Patent on which the Tenth Year's Renewal Fee has been Paid.

1,448 of 1878. W. S. ROUGH.—Photographic camera.

Patent which has become Void through Non-payment of the Fourth Year's Renewal Fee.

912 of 1884. R. GALLAND-MASON.—A microphotoscope.

1,251 of 1884. G. RYDILL.—Treating photographic transfers.

1,814 of 1884. F. W. HART.—Tripod stands.

### Specifications Published.

7464. THOMAS PRESCOTT, of Arcade Chambers, St. Mary's Gate, Manchester, in the County of Lancaster, Mechanical Engineer, for "Improvements in photographic cameras."—Dated May 23rd, 1887.

The inventor says:—

My invention relates to photographic cameras, and the em-



ployment therein of parallel bars, or bars for producing parallel motion, as a means of supporting parts, and altering the relative positions of parts forming said camera, particularly in reference to the means of supporting and connecting the front board and body of a photographic camera, in various focal positions, either with or without the aid or use of a base board; the bars connecting front board and camera body being actuated by springs, or by mechanical power, or a combination of springs and pneumatic power. In this invention, I connect the camera body and front board by means of a frame or frames, said frame or frames being constructed of two or more parallel bars forming a diagonal framing similar to the arms of an ordinary wool winder, or the framing of a lattice girder, without the side or end bars, and capable of extension or contraction, the bars being connected together by means of rule joints or suitable rivets.

4915. WILLIAM TRENEEMEN, of 10, Old Jewry Chambers, in the City of London, for "Improvements in the production of photographs in colours."—Dated 2nd April, 1887.

This process is founded upon the carbon process and its various ramifications. A photographic print is produced (from a negative taken in the usual way) in any of the several manners recommended by Swan, Lambert, the Autotype Company, and others who practise printing with gelatine sensitized, so that the action of light is shown upon development. Such print should be produced upon a collodionized glass or such other surface as will admit of its ultimate transfer to paper, glass, china, or other permanent support. A coloured print may be made by the specification, No. 797, 1866, or as follows. A glass transparency is produced by any of the various wet or dry plate processes, and varnished with a hard waterproof varnish, such as that made by mixing commercial white hard varnish and methylated spirit of wine in proper proportions. Another and better method for the process consists in printing a carbon print from the original negative, and developing this print upon a temporary flexible support, and then transferring it to glass, which has been prepared in the usual way, either by a substratum of albumen or gelatine mixed with chrome alum or other similar substance, which renders the image (after development) undetachable from the glass. This carbon transparency should also, when dry, be varnished with a similar varnish as that previously recommended. After the varnish is quite dry a piece of thin paper of strong texture, such as that known as "Rice," is damped and stretched over the film side of the transparency. By transmitted light the proper colours are washed evenly over the paper, and may, if thought proper, be shaded to any extent, so long as such shading coincided with the lights and shadows in the photograph, the outline for the colouring being supplied by the light passing through the transparency. Water colours are best for the paper painting, but in cases where some of the fine lines are concerned, or where in the final process the fitting would be difficult, oil colours should be used for painting those portions on the carbon film itself which is to be superimposed upon the coloured paper. A little experience will show where it is better to use oil colours upon the carbon film, and where water colours are to be solely relied upon with the paper backing. As little oil work should be put upon the carbon film as possible, as the paper backing will not adhere so firmly to the carbon film where oil colours are used; the carbon film having a great and uncontrollable tendency to split away from the paper backing when oil colours are used on any large amount of surface. However, when used for small surfaces, this tendency is annulled, probably from the entire contact ensured by the surrounding surfaces where water colours are employed. The oil colours should be mixed with as much mastic or other similar varnish as possible, in order to facilitate their drying, and, what is of more importance, their final adherence to the paper holding the remaining colours.

When the colouring upon the paper is completed, and is quite dry, it is immersed or floated in a warm solution of gelatine or other transparent mountant of a proper strength, say 20 per cent. of gelatine solution; the carbon print also which is to form the face of the finished print should receive a coating of the gelatine or whatever mountant is used for the coloured paper print. When both are thus prepared, the coloured paper print is laid face upwards, and the carbon print is superimposed upon it, care being taken that the colours are in their proper places under the carbon print; if the colours on the paper fit the carbon film, the two are squeezed together and left until the gelatine is set, and then immersed in a 15 per cent. solution of alum for five minutes, or the prints may be left to dry upon the glass, and after being cut round and stripped from the glass

may be immersed in the alum solution for the same period before mounting. Should the coloured paper and carbon print not fit exactly the first time of trying them together, they can easily be separated, and if the coloured paper is too short for the carbon print, by having it longer or immersing it in the hot gelatine solution it will be found to lengthen, or if the coloured paper print is too long, by allowing it to dry slightly and immersing it or floating on a solution of a lower temperature, or simply brushing it over (after drying) with the gelatine solution or whatever mountant is used, it will be found to have contracted to the proper size. The squeezing will then complete the print.

After the carbon print, which is to supply the outline for painting, has been developed upon the temporary support, it can be transferred to paper instead of glass, but this does not make the ultimate finished print fit so well, on account of the expanding and shrinking of the paper, although this even is preferable to the silver print used in the Cellerier process. When using the expression about the coloured paper print being quite dry, I do not mean the paper itself being dry, but that the colours are sufficiently set, so that they do not run when immersed or floated on the gelatine solution.

In making this specification I am fully aware of L. Farres, No. 1569, April 16th, 1880, Cellerier 5052, 23/4/85, and 14,401, 8/11/86, and Parkes 14,120, 2/11/86, and what I claim is—

1st. The use of a transparency developed on a flexible support and transferred to glass as described.

2nd. The use of oil colours to part of the film itself, and the colouring the remainder of a separate paper with water colours.

3rd. The use of a gelatine bath for floating or immersing the paper holding the water colours, and gelatinizing the film of carbon either taken together or separately.

1466. REGINALD HADDON, of the firm of Herbert & Co., Patent Agents, of 18, Buckingham Street, Strand, W.C., London, in the County of Middlesex, Civil Engineer, for "Automatic coin-freed apparatus for photographing and delivery of photographs."—Dated January 31, 1888.

The invention consists in coin-freed apparatus for the automatic photographing of persons and objects, and the preparing, finishing, and delivery of said photographs.

Claim.—1. The combination in a casing with a lens and coin-freed operating mechanism of apparatus for exposing a sensitive plate in the focus of said lens, and for deriving and finishing a photograph on said plate and delivery thereof.

2. The combination with bottles containing necessary chemical solutions and water ducts of a band adapted to move under said bottles, and ducts for the purpose set forth.

3. The combination with bottles containing necessary chemical solutions, and water ducts, said bottles and ducts being closed by valves, of a band carrying dogs adapted to open and close said valves during passage of the hand thereunder for the purpose set forth.

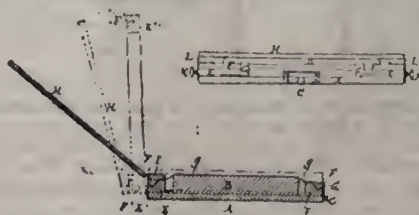
4. The combination and arrangement of sensitive plates with automatic means for successive supply thereof to the focus of the lens for the purpose set forth.

5. The combination with band *s* having dog *l*, of coin-freed lever *k* as set forth.

#### Patents Granted in America.

377,493. CLAUDE RAYMOND, Paris, France, for "Method of photographic printing in fatty inks."—Filed March 7, 1887. Serial No. 229,901. (No model.)

Claim.—1. The improved method of photographic printing which consists in coating a flexible supporting-sheet with gelatine, sensitizing the gelatine, exposing the sensitized sheet to



the action of light, de-sensitizing the exposed sheet, stretching the same over an impression-block, and printing therefrom with fatty inks.

2. The improved method of photographic printing which con-



sists in exposing a flexible sheet, coated with sensitized gelatine, washing and swelling the same, drying it sufficiently, stretching it while in a damp condition over a printing-block, and printing from it with fatty ink.

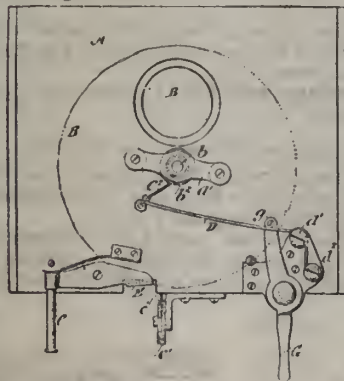
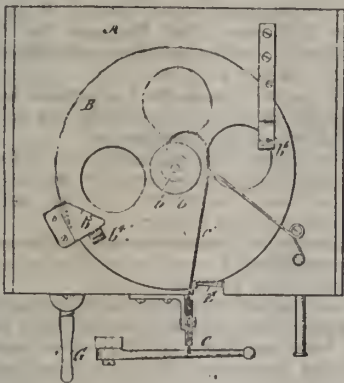
3. The improved method of photographic printing which consists in exposing a sensitized flexible gelatinized sheet, washing and drying it, spreading a dampened absorbent material over an impression-block, stretching the gelatinized printing-sheet over said absorbent, whereby it is kept moist, and printing from it with fatty ink.

4. The improved photo-ink-printing apparatus consisting of the combination of a bottom board, a stretching-frame, and an impression-block mounted on said board within said frame, with its upper surface projecting above the plane of the flexible sheet stretched therein, and with fastenings for holding said frame and board.

5. The combination of a bottom board, an impression-block mounted thereon, a stretching-frame, in two parts, fitting over said block, fastenings for joining said parts together and for holding said frame to the board, a removable bar applied across the rear of said frame, and a lid hinged to said bar.

377,554. MATHIAS FLAMMANG, Newark, N. J., assignor to The Scovill Manufacturing Company, New York, N. Y., for "Shutter mechanism for photographic cameras."—Filed Oct. 17, 1887. Serial No. 252,560. (No model)

*Claim.*—1. In a fly-shutter mechanism of a photographic camera, the combination of a board or piece provided with an opening, a rotary disk supported by said board or piece, a pulley secured to said disk, a cord wound upon said pulley, a spring having an integral portion constituting an arm connected to said cord, and a lever having a projection impinging upon the said arm of the spring, substantially as specified.



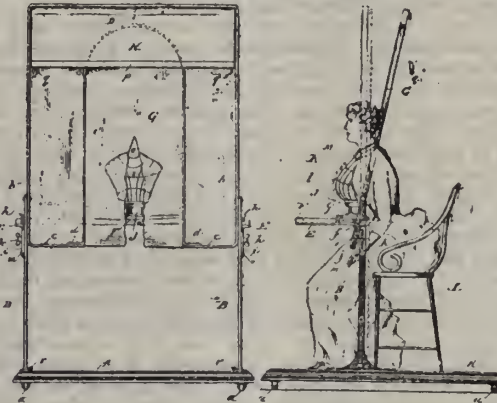
2. In a fly-shutter mechanism of a photographic camera, the combination of a board or piece provided with an opening, a rotary disk supported upon said board or piece, two pulleys affixed to opposite sides of said disk and rotating with it, a cord wound upon one of the pulleys, a pull-piece connected to this cord, a spring also connected to this cord, a cord reversely wound on the other pulley, a spring having an integral portion constituting an arm connected to the last named cord, and a lever having a projection impinging upon said arm of the spring, substantially as specified.

377,556. JOSEPH C. GOMBER, Milwaukee, Wis. "Photographic accessory."—Filed May 10, 1887. Serial No. 237,696. (No model.)

*Claim.*—1. A method of photographing living subjects to give a statuesque appearance to the finished picture, that consists in concealing the body of the subject behind a curtain or background, exposing the head and neck in front of this curtain or background, arranging a bust or analogous form so that the neck thereof will fit about the neck of said subject, and then securing a negative in the usual manner, substantially as set forth.

2. A photographic accessory that comprises a suitable frame, and a curtain or background stretched on the frame, and provided with an opening, in combination with a bust or analogous form arranged adjacent to the opening in said curtain, substantially as and for the purpose set forth.

3. A photographic accessory that comprises a suitable frame, a curtain or background stretched on the frame and provided with



an opening, and a shelf adjacent to said frame, in combination with a bust or analogous form arranged on the shelf adjacent to the opening in said curtain or background, substantially as and for the purpose set forth.

4. A photographic accessory that comprises a suitable frame, a curtain or background stretched on the frame and provided with an opening, and a vertically-adjustable shelf arranged adjacent to said frame, in combination with a bust or analogous form arranged on the shelf adjacent to the opening in said curtain or background, substantially as and for the purpose set forth.

5. A photographic accessory that comprises two vertical standards, a suitable frame pivotally connected to the standards, and a curtain or background stretched on the frame and provided with an opening, in combination with a bust or analogous form arranged adjacent to the opening in said curtain or background, substantially as and for the purpose set forth.

6. A photographic accessory that comprises two vertical standards, a suitable frame pivotally connected to the standards, a curtain or background stretched on the frame and provided with an opening, and a vertically-adjustable shelf secured to the standards, in combination with a bust or analogous form arranged adjacent to the opening in said curtain or background, substantially as and for the purpose set forth.

7. A photographic accessory that comprises a suitable frame, a curtain or background stretched on one side of the frame and provided with an opening, and a roller-curtain or background mounted on the other side of said frame, substantially as set forth.

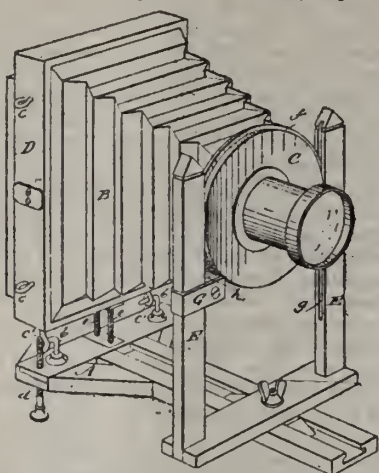
8. A photographic accessory that comprises a platform mounted on castors, vertical standards secured to the platform, a suitable frame pivotally connected to the standards, a curtain or background stretched on one side of the frame and provided with an opening, a roller-curtain or background mounted on the other side of said frame, and a shelf secured to said standards adjacent to said curtain having the opening therein, substantially as and for the purpose set forth.

378,973. FRANCIS H. PATTERSON, Norristown Pa, for "Photocamera."—Filed October 15, 1887. Serial No. 252,438. (No model.)

*Claim.*—1. The combination with the base A, of the hooks b thereon, the detachable oblong camera-back D, having eyes c and c' upon a long and a short side, respectively, of it, and the closing-screw of essentially as described.



2. The combination of the detachable oblong camera-back D, having eyes *c c'* upon a long and a short side, respectively, of it,



the base A, the hooks *b* thereon, and the adjusting and clamping screws *c c'*, for operation in relation with each other, substantially as and for the purposes specified.

3. In a photographic camera, the combination of the grooved uprights *E E* of the focusing-slide, the camera-bellows, B, the circular front end board or lens-mount, C, attached to said bellows, and provided with a circular tongue, *f*, adapted to fit the grooves in said uprights, and the sliding lever-stop G, essentially as described.

4. The combination of the circular front end board C, having a tongue *f* on its periphery, the grooved uprights *E E* of the focusing-slide, the sliding lever stop or clamp G, the bellows B, the reversible swing-back D, having eyes *c c'* on a longer and shorter side, respectively, the base A, the hooks *b b'*, and the adjusting and clamping screws *c c'*, substantially as shown and described.

## Review.

A HISTORY OF PHOTOGRAPHY. By W. Jerome Harrison. Royal octavo, boards, 144 pages, and twelve inset illustrations. Special issue of 250 subscription copies at 7/6. (Bradford, 1888: Percy Lund and Co.)

The name of W. J. Harrison has long been prominently before the photographic public in connection with laboriously compiled historical matter relating to the craft, and in the attractive volume before us we find a pleasant and connected account of the rise and progress of photography; moreover, an account rendered valuable by virtue of the laborious researches made of late by the author.

Harrison's history is crowded with items altogether unknown to most of those who are generally well-informed as to photographic matters, and the whole is so well knitted together into a connected whole, that we can can forgive the few barbarisms to be found in the work—such as the offensive pun on a person's name which disfigures page 108.

Altogether, the book is an attractive one—a book which every photographer should take pleasure in reading; and the twelve portraits illustrating it (eleven of them being reproductions of photographic originals) are as satisfactory as one could reasonably expect such a series to be.

Besides this special edition of 250 copies, there is an ordinary edition containing only one illustration; this ordinary edition costing only 3/6.

## Correspondence.

### CALCULATING EXPOSURE.

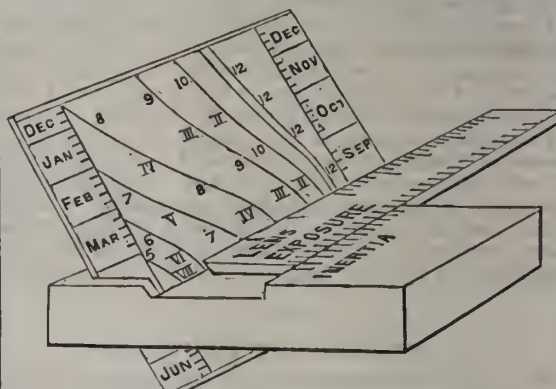
DEAR SIR,—My friend Dr. Hunter and I have just taken out a patent for an instrument calculating photo-

graphic exposures, and I felt that some account of it would probably interest you, especially after seeing your remarks in last week's PHOTOGRAPHIC NEWS respecting Ackland's Photographic Exposure Scale, and your commendation of efforts to facilitate the calculation of exposures. I believe that our instrument is the only one based upon really scientific principles, and I believe it will prove generally, as it has done in my hands, an almost certain guide to exposure, and hence a great boon to the photographer.

The instrument is really a logarithmic slide rule, specially marked and adapted for these particular calculations. It consists of four logarithmic scales corresponding respectively with the light, the lens, the "inertia" of the plate, and the exposure.

I will describe the four scales separately:—

1st. The Light Scale. This scale consists of a number of curves which correspond to every hour of the day throughout the year when the light is photographically active, and each curve represents the *mean* light throughout the year for that particular hour. As the light varies considerably in different latitudes, we propose to divide different light diagrams accordingly. These curves are obtained by calculation; but, as of course, just before sunrise and after sunset, it would theoretically be dark, we have made suitable allowances for twilight, which have been arrived at by means of careful measurement of the



SKETCH OF "ACTINOGRAPH."

It measures  $4\frac{1}{2}$  by  $2\frac{1}{2}$  when closed. When the light diagram is only required for our latitude, we prefer to mount it on a revolving cylinder.

light. This scale or diagram therefore represents graphically the *mean* light for every moment in the whole year, when the light is of any photographic value.

2nd. The Lens Scale. This scale is marked with the different ratios of apertures to focal length, and of course any desired system may be adopted. In addition to this, separate indications are given for single lenses, doublets, and triple combinations.

3rd. The Inertia Scale. This term expresses the slowness of the plate, and is capable of scientific definition. The Inertia Scale is marked with numbers which count from 0.01 to 1.0. The following "inertias" correspond with plates which are commonly known as "Extra Rapid," "Rapid," "Ordinary," and "Slow."

Extra Rapid	...	...	...	...	0.08
Rapid	...	...	...	...	0.14
Ordinary	...	...	...	...	0.20
Slow	...	...	...	...	0.35

The exact "inertia" of any particular brand of plates may, however, be easily ascertained by a simple experiment.

4th. The Exposure Scale. This is a simple logarithmic scale, indicating exposures varying from 0.1 of a second to 100 seconds.

Now suppose we were about to calculate an exposure with this instrument, say on May 1st at 8 a.m. or 4 p.m., with a doublet lens, and with an "ordinary" plate



We first set the light diagram till the date, May 1, corresponds with the edge of the lens scale. We then slide the latter till  $\frac{1}{2}$  (2) is opposite the curve marked 8 and IV on the light diagram. We then look opposite the inertia 0.2, and we find on the exposure scale an exposure indicated of  $2\frac{1}{2}$  seconds. Now this is the mean exposure for an ordinary landscape in latitude  $53^{\circ}$ . All that has now to be considered is whether the light is a mean light or not. If it is, give an exposure of  $2\frac{1}{2}$  seconds. If the light is as bright as you think it possibly could be, judging from the state of the sun, clouds, and atmosphere, give an exposure of half this figure, or  $1\frac{1}{4}$  seconds; and if, on the other hand, the light is as dull as you would think of taking a picture in, double the mean figure, which would give an exposure of 5 seconds. The necessary exposure will, therefore, lie in between  $1\frac{1}{4}$  and 5 seconds, and any error which may arise in judging the state of the light will not be greater than can be amply compensated in development.

Of course, for photographing under other conditions, suitable factors will have to be used which we shall be able sufficiently to indicate. If, for example, it was desired to take a portrait in diffuse light out of doors, the landscape exposure would require to be multiplied by 5, so that on the same day, at the same time, and with the same lens and stop, a portrait would require a mean exposure of  $12\frac{1}{2}$  seconds.

We have called our instrument the "Actinograph."

I hope you will see the assistance our instrument will be in substituting system and certainty for guesswork. However satisfactory exposure tables may be, they cannot lay the whole of the considerations which decide our exposures so clearly and rapidly before the operator. I may say that our instrument is the outcome of a very large amount of thought and investigation. I have used it myself with the greatest satisfaction, and though from my description it may seem somewhat complicated, it is in reality exceedingly simple. If you care to see and try the instrument itself, I shall be happy to send one for your inspection.—Yours very truly, VERO C. DRIFFIELD.

#### DIFFUSION OF FOCUS.

SIR,—I have not accused Mr. T. R. Dallmeyer, and do not accuse him inferentially—to use his own expression—of the ungentlemanly action of inserting qualifying words in his paper after it was read. I quoted from it as I understood him to speak, and there was nothing in the published reports at the time I wrote to suggest that my understanding of his words was incomplete.

It is quite probable that I misunderstood him. On the other hand, it is just possible that a reader of a paper, in looking at his audience or the black board, may not pick up the thread of his discourse at the point intended, or may make a quite unintentional hiatus, such as to excuse a misunderstanding on the part of the hearer. However, as I renounce any advantage that Mr. Dallmeyer's supposed admission might give me, and declare my argument to be complete without it, I cannot see what is to be gained by further dwelling on the point.

Mr. Dallmeyer now says, "Hence there is clearly a triple advantage for the lens possessing outstanding spherical aberration."

"1st. Greater concentration of the central rays for more distant objects, as acknowledged both by Mr. Debenham and Mr. Grubb."

Against this I contend that there is a very great counterbalancing disadvantage in the much larger circles of confusion as shown by Mr. Grubb, and in the fogging effect on the brightness of contiguous shadows, similar to the halation of a thinly-coated plate.

"2nd. Absolute gain in diameters of the circles of least confusion, as demonstrated by Mr. Grubb."

Mr. Grubb's demonstration was that the gain was, if fairly measured, on the side of the corrected lens.

"3rd. The enormous gain as regards contrast in definition."

If by "gain" as regards contrast, it is meant that where nothing is sharply defined, there is not so much contrast as where there is good definition somewhere, this "gain" may be freely admitted.

Mr. Dallmeyer now claims "better definition of planes beyond the point focussed upon," "neglecting, as far as possible, the question of foreground where the disadvantageous conditions would appear." On this I would remark that commonly the beard in a portrait represents the foreground, and the coarse rosy character which is given to this appendage by bad definition is one of the greatest misrepresentations of which photography is guilty.

It is something, however, for Mr. Dallmeyer to admit that the foreground definition is neglected. Mr. Chapman Jones, on the contrary, says (p. 251), "The gain within the focal point is not disputed."

Mr. Lake Price cites the great sale of the J. H. Dallmeyer portrait lens as evidence of the appreciation by photographers of the so-called diffusion of focus. To this it may be replied that the work of the instrument when screwed home to the place of most perfect definition was almost if not quite indistinguishable from that of the Petzval portrait lens, of which it was a modification.

I have met with several photographers who possessed and used these lenses, and spoke well of them when in the position of best definition, but with only one exception—and that in the case of a photographer who has, I believe, long since ceased to be engaged in studio work—they have invariably told me that they never use the diffusion arrangement.

Again, the patent for this arrangement—assuming that a patent could be maintained after Petzval's previous exposition of the principle—has long since expired. Several firms of opticians, including two of the oldest reputation and highest standing, have for some years made, as well as ordinary Petzval portrait lenses, a series of lenses in which the position of the components of the back lens is reversed, as in Dallmeyer's. I have not found, however, that they have included the separation arrangement, which, if so much valued, they might reasonably be expected to do. On the contrary, in the case of one maker, the lenses of this character are sent out with the edges cemented together, so as to render such separation impossible.

Mr. J. H. Dallmeyer claimed that by sacrificing definition at the focus, the definition of the out-of-focus planes is improved. Mr. T. R. Dallmeyer at last—impliedly, at all events—admits that the definition is worse on one side of the focus, but says that it is better on the other; a very different claim. I hold with Grubb, that "whatever way we make these comparative experiments, provided it be done fairly, we shall find the advantage with respect to depth of focus to be on the side of the corrected lens." This plain statement has not been, and I submit cannot be, refuted. W. E. DEBENHAM.

#### THE CAMERA CLUB.

FINDING THE FOCAL LENGTH AND OPTICAL CENTRE.

SIR,—Will you kindly notify in the News that on Thursday, May 10th, 8.30 p.m., Sir David Salomons will treat of "A simple apparatus for finding the focal length and optical centre of any lens."—I am, dear sir, yours faithfully, GEORGE DAVISON, Hon. Sec.  
21, Bedford Street, W.C.

#### A PHOTOGRAPHIC SOCIETY IN SINGAPORE.

SIR,—I have pleasure in informing you that the amateur photographers here have instituted a society—the Singapore Photographic Society—on the lines of similar associations at home. Photography has gained many followers in this place during the last two or three years, and we now number seventeen names on our roll, with



every prospect of considerably increasing our membership before long.

The office-bearers for the current year are—D. C. Neave, president; C. R. Harrison, hon. treasurer; A. Stephenson and A. Macdonald, members of council.

On behalf of the Society I offer a cordial welcome to any photographers who may visit Singapore, and our dark-room, &c., will be placed at their disposal.

We shall be glad if manufacturers and dealers in photographic goods would send us catalogues and price lists for the information of members.—Yours faithfully,

FRED E. JAGO, Hon. Secretary.

8, Grange Road, Singapore, 3rd April, 1888.

### FEMALE EMPLOYMENT IN PHOTOGRAPHY.

SIR,—I can quite endorse the article on above in last issue of PHOTOGRAPHIC NEWS by Emilie Colston. There is a good article in the *Century Magazine* by an American, showing it is felt there as well as here. I think there is a special fitness for women in this business. During the time I have been in it (twenty-four years) I have taught and employed many persons, and have received faithful and efficient services from ladies thus employed. One was seven years with me, and, during the last three of that time, was in charge of a studio as chief operator. This was in the days of wet plates, when soiling the hands was not preventable, but that was no obstacle to those in earnest. The public approved and were pleased with the results, which were especially good with children, who in those times required patience, owing to the long exposures required. The children seemed to feel at ease sooner with a strange lady than a strange man. Indeed, the men operators of those days considered young children a great nuisance, and almost dreaded to see them come in. This is altered now, owing to the dry plates being so quick that instantaneous exposures are the rule everywhere.

Of course for outdoor work ladies are not so well fitted, but in other branches there is a good scope. Especially in colouring and finishing there is a profitable field to cultivate. Art and photography will more and more be allied in the future. Artists are learning and using photography more than they care to let the public know, and photographers should give their daughters (and sons too) the opportunity to learn art, so that they may not be left behind in the race. Drawing is taught on the Continent much more than here, not only to those who intend to be artists, but the working classes. It is found to increase the perceptive faculties, so that when the beauty of any object is seen, it gives the power to express or show it to others by the simplest means. A portion of this power is attainable by all as easily as writing. Some, of course, take to it more readily than others, but while the most gifted cannot succeed without labour, all those really in earnest may attain efficiency. This accomplished, they can readily go further and learn that branch of painting (which is but drawing with a brush) which they find most useful.

Give, then, a portion of your time and your mind, ladies, if you are in any way connected with photography, to this art of drawing. It will be an addition to that other great power of drawing, which for the welfare of the world you all possess, and which requires no teaching: I mean that which is expressed by the poet in the line, "Beauty draws us with a single hair."

ALFRED H. BOOL.

115, Harwood Road, Walham Green, S. W.

### Proceedings of Societies.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE usual weekly meeting was held on the 26th ult., J. TRAILL TAYLOR occupying the chair. This was a lantern night.

J. FRESHWATER announced that by kind permission of C. M. Woodford, of Gravesend, he had brought down to the meeting a

collection of slides that had been prepared by wet collodion from negatives taken by that gentlemen during an exploration of the Solomon Islands. Some very interesting information in connection with these slides was given as they were projected on the screen. A map showing the geographical position of these islands was first projected on the screen; they are a group lying to the eastward of New Guinea, and were discovered by Mendana, a Spaniard, in 1567, who named them the Islands of Solomon from an idea that his countrymen, supposing the Islands, from the name, to be rich in gold, might be induced to colonise them. C. M. Woodford, after a stay of two months in Fiji, proceeded to the Solomon's in a small schooner engaged in recruiting boys to work upon the Fiji plantations. Alu was reached after some adventure, and Gorei—the king of this and the neighbouring islands—ultimately found. A house was bargained for, the price paid for the hire of which was one axe, four knives, three bead necklaces, three fathoms of cloth, twenty sticks of tobacco, and a flannel shirt. The next day two women were sent to cook, and attend to the house. At night they prepared to sleep in the house. As this only consisted of one room, objection was raised, and a kind of verandah at the back of the house eventually assigned to them. Sago yams, taro, and banana, with fish which are caught daily, form the principal native food. The fish are caught in square fishing nets mounted upon long canes, the fish being driven into the nets by beaters. Pounded yam and taro flavoured with grated cocoanut and sugar cane, made into a kind of pudding, is a favourite and constant dish. Large wooden troughs are used for preparing and pounding the food. The inauguration of these troughs is conducted with great ceremony. A picture representing one of these ceremonies was shown. The trough was about thirty feet in length, and carved to represent a crocodile; twenty-two men were seated on each side of the trough, and an old man at either end. All had their ornaments on, and wore their shields over their shoulders, their spears and tomahawks lying close by. Taro, yams, and other kinds of food were placed in the trough. At a given signal, the men began pounding the food, keeping excellent time, until they were exhausted, when their places were taken by others.

Several slides were shown of native idols, these being mere wooden images, in all cases surrounded by a heap of human skulls. Negatives of these were obtained during the absence of all the men upon a head-hunting expedition, the women being left at home to prepare a feast for them on their return. Head-hunting is a perfect passion; the natives in some of the islands, being also notorious cannibals, not only eating the bodies of their captives, but digging up for this purpose bodies recently buried. Head-hunting expeditions are taken in large canoes with very high prows, profusely ornamented and inlaid with pearl shell. Canoe houses are built for these head-hunting the canoes having high pitched roofs with the ends closed in, two narrow slits being left for the high prows of the canoes to pass through. These canoe houses are larger and better built than the ordinary dwelling houses, and a woman is not allowed to enter them, or even to pass in front of them. The canoes are made with lengths of wood sewn together with a vegetable fibre, and the seams caulked with a kind of putty obtained from scraping the kernel of a nut; this sets perfectly hard in a few hours, and is quite water-tight. The greatest distinction a native can earn is the taking of a life; no matter whether it is a man, woman, or child, the heads all count. The heads, after being slightly smoked, are hung up in the canoe houses; the estimation of a canoe house being in proportion to the number of heads it contains. The natives are intensely black; the men wear a strip of calico round the waist. The women wear a series of fringes one over the other made from a vegetable fibre suspended about two feet from their waist. A practice is made of distending the lobes of the ear. A hole is made in the lobe of each ear, pieces of sago palm bent into a hoop are then inserted to keep the hole stretched. The lobe is thus enlarged by degrees until it attains an enormous size. A slide was shown of a native having holes in ears enlarged to a least four inches in diameter. Armlets made from the giant clam shell are much worn. The ornament, however, most highly prized is a necklace of dogs teeth. A good necklace will consist of as many as 500 teeth; as two teeth only are available from one dog, a necklace of this kind would require 250 dogs to provide sufficient teeth. In some cases the teeth of live dogs are extracted, the animals being buried up to their necks in the ground for the purpose. The visit to the Islands was taken for



the purpose of making collections of the fauna, and also to explore the interior of some of the principal islands which had not been visited by white men. Penetration to any distance into the interior is rendered difficult and dangerous from the constant raids of the coast natives upon the bushmen, and retaliating ones on the part of the bushmen upon the coast natives. Some 17,000 specimens, however, were collected, consisting of lepidoptera, coleoptera, birds, mammals, and batrachians of the locality.

A hearty and unanimous vote of thanks was proposed by the Chairman to J. Freshwater for the interesting exhibition of slides. Transparencies were also shown by J. B. B. Wellington and L. Medland. One of Messrs. Newton and Co.'s Bijou lanterns was used on this occasion. The brilliant illumination given by this small lantern was very marked. C. G. Hardy was elected a member of the Association.

#### PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE Committee of the above Association met on 26th inst., when the following were elected members:—W. Cobb, Woolwich; A. G. Joy and S. E. Joy, Wimbledon; Andrew Pringle, Bexley Heath; W. Wallis, Watford; Myles Garner, F. B. Mann, G. S. Allen, Mrs. Teffer, London; D. Howie, F. J. Scarlett, E. A. Wood, W. J. Ramsey, W. Bond, and Miss K. E. Browne, of Norwich; R. Bourne and Miss M. Wilkinson, of Brighton, and J. B. Payne, Newcastle.

The following Hon. Local Secretaries were appointed:—Bath—H. J. Walker, 8, Broad Street; Newcastle—J. B. Payne, c/o Mawson and Swan, Moseley Street; Norwich—D. Howie, 85, St. Giles' Street.

THE SECRETARY announced that donations had been received from Messrs. W. W. Rouch and Co., Andrew Pringle, and a Sympathiser in the United States of America.

Progress was reported relative to the Orphan Fund.

#### DERBY PHOTOGRAPHIC SOCIETY.

THE members held their first outdoor excursion of the season on Saturday last at Duffield, when there was a very good attendance, over sixty plates being exposed. The weather was all that could be desired, and a most enjoyable afternoon was spent.

The fixtures for the season are:—May 12th, Repton; May 26th, Cromford and Matlock; June 9th, Calke Abbey; June 23rd, Tutbury; July 9th, Ashford-in-the-Water; July 21st, Chee Dale; Aug. 4th, Osmaston; Aug. 18th, Millers Dale; Sept. 1st, Little Eaton; Sept. 15th, Swarkestone; Sept. 29th, Ambergate and Whatstandwell.

#### NORTH SURREY PHOTOGRAPHIC SOCIETY.

A MEETING was held on April 24th, at the West Norwood Constitutional Club, W. A. Rouch in the chair. Walter Getting was elected a member of the Society.

A demonstration in transferotype paper was then given by W. H. WALKER. Mr. Walker, after describing the manner in which the paper was made, went on to say that it differed only from ordinary bromide paper in the fact that it had an interposed soluble substratum of gelatine. It was, therefore, manifestly possible to transfer the image-bearing film to almost any final support, including opal, ground glass for transparencies, lamp shades, and wood blocks, &c. Mr. Walker then showed the method of transferring some of the prints, which he had already developed, to opal, and the result and ease of manipulation were much admired by the members present. He also explained that very satisfactory lantern slides could be obtained by means of this paper, either by contact or in the camera, and that, whereas a slight reticulation might, by close examination, be seen in the slides themselves, yet when the image was thrown on the screen it was not visible.

LEWIS WOLFF handed round some very fine opal prints made by means of this paper.

#### BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE monthly meeting was held at the Technical Schools, Bridge Street, on April 26th, with Vice-President E. H. JAGUES in the chair.

A. J. Buncher, A. T. Mason, G. W. Merritt, Thos. Shrieves, J. Stiles, and P. Wigley were elected members, and Arden Hardwick, G. Mousley, and Whitworth Wallis, nominated for election.

The Question-Box contained: "Has bichloride of platinum

any advantage over gold for toning prints, and is it easier to work, and what colour are prints toned with it?"

W. J. HARRISON: Gives greater permanence, but as a matter of fact, it is more difficult in manipulation; the colour is black or grey.

A. PUMPHREY: Tried it years ago; gives tones like platinotype. Tones collodion slides very well and easily by using hot solution in one minute to one and a-half minutes.

A. A. NOCK: Difficult to use. The acid wants neutralizing.

W. J. HARRISON exhibited a frame containing a series of sixteen excellent instantaneous pictures of Professor Chevreul, taken in different positions by Nadar during a conversation.

J. W. MOORE: Prints on a new matt surface paper.

J. H. PICKARD: Eastman bromide prints of the Shrewsbury excursion.

HAROLD BAKER then gave a short paper and lantern demonstration. Some sixty very fine coloured slides were thrown on the screen, of Palestine, and on the way there, many of them of great interest and beauty.

During the discussion which followed,

A. PUMPHREY called the attention of the members to the very good effects in Mr. Baker's pictures produced by clouds and shadows, and advised them to endeavour to obtain similar effects in their landscape pictures.

A number of the slides by the members were afterwards passed through the lantern.

It was resolved to recommend to the Council the advisability of inserting in the *Daily Mail* each successive Wednesday the announcement of the next Saturday's half-holiday excursions, with district and departure of train, &c., &c.

#### PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

THE new rooms of the Society at No. 1,305, Arch Street, were opened to the members for the first time at the meeting on April 4th. The chair was occupied by President FREDERIC GRAFF.

The death of Joseph Zentmayer, the distinguished optician, formerly an active and more recently an honorary member of the Society, was announced by John C. Browne, who offered the following resolution (which was carried) in regard thereto:—"The Photographic Society of Philadelphia having heard with deep regret of the death of Mr. Joseph Zentmayer, one of its honorary members, it is moved that the following minute be entered upon the record book of the Society, and a copy of the same be transmitted to his family. The members of the Photographic Society of Philadelphia recognize in Mr. Joseph Zentmayer a man of great ability in his profession, and honour his name for what he has contributed to the improvement of the microscope, as well as to the production of original forms of lenses employed in photography. They recall with pleasure the friendly, genial intercourse had with him, and desire to express their appreciation of his extraordinary modesty in regard to his own most valuable improvements in the optical instruments named."

Mr. Carbutt presented the Society with a lantern slide from a negative made by him at the last meeting in the old room, by the use of his flash-light compound. The slide represented a large group of the members, and was remarkably successful, both technically and as an accurate portrait group of those present.

A small room adjoining the meeting room had been fitted up as a dark room. The primary object of this room is to afford ample facilities for demonstrations before the Society, but the committee also desire that individual members of the Society have full and unrestricted use of this room for private work, if it can be demonstrated that this may be carried on without prejudice to the Society. To this end the committee have prepared regulations governing the use of the dark room by members.

FREDERICK E. IVES showed upon the screen a remarkable heliochromic reproduction of a natural landscape, produced by a method of his own, which is similar in character to one suggested by Henry Coller, of England, in 1865. Mr. Ives stated that Coller's method, which Hauron, of Paris, first tried to reduce to practice, necessarily failed, because it was based on a false conception of the nature of light, and was an attempt to accomplish an impossibility. They assumed that there are three primary colours of light, and that the mixture of these in various proportions produces all the colours and shades of colours in the spectrum. Their plan, briefly stated, was to make a red picture by the action of red light, a yellow picture by the action of yellow light, and a blue picture by the action of blue light,



and then to combine these pictures into one, showing the colours, as well as the light and shade of the object photographed. Mr. Ives explained that the colour of no part of the spectrum could be reproduced by the optical combination of other parts, and no combination of three colours, simple or compound, could be made actually to reproduce the spectrum. The most that could be done was to combine three colours or pigments so as to counterfeit the spectrum to the eye. Mr. Ives' process was calculated to do this in such a scientific manner that each part of the spectrum must always select automatically, in the operation of the process, such a mixture of colours or pigments as would counterfeit it to the eye. Each of his negatives, instead of representing one part or colour of the spectrum only, represented one small part exclusively, and several others partially, the degree of representation being graduated to secure the proper admixture of colour or pigment in the resulting heliochrome. This was accomplished by employing colour-sensitive plates in conjunction with compound colour-screens adjusted by actual experiment upon the spectrum itself. The actual composition of the colour-screens would depend upon what colour-sensitizers and what reproduction colours were employed. The process could be made to counterfeit all the colours of nature very successfully, and although it was too complicated and costly to admit of general application, he believed it had a bright commercial future. For demonstration purposes, Mr. Ives employed the simplest form of the process, in which ordinary lantern slides from the heliochromic negatives were projected upon a screen by means of a triple optical lantern and coloured lights, but stated that equally satisfactory reproductions could be obtained in pigments. In the landscape shown, there were a white house, slate coloured barn and fences, yellow straw stacks, green grass in the foreground, dark green trees in the middle distance (one showing a single bough of deep orange autumn leaves), and distant blue hills. The colours were surprisingly bright, and all approximately correct; but Mr. Ives stated that this result had been secured with a crude form of apparatus and imperfect adjustment of colour screens, and by no means represented the capabilities of the process. A fuller publication of the process will shortly appear in the *Journal of the Franklin Institute*. At the conclusion of his remarks Mr. Ives offered to loan to the Society such apparatus as might be necessary for experiments in orthochromatic photography, also to furnish emulsions, &c., and to conduct demonstrations of the various processes before the members.

Mr. CARBUTT quoted Ernest Edwards, of New York, as saying that orthochromatic photography had enabled him to make reproductions of paintings, &c., which would have been utterly impossible before the recent discoveries in the art were made, and the process was in constant use by him.

Mr. SUPLEE showed an interesting series of *figuro studies*, made by the use of Blitz-Pulver and Cramer 35 plates. He also showed some lantern slides from the same negatives made on Carbutt's A plates with Blitz-Pulver as a source of light. A ground-glass screen was placed 3 inches back of the negatives (5 inches by 8 inches). The powder being placed 6 inches back of the screen, 40 grains or two charges were used, with a stop of about  $\frac{1}{2}$  in the lens.

Some excellent slides were also shown by Mr. STIRLING, and some by Mr. WOOD, which illustrated in a marked manner the difference in results in landscape photography between the use of long and short focus lenses.

Mr. MCCOLLIN showed an improved form of ignitor for use with flash powder, conveniently arranged so as to pack into small space. The powder was ignited at the instant required by the flame of an alcohol lamp being blown against it by a current of air produced with a rubber bulb and flexible tube. After the meeting, Mr. McCollin illustrated the use of the apparatus by making several portrait groups of the members present amid their new surroundings.

## Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The usual ordinary meeting of this Society will take place next Tuesday, May 8th, at 8 p.m., at the Gallery, 5A, Pall Mall East, when papers will be read on "Telescopes for Stellar Photography," by Sir Howard Grubb, and "Some Theoretical Considerations in Exposure; and a New Table for Enlarging," by Sir David Salomon, Bart.

PAINTING MAGIC LANTERN SLIDES.—First draw on paper the size of the glass the subject you desire to paint; fasten this at each end of the glass with paste or any other cement to prevent it from slipping. Then with some very black paint mixed with varnish draw with a fine camel's hair brush, very lightly, the outlines sketched on the paper, which of course are reflected through the glass, and when dry fill up the other parts in their proper colours. Transparent colours must be used for this purpose, such as carmine, lake, Prussian blue, verdigris, sulphate of iron, tincture of iron, wood, gamboge, &c., and these must be tempered with a stroug white varnish to prevent their peeling off. Then shade them with black or with lustre mixed with the same varnish.—*Picture and Art Trade*.

ABSORPTION OF GASES BY PETROLEUM.—By S. Gniwosz and A. Walsiz (*Zeit. physikal. Chem.*, 1, 70-72).—The statement that a layer of petroleum will protect an aqueous solution from the action of the air has led the authors to examine the absorption of oxygen and other gases by Russian petroleum, and it is shown that the absorption of oxygen is greater for petroleum than for water, so that the protective action above spoken of must be a doubtful one. Anyone can now understand why the method of covering the iron developer with a layer of petroleum has not proved so successful as was originally expected.—*Part of the above is from the Journal of the Chemical Society*.

PHOTOGRAPHIC CLUB.—The subject for discussion on May 9th will be "Matt Surface Printing." Saturday outing at Hampstead, meeting at "Bull and Bush" at 6 o'clock.

## To Correspondents.

\* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

H. D. M.—This correspondent asks: "A and B are photographers, and employ C. C takes some specimens of his own child, and A and B are very pleased, and give C some of the copies. A and B sell their business to D. D dismissed C, C opens for himself in the same town. Can he exhibit his copies of his little boy in his own show-case? Can he enlarge from same copies? They are not copyright."

ENGINEER.—The cost is about one-and-sixpence, and the form to be filled up can be had, post free, from Piper and Carter for threepence.

Q. H.—1. We cannot tell you who makes them. Many of the commercialists who profess to be makers, merely purchase plates and sell them again. 2. You must test the samples yourself if you wish to be on the safe side. 3. Only by having a thicker layer of adhesive material, more moisture in the paper, or both.

J. H. BURTON.—1. It is to be found in the Proceedings of the Royal Society, but we cannot give you the exact reference. 2. This depends altogether on the construction, but generally it is due to the concave surfaces which face each other.

A. MORRISON.—You can obtain it by writing to Nelson Dale and Co., of Dowgate Hill, London. The X opaque is unsuitable for the purpose, as it generally fails to granulate.

GILBERT & RIVINGTON.—A firm of your standing and experience ought to know that a request for an opportunity of quoting for the printing of the PHOTOGRAPHIC NEWS should not have been sent to the Editor, but either to the Publishers or to the Proprietor. Still, we are glad to hear of your "special facilities for newspaper printing on a cheap scale."

W. M.—If the photograph is copyright, you can be prosecuted for reproducing it; it being quite immaterial whether the original bears the word "Copyright."

J. B.—Perhaps on the whole it is the best book; at any rate, we know of no other which we decidedly prefer.

W. SYMONDS.—See our article on the subject. We recommend you not to do as you propose.

H. SOUTHGATE.—The sample of blacked card hardly enables us to judge as to the merits of your preparation.

T. B. W.—That you mention will probably answer, but as all are not quite identical, you had better stipulate for a trial before purchase.

## The Photographic News.

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# THE PHOTOGRAPHIC NEWS.

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### THE RAPIDITY OF THE LENS.

THE tendency which we have repeatedly noticed to set out the varying conditions under which photographic work is undertaken with greater accuracy, so that guesswork may as far as possible be eliminated, and its place taken by calculation, received a further illustration last Tuesday evening, in a paper entitled "Theoretical Considerations in Exposures," read by Sir D. J. Salomons before the Photographic Society of Great Britain.

In the present instance the paper itself, however laudable may have been the intention of its author, will not add much to our stock of information, and its usefulness may rather be looked for in the attention which is drawn to the subject, and in the opportunity which was afforded to the members to show, by the vigorous criticisms which it called forth, that the Photographic Society of Great Britain is not in that sleepy moribund condition which has sometimes been observed, when any paper is received with a languid customary acquiescence that indicates lack of vital interest.

The number of considerations entering into the calculations for exposure is so great that many will not undertake to weigh them against each other, and strike the balance which shall point out the particular exposure to be given in any particular case. These say that they can look at the image on the ground glass, and can judge from its brightness, as it appears to their eyes, what is the exposure required; and that from this one indication they obtain a result which is rarely seriously wrong. For those who are in such complete enjoyment of this happy faculty of correct judgment, further aids may be unnecessary; but there is the far larger number, even amongst careful and experienced workers, who are somewhat diffident of the accuracy of their judgment, and who recognise that this judgment varies in the same individual with causes, such as state of health, that are not under control. By these, as well as those who have less experience, what aid science can give, either in the shape of well-ascertained data, or of tables to save the trouble and liability to error of individual calculation for every particular case, will be welcomed.

The various considerations connected with the lens as affecting the time of exposure—and it is with the lens alone, and not with the rapidity of the plate or other matters, that we are dealing just now—form an interesting study for those whose tastes and acquirements are of a mathematical order. The results, however, of such a study are most useful to the photographic public at large, when presented in the simplest language, and with no more display of mathematical formulæ than is absolutely necessary. In the paper of last Tuesday there is an unhappy combination of mathematical formulæ which are over the heads of those who have not made a speciality of this depart-

ment of science, with a basis of assumed fact so loose or incorrect as to vitiate the accuracy of the deductions arising therefrom.

The author of the paper set out with a statement that the equivalent focus and the aperture of a lens were not sufficient data for ascertaining its relative rapidity. There were other considerations, the colour of the glass and the number of reflecting surfaces, which he proposed to sum up and call the remaining transmitted light efficiency. This efficiency would have to be multiplied with the ordinary expression to obtain true rapidity. It was, however, pointed out by the speakers who followed, that the means directed for ascertaining this efficiency were so inaccurate that, as Captain Abney observed, he would rather be without the so-called efficiency value engraved upon his lens.

One statement put forth by the author was so extraordinary that it may seem incredible that it should have been publicly made. He said that any object moved along a line between the planes of depth of focus, whether they are close together or are infinitely distant, do not appreciably alter their size in the image." One of the subsequent speakers challenged the author to say whether, in accordance with this assertion, a ship a mile distant would appear of the same size upon the ground glass as if it were at double that distance, and elicited the reply that it would do so, unless the lens were of so long a focus that the adjustment of the camera would have to be altered for getting one or other of the vessels into focus.

This statement as to equality of size of image when within the planes of depth of focus, would involve this: that with a pinhole camera an object will appear of the same size at whatever distance. Further refutation than this *reductio ad absurdum* is unnecessary, though it might be put in other ways, such as that a hill a mile off must be as large as the sun, since its image may cover that of our luminary, or that the moon must be larger than any of the fixed stars, since both are within the plane of depth of focus, and the moon's image appears the larger in the camera.

The author's statement that brightness increased with distance, so that, but for absorption of light by air, distant objects would appear of dazzling brightness—"like electric lights upon the ground glass"—was also flatly contradicted, Capt. Abney putting it that brightness is the same at whatever distance—supposing, of course, that the object was outside the distance where alteration of focus would be required. The same authority added that he hoped that it would not be assumed by the world at large that the Society accepted these statements, which were absolutely wrong, scientifically as well as practically.

The method suggested by T. R. Dallmeyer for ascertaining the efficiency of the lens by direct photographic test is more promising; but Capt. Abney stated that the



efficiency itself would vary in the same lens ; and another speaker pointed out that the additional exposure required in consequence of the loss of light by reflection when several surfaces were involved, would be in part, at all events, neutralised by the auxiliary exposure which would result all over the plate, so that in practice the indication for exposure given by the relation of aperture to focus is not in so much need of correction as might be supposed.

It is an ill wind that blows nobody good. If the paper to which we have referred, or the discussion upon it, leads some photographers to devote a little attention to a subject—the optical one—which many are apt to consider too dry to be entered into, good, after all, may result.

## NOTES ON THE ROYAL ACADEMY.

BY WIDE ANGLE.

JUDGING by the present exhibition, the Royal Academy will soon be nothing more than a huge portrait painting establishment. Never have so many portraits of uninteresting individuals been hung upon the line. Whether it is now the fashion to be painted by an R.A., or whether the luxurious style in which most of the forty live necessitates competition with the portrait photographer, is impossible to decide.

The lamentable fact remains, that men hitherto associated with imaginative and earnest work, and to whom we have been taught to look as the best representatives of British artists, have degenerated into mere journeyman portrait painters in the employment of the wealthy.

Take the names of those Academicians who paint figure subjects. Mr. Calderon has two pictures, both portraits ; Mr. F. Goodall three, one a portrait ; Mr. J. E. Hodgson two, both portraits ; Mr. Herkomer seven, all portraits, and it is with sorrow one has to chronicle the fact ; the President two, one a portrait ; Mr. G. D. Leslie two, one a portrait ; Mr. E. Long five, three portraits. The painter of the "Babalanian Marriage Market" is content to be chiefly represented by portraits of Lord Randolph Churchill, Col. Henderson, and a Mr. G. M'Corqudale—whoever he may be ! Mr. J. Seymour Lucas, out of three pictures, has one portrait ; Pettie, two out of four ; E. J. Poynter, five out of six ; V. Prinsep, two out of four ; W. F. Yeames, two out of three ; and H. T. Wills, two out of four. Then we have the professed portraitists. Mr. F. Holl heads the list with eight, and doubtless could have sent eighteen if the rules of the Academy would have permitted him to do so. Mr. P. R. Morris sends six portraits—one about as bad a specimen as could be desired. Mr. Oulss contributes six, Mr. W. B. Richmond four, and Mr. Sant five, one of which, dignified by the name of "An Awakening Soul," may be excepted. We have thus a grand total of fifty-nine portraits contributed by R.A.'s. Against this may be set thirteen imaginative works by the gentlemen mentioned above, in addition to thirty pictures by Messrs Burgess, E. Crowe, W. C. T. Dobson, F. Faed, W. P. Frith, L. Fildes, A. C. Gow, E. J. Gregory, J. R. Herbert, H. S. Marks, Orchardson, Briton Riviere, G. A. Storey, G. F. Watts, H. Woods, F. Dicksee, E. Armitage, and Alma Tadema—in all, forty-three.

This enormous preponderance of portraits shadows forth a melancholy prospect. Not the least disagreeable feature about them is that, being by R.A.'s, they must, as already noted, occupy the best positions. A portrait hung on the line compels you to look at it, whether you will or no, and the more hideous it is, the more it pursues one. In every room portraits glare from their canvases to the detriment of the pictures right and left. W. B. Richmond's "Prince Bismarck," with its greenish tints about the nose and forehead ; E. Long's sickly representation of "Lord Randolph Churchill," and F. Holl's portrait of "Gladstone," in whose complexion soot has somehow got mixed ; and Mr. Herkomer's picture of the Speaker of the House of Commons, may

be tolerated for the sake of the sitters themselves ; but who cares for Sir William Cunliffe Brookes, Sir John Pender, the late Lord Mayor of London, and a host of other nonentities which abound in every direction ? It is vain to ask why such monstrosities as the portrait of the Prince of Wales are hung. The answer is that the painter is an R.A., and that is sufficient. What is to be the end of the mania for portraiture it is impossible to foresee ; but in the meantime, in mercy to the long-suffering public, the portraits might all be hung in one room, so that everybody might know what room to avoid.

Turning to other contributions, there is little in what are supposed to be the principal pictures to excite admiration. The truth is, the Academy this year is far below the average. Several of the best men have abstained from exhibiting, and others in the first rank have been satisfied with being represented in a perfunctory way. The picture of the year, if it may so be called, is Alma Tadema's "Roses of Heliogabalus," and a most disappointing work it is. The fat, sensual faces of the Emperor and his boon companions are repulsive ; the roses which are showered down upon the women below are obviously painted roses ; and the only female face which can be seen above the mass of blossom is ugly. The picture has been written up, and therefore the crowds gather in front, but there is nothing to justify the praise which the daily papers have bestowed upon it. The odd thing is, that next to it is hung Sir J. E. Millais' "Murthly Moss, Perthshire," a wonderful piece of work, and quite worthy of the painter of "Chill October." The open-mouthed spectators wait patiently in front of this picture, but never look at it, they are so anxious to take their turn to see Alma Tadema's Roses.

W. Q. Orchardson, like Millais and Tadema, sends but one picture, the much paragraphed "Her Mother's Voice." Mr. Orchardson has failed this year quite as much as Mr. Alma Tadema. The picture lacks interest, and the only reason why an old man has been put at one end of a picture, and a girl with open mouth at a piano and a young man bending over her at the other, is to show how cleverly the artist can deal with empty spaces of canvas. But everybody knows this already, and there was no necessity for Mr. Orchardson to reiterate it. The only justification would have been the story represented, but here there is little or no story at all.

There are some artists from whom everybody knows what to expect. It does not seem worth while to do more than mention the fact that T. Faed, Colin Hunter, J. C. Hook, and Sidney Cooper exhibit. Their pictures are neither better nor worse than they have exhibited before, and with this announcement their admirers will be quite content. Marcus Stone has two pictures : one a trivial diploma work, and the other entitled "In love." Mr. Stone has done something very much like it before. He has given us the same girl's face—a very sweet face, we do not deny—many times, and, if we mistake not, the same tree. The old gentleman of H. S. Marks, also a one picture contributor, has in the same way done duty on many previous occasions. It is time he was shelved. F. Goodall's flesh painting is as bloodless as ever in "David's Promise to Bathsheba," and it is as difficult to understand why he paints such pictures as "By the sea of Galilee," as it is to explain why such pictures find purchasers. Vicat Cole, another R.A., represented by one work, has contrived to idealise a much-painted subject, "The Port of London." It is a very clever and effective picture, and not at all like what the Port of London really is. But, perhaps, this was intentional. Sir F. Leighton's "Captive Andromache" is one of those pictures which one pronounces "very fine," and get away from directly, while his portrait of Lady Coleridge, we sincerely trust, is meant to be a caricature.

A. J. Brett's landscapes are as unlike anything seen on the earth, or in the waters under the earth, as ever they were, and B. W. Leader contrives to make Nature look as "pretty" as of yore. Mr. Leader always gives us the



impression that he plants his own trees and builds his own rustic cottages; everything seems to balance so nicely, and never to upset the orthodox canons of art.

J. W. Waterhouse occasionally puzzles his critics. This year he will amuse them. His *Lady of Shalot* is the funniest thing which has been exhibited in the Royal Academy for many a long year. In a boat decorated with tawdry patchwork hangings, he has placed a young lady suffering from a severe cold in the head, with a type of face commonly seen among the half-starved work-girls of the East End. If the attack of influenza from which the *Lady of Shalot* is suffering is a touch of realism, and intended to illustrate the effect of the cold damp air, then we compliment the artist on his truthfulness.

John Pettie still dwells in the middle age. His best picture is "*The Traitor*" (No. 220). It is painted with all the painter's old skill, and is just what might be expected from Mr. Pettie. In his other picture, "*The Clash of Steel*," the lady whose gallant is half inclined to take part in a street fray seems to be much more concerned in holding up her dress, than anxious to prevent the young man from drawing his sword.

Briton Riviere is not well represented this year, unless we except the painting of dog's head in the picture of a girl playing the violin, entitled "*A Cavatina*." We are afraid the girl is but a learner, for the dog is evidently indulging in a prolonged howl. Henry Moore has never painted anything finer than "*Nearing the Needles*." The sea and the effect of sunshine are as absolutely perfect as anything of the kind can well be.

So much for the principal pictures exhibited by the R.A.'s. The contributions of the outsiders we have left for a subsequent article, as they demand a second visit. It must suffice to say that on a cursory examination there seemed a good deal that is praiseworthy, but much more that was not worth hanging.

#### EMULSION MAKING, AND DEVELOPMENT OF GELATINO-BROMIDE PLATES, ESPECIALLY CONCERNING THE USE OF CHROME ALUM.

BY W. K. BURTON (Imperial University, Tokio, Japan).\*

I NEVER had much experience in the use of chrome alum in emulsions at home, for the simple reason that I never felt the want of it. Frilling is one of the few evils met with in emulsion work that I have practically not been troubled with at all, and the weather has never been so hot at home that the film was likely to be actually melted off the plate—at any rate, when the pyro developer was used, and I scarcely ever use any other. Very soon after I came out to Japan, however, it transpired that if I intended to make any plates, I would have to take special precautions to prevent the film from actually melting. One of my first experiences was during the heat of summer, with my own plates, and I had the pleasure of seeing the film of three of them that I was developing in the same dish dissolve clean away.

I soon found that not only my own plates, but many of English make, acted in the same way; on the other hand, all American plates that I have had any experience of here stand the heat excellently. The fact, of course, is that American plates have to be made to stand heat, or they will not work at home. English plates never need to stand at home anything that would be called heat even in this semi-tropical climate, and the English are rather slow to recognize that the requirements, in the case of many articles, may be different abroad from what it is at home. It is on account of this uncertainty as to whether the films will stand heat or not, that English plates have not, on the whole, as high a reputation as American out here, or, I believe, in any very hot climates.

Well, as I have said, I soon came to the conclusion that I would have to put chrome alum into my emulsions if I intended to make plates here, and the conclusion was not a cheering one, because my recollection of experiments, made some years ago, with chrome alum, was that I met with persistent failure. One of two things generally happened: either the chrome alum had

no effect on the plates—or no appreciable effect, at any rate—or it spoiled the quality, reducing the sensitiveness, and also the power of getting density.

On considering the matter here, it appeared to me that I found a possible explanation of my former failure. Chrome alum is an acid salt. Its acidity cannot be neutralised without its ceasing to be chrome alum any longer. Besides this actual acidity of the salt, however, there is, in commercial samples of chrome alum, a very considerable amount of free acid—sulphuric acid, I believe. This is, moreover, in variable quantity, and it occurred to me that to this free acid was probably due the uncertainty of the action of the samples of chrome alum that I had used, which were all of mere commercial quality. To get neutral chrome alum—or rather chrome alum free from excess of acid—is not very easy. The orthodox way of setting about to get it is by re-crystallization, repeated till the substance is got in a perfectly pure state; but re-crystallization is always a more or less troublesome process, and is particularly so in the case of chrome alum, as its solution cannot be raised to nearly the boiling point, otherwise the form of the salt is changed, and it becomes uncrystallizable. Moreover, the fact that, even when the salt is free from excess of free acid, it gives an acid reaction with litmus paper, makes it difficult to tell when the free acid has really been got rid of. I therefore proceed in the following way:—I make a 5 per cent. solution of the ordinary commercial salt; I would make my favourite 10 per cent. solution, but that, in spite of a certain table of solubilities that tells me that I ought to be able to do so, I found it impracticable to make a solution so strong.

To the 5 per cent. solution I add, drop by drop, liquid ammonia. A white precipitate is formed which, so long as there is any free acid left, is quickly re-dissolved; when, however, the free acid has all been neutralized, the precipitate is no longer re-dissolved, but remains in a flocculent state in the liquid. It settles in time, and then the liquid may be looked on as a 5 per cent. solution of chrome alum free from excess of acid. I presume that a certain quantity of sulphate of ammonium is produced, but it certainly is not sufficient to have any practical ill effect on the emulsion. If, by accident, too much of the ammonia has been added, and a great quantity of precipitate remains undissolved, a little more of the 5 per cent. solution of chrome alum may be added, till the solution is all but re-dissolved. I was told by an eminent chemist, that adding ammonia to a chrome alum solution till there is an insoluble precipitate ought to destroy the properties of the solution. As it does not, I don't think that it much matters whether it ought to or not. I find that chrome alum, prepared as I have described, is quite certain in its action, and has no slowing effect on an emulsion to which it is added in such quantities as to give very insoluble films.

I now come to a point at which the instructions given for adding chrome alum to emulsions are, all of them that I know, misleading. They all say to add so much chrome alum to each ounce of the emulsion or to a certain measured quantity. Now the amount of chrome alum needed bears a definite ratio to the quantity of gelatine in the emulsion, but none to the quantity of water. As long as the same formula precisely is used, the ratio of the water to the gelatine may remain approximately the same, and therefore a certain amount of chrome alum added to a measured quantity of the emulsion may give a tolerably constant quantity with relation to the gelatine, although even then it will be very approximate only; but if any of the conditions of work be changed, then the quantity will not be even approximately correct.

I have arrived at the following results, after many experiments:—If chrome alum is added to the amount of  $\frac{1}{2}$  per cent. of the weight of gelatine in the emulsion, the melting point of the films of the plates will be raised by about 20° Fahr., and that is all that is necessary for such a climate as that we have here; where the thermometer very seldom rises to 100° Fahr. in the shade, double of that quantity may be added without endangering the sensitiveness of the emulsion, and then the melting point of the films will be raised about 50° Fahr., which, I imagine, puts them out of danger of melting in any climate. Of course, I cannot say that these figures will hold for all qualities of gelatine, but they hold for two different qualities that I tried.

A word on the suitability of different gelatines for emulsion work whilst I am on the subject. I could not get any of the recognised emulsion gelatines out here, and I had to make trial of what I could get to find a sample that would suit. I found

\* A Communication to the Photographic Society of Great Britain.



the most extraordinary differences in the results got by different gelatines, and could not find any relation to exist between the general physical qualities of a gelatine—high melting point, stiff setting power, &c.—and the suitability, or the reverse, of the sample, for emulsion work; and came finally to the conclusion that the only way in which to decide whether a sample of gelatine is suitable or not is to try it. One of the samples that gave the very best results was of French make—or at any rate bore a French label stating that it was intended for culinary purposes—but had no name of either maker or vendor on the packets. The most remarkable result got was with a sample of gelatine purporting to be Nelson's "No. 1," and done up in a packet exactly resembling those in which that well-known brand of gelatine is always packed. This gave an emulsion containing innumerable particles of absolutely insoluble gelatine—particles that could not be dissolved by any amount of soaking followed by any amount of heat. Even when these particles were filtered from the emulsion the latter was absolutely useless, being insensitive, and refusing to give density of image.

Another point in connection with the use of chrome alum. There have been given out the most extraordinary contradictory statements as to whether the use of a bath of this substance, before development, is or is not permissible.

The following statements have been made by different experimenters:—

The use of a chrome alum bath before development is permissible, the subsequent development not being in any way retarded on account of it.

The use of such a bath is not permissible, its result being to render development impossible.

The use of such a bath is permissible in the case of the iron developer, not interfering with subsequent development at all; but is not permissible in the case of the alkaline developer, development being rendered impossible.

It is evident that all of these statements cannot be true; but it occurred to me that again the discrepancy might be due to the varying amount of free acid. To determine this, I made up a 5 per cent. solution of a sample of chrome alum that I knew to contain much free acid. I neutralized the free acid of one portion of this solution and left the other portion as it had been. Plates were then prepared in the following way:—They were exposed in the camera, they were then carefully levelled, and on one end was spread the neutral chrome alum solution, on the other the acid solution, and the central portion of the plate was left dry. In each case as much solution was poured on the plate as would remain on it, and the solution was allowed to act for five minutes. At the end of that time the plates were thoroughly washed to eliminate the chrome alum. They were then submitted to both the alkaline and the iron developer, with the following results:—

**Alkaline Developer.**—The portion of the plate which had not been treated at all developed first. About half a minute afterwards the image on that part which had received treatment with the neutral chrome alum made its appearance, and it was followed, before many seconds, by that which had been treated with the acid alum. After a time both the alum-treated parts of the plate made up to the other in the matter of detail, but they remained far behind in the matter of density. Indeed, no reasonable amount of time of development would give anything like sufficient density in the parts that had been treated with chrome alum. With weaker solutions the action on preventing the gaining of density was naturally less marked. With a solution as weak as one per cent. it was not at all very marked.

**Iron Developer.**—With this developer the action was totally different from that with the alkaline developer. The three parts of the plate began to show a visible image at as nearly as possible the same moment, those which had been treated with the chrome alum showing, if anything, a little before the others, and gaining density a little the quickest. There was no perceptible difference in the amount of detail got in the different parts.

It is to be observed that in no case, neither with the alkaline nor with the iron developer, was there any practical difference in the action of the solution containing the free acid and of that without, as regards its effect on development; but the neutralized chrome alum had, in every case, much the strongest tanning or hardening effect on the film. Some commercial samples of chrome alum contain, in fact, so much free acid that they have hardly any hardening effect at all.

Seeing that the chrome alum appeared to agree so well with the iron developer, my next experiment was to mix the alum directly with the developer. The result of the experiment was

in every way satisfactory. There was dissolved in the potassium oxalate solution chrome alum to the extent of 5 per cent., and the developer was further mixed in the usual way. The result of applying it to exposed plates was that the image rapidly appeared, and that density was readily got.

The deductions from my experiments I consider to be as follows:—

The use of a chrome alum bath of greater strength than one per cent. is not permissible before using the alkaline developer.

A chrome alum bath of any strength may be used before treating a plate with the iron developer.

If, however, the object is to prevent frilling, the best thing to do is to add the chrome alum to the iron developer in the manner described above.

The ordinary commercial chrome alum, even if it contains a considerable quantity of free acid, acts as well in those cases where a chrome alum bath is admissible as that which has been neutralised.

I have somewhat wandered from one subject to another in this paper, and there will perhaps be no harm if I wander to one more, as it is one on which I can speak with considerable confidence. I refer to the effect on gelatine emulsions of several times melting and allowing to set. A. L. Henderson has recently called attention to the advantage of this procedure, and I have found that by melting an emulsion three times and allowing it to set again the sensitiveness has been increased, sometimes as much as four times, and this in the case of an emulsion by no means slow before the treatment. I have not found any difference when minute quantities of soluble nitrate and of soluble bromide are added, as recommended by Mr. Henderson, before the melting and setting of the emulsion, and when they are omitted.

When, some years ago, Abney published the statement that the mere keeping of an emulsion for some days resulted in an increase of sensitiveness, I tried a number of experiments in connection with the matter. I found that the increase certainly did not of necessity take place in all cases. This was proved by the following set of experiments, the results of which were communicated to the Photographic Club at the time:—Plates were coated and were kept in water for various number of days, the result being, of course, the same as that of keeping the emulsion in a cold state. In no case did the plates show any increase of sensitiveness. On the other hand, in some other experiments there was a decided increase of sensitiveness. It is now clear to me that in some of these the emulsion was re-melted once or oftener, as would be natural in such experiments, and it appears strange to me that I did not at that time notice, what I now consider to be the fact of the matter, that an emulsion gains nothing in sensitiveness by keeping in a cold state, that it may gain considerably by keeping at such a temperature that it is a liquid; but that in such case there is considerable danger of fog, if the emulsion be either raised to so high a temperature as to give a considerable increase of sensitiveness, or be kept long enough at a moderate temperature, whilst a very marked increase of sensitiveness may arise, with very little danger of fog, from re-melting the emulsion and allowing it to set again several times.

It may be of some value to know the result of a number of experiments made to determine how many times the re-melting may be performed with advantage. I have found that no appreciable increase of sensitiveness was got after three re-meltings, although many more did not in any way damage the quality of the emulsion.

It may be worth while here to mention that there is a very exaggerated notion in the minds of some as to the damage that gelatine in solution is likely to suffer from heat, either frequently applied or applied for a long time. The late Walter Woodbury made a statement some three or four years ago to an effect which at first sight appears to be in direct opposition to all the received opinions on gelatine solutions. He stated that the only way in which to prevent a gelatine solution from becoming liquid by decomposition is to frequently re-melt it by the application of heat. I can corroborate this statement, and can, moreover, show why it is true.

There are two distinct forms of decomposition to which gelatine in solution is liable. The one is the conversion of the gelatine into "meta-gelatine"—a substance soluble in cold water; the other is "putrefaction," a change not thoroughly understood, but certainly always accompanied by the appearance of a micro-organism, and probably caused by such organism, inasmuch as, if the organism be destroyed, the putrefaction will cease. The organism itself is destroyed by a moderate amount of heat,



at its germs are not. The only way in which to destroy the whole micro-organic settlement is to repeatedly apply heat, and allow the solution to cool, so that germs develop into organisms, and are then killed.

Both forms of decomposition mentioned result in destruction of the setting qualities of the gelatine. The first-mentioned, however, only sets in if the solution is kept for a very long time at a high temperature; the other sets in at ordinary temperatures. It might be written as to the causes likely to start the decomposition of putrefaction; but it will suffice here to remark that the causes always exist in the way in which gelatine solutions are commonly kept, whether the solutions be in the form of emulsion or not. As a practical fact, it will be found that an emulsion will retain its setting properties longer if it be re-melted every day than if it be left cool. Probably the presence of ammonia, or of a large quantity of soluble bromide or nitrate, prevents the putrefaction, and hence the reason that an unwashed solution will keep almost indefinitely without liquefying.

Henderson has recently drawn attention to the good effect of re-melting an emulsion several times; but I do not know to whom is due the credit of first pointing out the advantage of such a proceeding. As I remember it, Henderson first brought forward the matter at a meeting of the Photographic Convention, held in the autumn of 1886. Now I find in Abney's "Instructions," dated South Kensington, July 1886, the following remarkable statement, in a foot-note, page 151:—"The sensitiveness increases nearly three times by keeping a couple of days before coating the plates, especially if it be occasionally wetted" [sic]. Now, I can only suppose that "wetted" is a misprint for "melted." To whomsoever the credit is due, the discovery is of great importance, and the recognition of the fact will probably serve to reconcile some of the extraordinary discrepancies in the results of different experimenters.

I believe that Henderson was the first to call attention to the advantage that may sometimes result in the ammonia-nitrate emulsion process, from converting only a portion of the silver-nitrate solution into ammonia-nitrate. I don't remember whether he pointed out any difference in effect if the ammonia-nitrate portion of silver-nitrate solution were added before or after the other to the bromide solution, of course, I mean. In any case, it may not be out of place if I state here that there is a very great difference in the result. If the ammonia-nitrate solution be added first, the quality and rapidity are both greater than if the other portion be added first. Moreover, the bromide will be a finer state of division. The latter fact probably accounts for the others, and there will be less danger that a portion of the silver bromide will fall to the bottom of the vessel in a granular and useless form. In fact, the presence of only a small quantity of ammonia at the beginning of the process of emulsification has the effect of considerably raising what I will call the "saturation point" of the emulsion. I must explain what I mean by saturation point. If we take a certain quantity of gelatine solution, and make an emulsion of bromide of silver in it, we will find that the solution will only support, in the form of emulsion, a certain quantity of the bromide, any excess being precipitated in a granular form. Moreover, if there be over a certain minimum of gelatine, neither the quantity of that substance that is present, nor the manner of mixing, will make any marked difference in the quantity of bromide that can be emulsified. Roughly speaking, the saturation point is reached if the solutions are neutral, when the bromide from 400 grs. of silver nitrate are emulsified in the presence of twelve ounces of water. When there is present a quantity of ammonia sufficient to convert a quarter of the silver solution or more, it is reached in presence of eight ounces of water.

Whatever process is used for gaining sensitiveness, the sensitiveness is most rapidly gained when the emulsion is just at the point of saturation. I do not know what influence the amount of excess of soluble bromide may have in raising or lowering the saturation point. My experiments were made in presence of an excess of from 15 to 20 per cent.

## ON STEREOSCOPIC PHOTOGRAPHY.

BY A. STROH.\*

It is a matter of surprise and regret that so beautiful an invention as the stereoscope by Sir Charles Wheatstone, and its later modification by Sir David Brewster, should have shared the fate

of other novelties, and should have been (at least as a popular instrument) a nine days' wonder. Probably the stereoscope will never become popular again, unless, perhaps, some new departure is made in it.

What is, however, more surprising is, that amateurs do not more frequently avail themselves of the means at their command, through the stereoscope, of giving certain charms to their productions which they could not obtain in any other way—such as the effect of relief and solidity of the objects represented, as well as depth of scene.

I have heard it said that the reason why stereoscopic photography is not practised more often is, that it gives too much trouble, and requires more time than the amateur can generally bestow upon it. If this be the only disadvantage, then I think I can show that in order to produce a good stereoscopic slide, no more trouble nor time need be expended than in making a half-plate or quarter-plate picture, if the proper means be at hand.

There is, however, one other obstacle, and that is that at the present time there are but few stereoscopic cameras in the market, and perhaps none at all of the detective class. But there can also be no doubt that makers of photographic apparatus will soon produce cameras and other necessities if they find that there is a demand for such articles.

### The Camera.

The simplest way of obtaining a stereoscopic camera is by taking out the rising front of an ordinary half-plate camera, and replacing it by a front with two lenses. The only other arrangement necessary is a partition inside the camera, which divides it into two compartments, and which can be made of thin wood, card-board, or other suitable material.

Much can be done with such a camera, but since we are now moving in the right direction by using detective cameras for instantaneous work, a stereoscopic detective camera is what is really wanted.

In order to make a camera of the last-named description, many conditions have to be fulfilled, and on this account, together with the fact that many of the parts have to be in duplicate, such a camera must necessarily be more or less complicated.

Having felt a strong desire to possess a camera of this class, and not being able to procure it in any other way, I have constructed one myself, a description of which I trust may be interesting to the members of the Camera Club.

This camera consists externally of a square box without any projections excepting a leather strap to serve as a handle. Its dimensions are 9 by 8 by 6½ inches. The back consists of a slide, which is drawn out when plates have to be changed. The plates themselves are in tin carriers, eight of which are contained in a compartment provided for them in the upper part of the box. The plates I use are the usual stereoscopic size—viz., 6½ by 3½ inches. Each plate, after being exposed, is drawn down with its carrier into a lower compartment by a button or knob, which is concealed in the bottom of the box.

This shifting arrangement for the plates will be readily understood by those who are acquainted with the working of Samuel's patent back, for it is, in fact, nothing more or less. Instead of trusting, however, to the tin carriers for the exact position of the plate which is to be exposed, two brass supports are provided at the sides of the compartment, against which the face of the plate itself rests. In addition to these there are four movable supports touching the face of the plate in the four corners. These are attached to levers, which can be moved simultaneously by a cam in connection with an index concealed in the side of the box. The latter arrangement is used for focussing. It has the effect of pushing the plates further away from the lenses, the extent of movement being controlled by the cam and index named.

Suspended by hinges in front of the box is a flap, which has to do duty in three ways. When closed it protects the lenses from mechanical injury, and also keeps the light from them, while the shutter is being reset for exposure. When open, it forms a screen against top-light. It is also in immediate connection with the catch or trigger of the instantaneous shutter, which it releases as soon as it is opened sufficiently.

The shutter works between this flap and the lenses, and consists of a thin leather screen or curtain, with two holes corresponding with the lenses, through which the exposure is made. The upper extremity of this leather shutter is fastened to a light revolving cylinder, mounted just above the lenses. The latter contains a spring which can be wound up to a more or less degree by an index lever at the side of the box.

The action of this shutter is identical with that of an ordinary spring-roller window-blind. When it is being set for action, it

\* Read at the Camera Club.



is drawn down by a piece of catgut, which passes through the bottom of the box, and has a little knob at its end. There is a separate little spring-barrel for the catgut, which winds it back into the box when released, while the shutter is prevented from being re-wound on its barrel or cylinder by a catch, which can only be released by lifting the flap as above described. The time of exposure can be varied by this shutter from one-twentieth to a sixtieth of a second, according to the tension given to the spring in the cylinder.

Immediately behind the shutter are the lenses, which are a pair of Dallmeyer's rapid rectilinears, having an equivalent focus of four inches. The distance between their axes is three inches. They are mounted on a rising front, which can be moved up and down by an Archimedean screw, the end of which passes through the bottom of the box and carries an index.

The stops are all in one brass slide passing through both lens-tubes, which are slotted to receive it. There are eight apertures in the slide, four for each lens. A spring-catch is provided for locking the slide in four positions, in each of which two corresponding apertures are concentric with the lens-tubes. The value of the apertures is  $\frac{f}{8}$ ,  $\frac{f}{16}$ ,  $\frac{f}{32}$ , and  $\frac{f}{64}$ . The stops are shifted by an index in the bottom of the box; attached to this index is a pinion, which, by means of a rack and a lever, com-

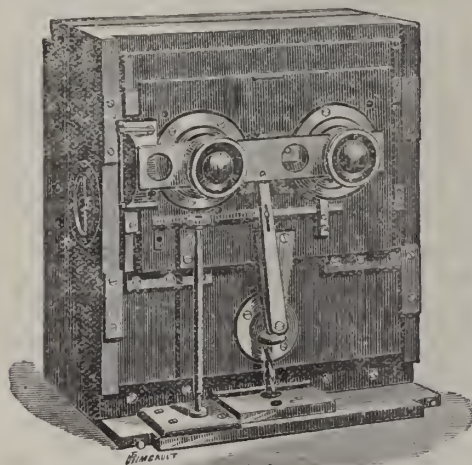


Fig. 1.

municates its movements to the brass slide (see fig. 1, which shows the interior of the camera without the shutter).

The only other arrangement to be described is one which enables the operator to make time-exposures. For this purpose a catch is provided in the same recess, which contains the index for the regulation of instantaneous exposures, which will lock the shutter when the two holes in it are opposite the lenses. The exposure is then made by lifting the flap to the full extent, in which position it will remain by itself during the exposure. It being necessary in such cases to place the camera on a stand, a brass socket is provided in the bottom of the box for a screw.

It will be seen by the above description that the box or camera contains all the elements necessary for taking any variety of subjects in or out of doors.

It may also be mentioned that the whole of the internal mechanism is attached to a light framework, which will slide out of the box when required, after simply opening the back. There are no bellows, nor any other arrangement for reducing the size of the camera when not in use.

It will also be noticed that care has been taken to construct this camera in such a manner that all the most essential adjustments are controlled from below. This is a most convenient arrangement, as the levers and indexes are out of sight, and yet always ready for action. Even the operator does not want to see them, for his sense of touch suffices to work them. The indexes for focussing and altering the time of exposure are necessarily in the sides of the box; but they are not often required, and are, therefore, hidden by thin, sliding covers.

With this camera, as with any other detective camera, an object or view has to be taken without seeing it, first on a ground-glass screen. Therefore, it is convenient to have a little view meter, which will help the operator to take up his position at the right distance from the object he is about to take. All

that is necessary for this purpose is a little tube about 1 inch in diameter and  $\frac{3}{4}$  inches long, with a thin plate fixed to one end, in which is a hole about  $\frac{3}{4}$  inches square. When the open end of the tube is placed closely against the operator's eye, he can see through the square hole at the other end of the tube how much of the subject is included in his picture. He will also fix in his mind the centre of the picture against which he has to direct his camera, and he will also see, by imagining a horizontal line through his picture at the same level where he stands, whether it is advisable for the front carrying the lenses to be raised or lowered. He makes the necessary change; the shutter and stops are supposed to have been set already; and all that remains to be done is to direct the box towards the central spot in the intended picture, lift the flap until he hears the shutter act, and the exposure is made. He then pulls the button or knob for changing the plates, resets the shutter, and all is ready for another exposure.

The focussing arrangement is not often required; it is, however, useful in cases where one wishes to take a near object or group. For this purpose it answers very well to ascertain how many paces are required to walk from the object to the spot from which the photograph is to be taken, and to set the focussing index to that number, the scale being divided for the purpose.

#### Printing.

In printing from a stereoscopic negative, two important conditions have to be considered. In the first place, it must be borne in mind that, through the well-known course of things, the two pictures on the negative are reversed—that is to say, the right-hand side of the view is on the left in each picture, and *vice versa*. A print from a stereoscopic negative has therefore to be divided in the middle, and reversed in mounting. The second condition is, that care should be taken to mount the two pictures in such a manner that the mean distance between the same object in each of the two pictures be not more than 2½ inches. If they are too far apart, most persons fail to combine the two pictures in the stereoscope, and therefore they cannot see the stereoscopic effect.

It is true that stereoscopes vary, and so do observers' eyes, and the distance between them; it is, therefore, impossible to make stereoscopic slides to suit everybody's sight. A happy medium has, therefore, to be adopted, and the condition given above I believe to be that medium.

A well-known method of printing from a stereoscopic negative is to cut the sensitised paper double the length of one print, and fold the two ends back, so as to meet the middle of the strip; then print both sides while the paper remains folded. The strip may hereafter be unfolded and cut through the middle, whereby two stereoscopic prints will be the result, each of which may be mounted in one piece.

However ingenious this method may be, it has its disadvantages, and can only be carried out when the two pictures on a negative are perfectly upright. But, when working with a detective camera, on account of the difficulty of holding it in a perfectly vertical position, the resulting pictures are seldom quite upright, which is a matter of indifference, provided one has the means of making them upright afterwards.

For this reason I have adopted the plan of cutting the negative in two halves, and afterwards fixing them, reversed, of course, in a printing-frame constructed for the purpose. The advantage of this plan is, that when the two halves of the negative are once properly adjusted in the printing-frame, any number of prints can be taken from them without further adjustment in mounting or otherwise.

For the purpose of cutting the negative, I have contrived a very simple tool. It consists of a thin board, a trifle larger than a negative, and what may be called a triple T-square (see fig. 2). The negative is placed face downwards on the board with a white paper between, and the T-square over it. It is then necessary to shift the negative so that the vertical outlines of buildings, or other objects in it, are parallel with the blades of the T-square. Three cuts are then made with a diamond along the three blades, the middle cut dividing the negative exactly between the two pictures.

It will be seen that by the adoption of this device, beside the two pictures being made upright, the distance between the similar objects in a finished print is determined by the distances between the three blades of the T-square. If, therefore, the latter be once properly adjusted, any number of negatives from the same camera may be divided without paying further attention to adjustment.



The printing-frame in which the two halves of the negative have now to be placed is an ordinary half-plate frame with a few additions. The first of these is a piece of thin plate glass for a support fitting the frame. Over this is laid a mask of thin card-



Fig. 2. *Printing-frame.*

board, also fitting the frame accurately, having a rectangular opening of  $5\frac{1}{2}$  by  $2\frac{1}{2}$  in. (These dimensions may have to be varied slightly for negatives taken in different cameras.) Next to the mask are four adjustable slides, as shown in fig. 3,

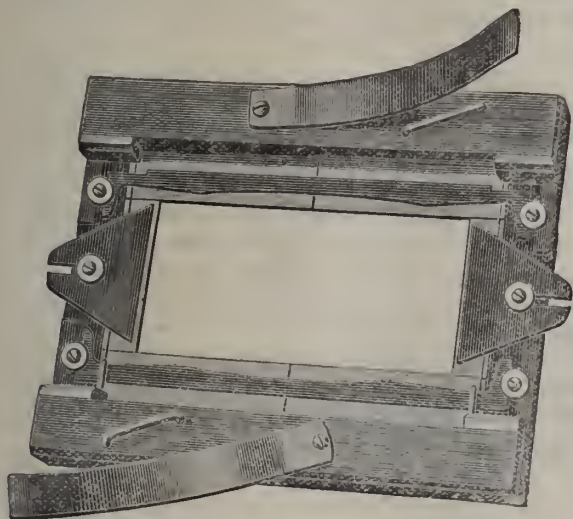


Fig. 3.

for the purpose of holding the two halves of the negative in position. These slides are made of sheet zinc, and must be less in thickness than the glass of the negatives.

#### *Transparencies.*

We now come to the most pleasing part of stereoscopic photography, which is the production of transparencies. These can be made with the aid of a stereoscopic copying camera, the advantage of this method being that the negative can be preserved as a whole, for the inversion of the two pictures is corrected by the second inversion, which takes place in the copying camera.

A copying arrangement of this kind is, however, an expensive item. It is, moreover, much more convenient to obtain transparencies by contact printing. The printing-frame above described is admirably suited for the purpose.

It must be borne in mind that a transparency made by contact printing must be viewed with the film side towards the observer, otherwise it will be seen reversed. A thin glass has to be put over it for protection, and in a transparency thus made it is impossible to apply the usual ground glass at the back without adding a third glass, which would be objectionable.

A transparency without ground glass, as just described, when viewed in a stereoscope, also without ground glass, while the same is held over a sheet of white paper, is, however, all that can be desired for effect, and is the cheapest and simplest form of transparency.

At the same time, it is not always convenient to hold the stereoscope over a white paper, and in that case the coarse ground glass in the stereoscope, and the fine ground glass at the back of the transparency, are necessary, for the diffusion of light.

Transparencies of the latter description can be obtained by proceeding as described; but instead of using plates of the usual make, to have special plates prepared of ground glass with the film on the polished side.

The transfer papers lately introduced, such as Eastman's transferotype, make also very good stereoscopic transparencies. The paper, in this case, is printed by contact, and after development squeezed on to a glass on which the film remains after the removal of the paper support.

Looking at the film side of such a transparency, the picture is reversed, and in order to see it like its original it has to be turned round so that the film is at the back of the glass. This is, however, precisely what is wanted for a stereoscopic transparency, for all that remains to be done is to put a plain or ground glass behind it according to taste.

#### *Multiple Stereoscope.*

I have now to say a few words respecting the best way of showing a collection of stereoscopic transparencies to a number of persons. Anyone possessing a large number of transparencies, arranges them, naturally, in a certain order, in which he desires to show them. Or it may be for the purpose of easily finding any particular one or other. He can certainly have several stereoscopes, and hand them round with pictures, but the consequence of such a plan is that the latter will not be returned to him in the same order as given out, and his collection will be subjected to confusion.

Bearing in mind this inconvenience, and also the fact that all attempts to enable a number of persons to view the same stereoscopic picture simultaneously, having failed, I have constructed what may be called a multiple stereoscope, which I find exceedingly convenient for exhibiting transparencies. (See fig. 4.) It



Fig. 4.

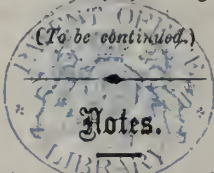
consists of a light five-sided box, with five stereoscopes arranged around it. It could, of course, be constructed for any number. One of the sides of the box opens on hinges, and gives access to the interior, where there is a framework capable of revolving on a central pivot. This framework is so constructed that five transparencies can be placed on it, so that each of the latter is viewed through one of the five stereoscopes. The framework surrounds a white disc, against which the stereoscopes are directed, and which is illuminated by a lamp suspended in the centre. This disc revolves with the framework, and is provided with five notches, into which engages a spring-lever,



locking it in five positions where the transparencies or pictures are opposite the stereoscopes.

The change of pictures takes place through the side of the box which opens, and after each change the spring-lever is withdrawn, while the disc is advanced one-fifth of a revolution, so that each picture has to travel round from one stereoscope to the other.

When constructing this instrument, I soon found, however, that it was extremely unpleasant and even painful to the eyes to look in one of the stereoscopes while the change of pictures took place. I had, therefore, to provide all the lenses with shutters, which close automatically during each advance of the inner framework.



At the last meeting of the Photographic Society of Great Britain the blackboard was not only more than usually repellent of chalk, but exceptionally retentive of a mark once made. Consequently the reader of the paper was placed at a very unfair disadvantage in his strenuous endeavours to convince the audience that a ship at a distance of one mile, and a similar ship at a distance of two miles, would come out the same size on the focussing-screen.

During the demonstration of this and other remarkable doctrines, it became painfully apparent to the audience that the extra pressure necessary to make the board take the chalk, and the still greater pressure required to wipe off the marks once made, were like to overturn the whole arrangement against the water colour paintings on the walls. Indeed, the expectation of such a catastrophe so far diverted the attention of the audience that we fear some still remain unconvinced about the ship doctrine.

The assistant-secretary, however, hastily erected a temporary fortification behind the blackboard, this fortification consisting of a pair of steps, two boxes, a desk, and the top of a table.

Things now went fairly well until the reader of the paper was engaged in instructing T. R. Dallmeyer as to the proper way of making a portrait lens, when the fortification showed signs of giving way; but, equal to the occasion, the assistant-secretary rushed behind, and caught the black board just as it was falling. He then readjusted the various articles, but made the mistake of leaning them, buttress fashion, against the blackboard, the result being that, just as the meeting was over, the whole fell forward with a loud and alarming crash. Perhaps, after this, the Photographic Society will take our oft-repeated advice, to obtain a new blackboard and a firm stand.

When we referred to the political lantern lectures which are now becoming so popular, doubtless many of our readers wondered how it is that the other side does not take advantage of the darkness, and so far disturb the lectures as to render the delivery of the lecture impossible; but the solution probably rests in the fact that the other side is practically absent from political lectures; in fact,

Conservative lecturers lecture to an audience consisting mainly of Conservatives, and the Radical lectures to one almost entirely composed of Radicals.

In the case of Sir Charles Warren's lantern lecture on Palestine, which was commenced but not finished at the Oxford Music Hall last Sunday, the case was different. The lecture being non-political the audience was a mixed one, and as soon as the lights were turned down, those who happened to disapprove of Sir Charles's municipal policy began to somewhat loudly express their views. The Chairman raved, and said he would have the lights turned up and the disturbers arrested; but when the lights were turned up the police did not know whom to arrest, and at the same time the show was stopped. The practical lesson is, never to undertake a lantern exhibition unless there is a probability of a large majority of the audience being friendly.

Another photographic association is about to be initiated at Sheffield, the Sheffield Camera Club, and it is thought that it will prove a success. The older society has many elements of weakness and discord in its composition, and the founders of the Club think that to commence again is, in this case, better than to reform.

It would be interesting to know what equivalent Messrs. Braun, of Dornach, gave to the National Gallery authorities in return for the privilege of being allowed to photograph the principal pictures. We presume the transaction, so far as Messrs. Braun were concerned, was a commercial one, and that they did not undertake the work out of pure love for art. The outcome to the British public has, so far as we know, amounted to nothing at all; but if one arrangement had been made at the time for the supply of copies at special terms for distribution to the various public libraries, a valuable educational boon which have been conferred upon the nation. No doubt Messrs. Braun would have acceded to some arrangement of this kind. Perhaps, it is not now too late.

One of the States of America has put its foot down upon the growing nuisance of publishing portraits of well-known persons in connection with advertisements. In consequence of a patent medicine vendor using the portrait of Mrs. Cleveland, the wife of the President, as a means to puff his nostrums, the State in question has passed a law making it a penal offence to use any portrait for this purpose without permission. We do not know whether those ladies whose whole thoughts are apparently directed towards the virtues of a certain soap gave permission for their countenances to be used, or whether they derive any pecuniary advantage from the exhibition of their faces in omnibuses and in newspapers. It does not very much matter, as in their cases the public may be the gainers, a pretty face being pleasant to look upon. But it is a very different matter when patent medicine vendors publish portraits of the patients who, it is alleged, have been cured by their remedies. One picture from a photograph has already made it appearance.



It is that of a repulsively ugly woman, and bears the title of "Snatched from the jaws of death." This is only the thin edge of the wedge. It is but an easy step from the photograph of the convalescent patient to the photograph of the person before he or she took Dulcamara's Patent Pancreatic Pill; and when this kind of thing is once started, our newspapers will be full of horrors. We hope the hint will be taken by proprietors of newspapers, and that they will exercise some kind of check on the growth of an unpleasant practice.

The impression Sir David Salomons was under at the last meeting of the Photographic Society, that slips of his paper had been circulated among the members, was a very natural one. We have on former occasions pointed out how desirable it would be if this practice were adopted in cases where papers abound with technical, and especially mathematical details. Some societies do this, as Sir David Salomons mentioned in apologising for the numerous printer's errors which appeared in the proof he was reading from, copies of which he imagined were in the hands of his audience.

The recent Photographic Exhibition in St. Petersburg appears to have been a success, not only from a technical point of view, but also socially; His Majesty the Tsar having lent his support. To L. Warnerke is due the credit of the excellent general arrangements.

Photography is a very popular pursuit in the Russian capital just now, its popularity being, perhaps, largely a result of the Tsar himself being an ardent amateur of photography.

Speaking of the camera in Russia, we may refer to a very excellent hand-book or reference book of photography, written in Russian, by V. Sreznevsky, and published by Evdokinoff, of 11 Bd. Italienskia, St. Petersburg. About sixty pages are occupied by a concise dictionary of photography, after which we have chapters on laboratory practice, optics, and other special subjects; also a large fund of information conveyed in tabular form. Of course, it is quite unreasonable to expect that any number of photographers will learn Russian for the sake of reading this and other works on photography; but for the benefit of those who may have collateral inclinations to learn Russian, we may mention that a Russian class now meets at the City of London College on Monday evenings, and several persons interested in photography are at present members of the class.

## Review.

RETOUCHING MADE EASY. A practical guide. By J. Hubert. Price not imprinted, but stated to be 1s. 6d. (London: Published by the Author at 238, Mare Street, Hackney, 1888)

ALTHOUGH we have here quite a small pamphlet—only eighteen crown octavo pages—it is, we are bound to say, likely to be far more useful to the photographer than some

of the larger works published. It is concise and thoroughly practical, evidently written by a skilled workman.

Eighteenpence certainly seems a high price for so small an amount of printed matter, and the author might certainly have swelled the same information into a hundred page book; but this would have proved a greater impediment in the drawer of the retouching desk, and moreover, the finding of any desired information might have been less easy.

## ON THE PHOTO-CHEMICAL ESTIMATION OF GRADED TINT.

BY EDMUND J. MILLS, D.Sc., F.R.S., AND J. BUCHANAN.\*

IN the estimation of differences of degree of the same tint, it is customary to depend upon eye estimations, and in many cases to use colorimeters as a means of instrumental comparison. Quantitative determinations can thus be made on amounts of matter so minute as to be altogether unamenable to gravimetric investigation. Numerous instances, however, might be adduced in which our ordinary resources fail, or can be applied only in, at best, a very circuitous manner. Our attention has been in particular directed to the comparison of tinctorial effect upon dyed goods: and for this we have devised an artifice which we believe may be useful in many other directions of experimental inquiry. The artifice consists essentially in photographing on an isochromatic plate, and at one operation, equal-sized pieces of tissue, exhibiting different degrees of the same tint. A negative is thus obtained from which any number of prints can be produced on "gelatino-bromide" paper, and each impression represents definitely in terms of silver the original grade of tint. All that is necessary is to make a sufficient number of impressions to enable the silver to be determined either volumetrically or gravimetrically.

In our experiments pieces of cashmere of known weight were dyed in "vats" of known strength and constant temperature, the proportions of colouring matter or mordant being varied.

These pieces were mounted side by side on cardboard, and over all of them was mounted a second cardboard, pierced with round apertures of equal diameter. From the photographic negative a large number of prints were taken on Eastman's Bromide Paper A. These prints were each exposed for the same length of time, and were, as far as possible, developed under the same conditions. The exposure was so timed as to produce but a slight effect only, where a slight tinctorial effect had to be represented. They were allowed to remain a much longer time than usual in the fixing-bath, to make certain of the complete removal of silver salts, and were then washed all night in running water. After drying, all the discs of one tint were cut out, incinerated in a porcelain crucible, and the ash treated with nitric acid free from chlorine. The nitric solution was evaporated completely to dryness, the residue dissolved in distilled water and again evaporated to dryness. The silver salt was then redissolved in distilled water, washed into a small flask, and made up to about 20 c.c. with water. A few drops of a solution of neutral potassic chromate, free from chlorine, were then added, and the solution was titrated with centinormal sodic chloride. On reaching the point where the colour of argentic chromate disappeared, the solution was titrated back with centinormal solution of argentic nitrate, and the mean of the two results was taken.

### First Series.

In the first series of experiments the specimens photographed illustrated the effect of varying the quantity of mordant (potassic bichromate) in dyeing wool with logwood.

The composition of the "vat" used was—

Wool...	...	...	...	100 parts
Logwood extract	...	...	...	8 "
Water	...	...	...	10,000 "

Temperature 90° C. Time, 1 hour.

The quantity of mordant ranged from .25 to 3.00 parts.

The discs used were seven in number, and had a uniform diameter of nearly 25 mm.

The size of the discs on the recipient plate was very nearly 7.02 mm. From this negative 250 prints on "Eastman Paper A" were taken; the time of exposure being 45 secs. at 4 ft. from a No. 4 burner burning about 22-candle gas.

\* A Communication to the Society of Chemical Industry.



The prints were then treated as already stated, and the following quantities of silver were obtained :—

A.	B.	C.	D.	E.	F.	G.
3.13	2.50	1.72	1.08	.65	.54	.166 m. grm.

The corresponding values of mordant were—

A.	B.	C.	D.	E.	F.	G.
3	2	1.5	1	.5	.375	.25

These numbers agree fairly well with the equation—

$$y = \frac{\beta(x-c)}{1 + \gamma(x-c)},$$

where  $y$  = silver deposited,  $x$  = mordant,  $\beta = 1.7890$ ,  $\gamma = .21354$ ,  $c = .15660$ .

TABLE I.

$y$						$y$ calc.
3.13	...	...	...	...	...	3.17
2.50	...	...	...	...	...	2.37
1.72	...	...	...	...	...	1.87
1.08	...	...	...	...	...	1.23
.65	...	...	...	...	...	.57
.54	...	...	...	...	...	.37
.166	...	...	...	...	...	.16

Probable error of a single comparison, .09 m. grm.

When  $x$  is very large,  $y = \frac{\beta}{\gamma} = 8.3778$ . The amount of

silver actually present on the paper was 22 m. grm. It is evident that  $c$  represents the amount of mordant necessary in all cases before any tinctorial effect is produced.

#### Second Series.

In this series the number of different tints photographed was 10. Here the weight of the mordant was constant, while the logwood extract was varied. The "vat" employed in mordanting was—

Wool ...	...	...	...	...	100 parts
Potassic bichromate ...	...	...	...	...	3 "
Water ...	...	...	...	...	10,000 "
Temperature 90° C. Time, 1 hour.					

The quantities of logwood extract ranged from 0 to 8 parts. The size of the discs was 25 mm., and their size as photographed 7.02 mm. very nearly. The time of exposure of the points in this case was one minute, the other conditions being as in the first series. 250 prints were taken in this case also. The following quantities of silver were obtained :—

	A.	B.	C.	D.	E.	F.	G.	H.	I.	J.
Silver...	3.62	2.92	2.37	1.62	1.4	1.083	.59	.32	.27	.11
Logwood ext.	10	8	6	4	3.5	3	1	.5	.25	0

As the quantity of silver obtained in J was due to the colour produced in the wool by the mordant, this number (.11) was subtracted from the others, giving—

A.	B.	C.	D.	E.	F.	G.	H.	I.	J.
2.91	2.81	2.26	1.51	1.29	.97	.48	.21	.16	0

These numbers, in most cases, agree pretty closely with the equation—

$$y = \frac{\beta x}{1 + \gamma x}.$$

Where  $y$  = silver deposited,  $x$  = logwood ext.,  $\beta = .513$ ,  $\gamma = .07778$ .

TABLE II.

$y$						$y$ calc.
2.91	...	...	...	...	...	2.89
2.81	...	...	...	...	...	2.63
2.26	...	...	...	...	...	2.10
1.51	...	...	...	...	...	1.57
1.29	...	...	...	...	...	1.41
.97	...	...	...	...	...	1.25
.48	...	...	...	...	...	.48
.21	...	...	...	...	...	.25
.16	...	...	...	...	...	.13
.00	...	...	...	...	...	.00

Probable error of a single comparison, .08. We have satisfied ourselves that this is very nearly the probable error of the volumetric method. When, in the second equation,  $x$  is very large,  $y$  reaches 6.5955 as its ultimate limit.

## THE HYDROQUINONE DEVELOPER.

BY G. A. KENTON.\*

THE hydroquinone developer has been before the public for some years, but so many contradictory statements have been made as regards its utility, that there has been little encouragement for those who have little time for experiment to take it up. About the end of last year, however, two important communications were made almost simultaneously, concurring in setting forth certain advantages appertaining to this form of developer—the one by Mr. W. F. Donkin, at the meeting of the Photographie Society of Great Britain, published in the *British Journal of Photography*, December 30, 1887, p. 830; the other by M. Balagny, published in the "Correspondence" column, the *British Journal of Photography*, January 13, 1888, p. 30. Substantially, the formulæ in each case are identical, except that Mr. Donkin recommends the addition of a bromide, and M. Balagny insists on the absence of bromide, attributing non-success to its use.

Another matter which makes one nervous about taking up this substance, is the uncertainty one feels of getting the proper sort of hydroquinone, which appears to vary very much in quality. However, a sample obtained at random from Chapman, of Manchester, has proved quite satisfactory. Then, again, it is stated that however well the developer may act with some plates, it will not act satisfactorily with others. Then, some writers speak of the developer acting very slowly, and appear to recommend it only for lantern plates; also of the hydroquinone dissolving in water with difficulty, which may be overcome by dissolving it in alcohol.

The next question which presented itself was, how far can the solutions already in use be employed? This I found very simple, the said solutions being :—A. Sulphite of soda solution, 2½ to 16 ounces. B. Washing soda, 1 pound to 80 ounces, Winchester quart. C. It only remains to dissolve some hydroquinone in the proportion of xij grains to 3iv of rectified spirits of wine (3ij would suffice, but 3iv is easier to subdivide accurately). D. Bromide of ammonium, 100 grains to the ounce.

Then half a drachm of C with 5 drachms of B and 5 drachms of A represents M. Balagny's developer, and the same with 3 minims of D represents Mr. Donkin's.

**First Experiment.**—An instantaneous plate was exposed under a strong negative, two feet from a gas flame, for fifteen seconds; Balagny's developer, as above, was applied. In one minute the image appeared and proceeded rapidly, and buried in fog, showing either over-exposure or need for bromide, or both.

Another plate was exposed in the same way, and the identical solution with miiij of bromide added to it; result showed a good image. A subsequent experiment showed that with Fry's Kingston slow plate and appropriate exposure, a perfect freedom from fog is obtained without bromide, and with freshly mixed solution, in the course of less than five minutes.

**Third Experiment.**—One of Fry's lantern plates, exposed under a strong negative and developed with the same solution; result, a brilliant transparency. The solution answers well also with bromide paper. It can be used over and over again, but for very short and instantaneous exposures should be freshly prepared. It is claimed for this developer that any amount of density may be obtained; that, in short, it is a more powerful developer than pyro, but less greedy and irregular in its action. It has also a powerful tanning effect on gelatine, which requires to be borne in mind when used for stripping films, and which will render it very useful with plates inclined to blister, being a complete preventive of anything of that kind.

The proper way to use the solution would be in a porcelain or glass bath, with grooves and a close fitting cover, so that a number of plates might be developed at once or as required. It does not stain the fingers, and is especially recommended for instantaneous exposure, as however small the incidence of light, the effect desired will be obtained in time. My experiments tend to confirm all the above points, and contradict none. The subject is one well worthy of the attention of our fraternity.

## Patent Intelligence.

### Applications for Letters Patent.

6,377. THOMAS TURNER, 58, Low Street, Keighley, Yorkshire, for "Improvements in means for illuminating objects for photographic or similar other purposes."—April 30th, 1888.

\* A Communication to the Liverpool Amateur Photographic Association.



6,417. JOSEPH JOHNSON, trading as Johnson Bros., and JOHN DEAKIN, 7, 8, and 9, George Street, Parade, Birmingham, for "Improvements in metallic easels or stands for photographs and other like articles."—May 1st, 1838.

6,429. HARRY LUCAS, Tom Bowling Lamp Works, Little King Street, Birmingham, for "An improved photographic dark room lamp."—May 1st, 1838.

6,519. JOHN NEWTON MARTIN, 20, Laurie Grove, New Cross, S.E., for "A silver or other metal-backed hair brush, so constructed as to contain a photographic portrait."—May 2nd, 1838.

6,533. HARRY WILLIAMSON TEED, 45, Southampton Buildings, London, W.C., for "Improvements in and relating to photographic shutters."—May 3rd, 1838.

Patent which has become Void through Non-payment of the Fourth Year's Renewal Fee.

1,893 of 1884. C. SANDS, and another.—Photographic cameras.

Patent on which the Fourth Year's Renewal Fee has been Paid.

6,893 of 1831. H. J. REDDING.—Pocket ruby lantern.

#### Specifications Published.

10,841. JOSEPH LONDON BERRY, of 43, Cardiff Street, Aberdare, in the County of Glamorgau, Photographer, for "Combined clamp and tripod head for carrying photographic cameras or other like purposes."—Dated August 8th, 1887.

The patentee says:—

I construct a screw clamp in the ordinary manner to which I affix two arms by hinges, or otherwise the said arms and also the aforementioned clamp being provided with means whereby the legs of the stand can be attached thereto. The clamp portion of my invention has at one end two projecting plates, between which the folding arms swing by means of holes and a pin or otherwise, such arms having two lugs at their outer ends with pins for the purpose of affixing the legs when used as a tripod, two lugs being also affixed on the body of the clamp for the same purpose.

The clamp and the arms together when unfolded forming a tripod head which can also be used as a support for a camera or other like purpose without the legs by using it clamped to a gate or post, or any convenient support, by means of a screw provided at the end opposite the end where the arms are attached.

The projecting plates of the clamp which carry the arms are also pierced with a hole to receive the screw by which the camera is to be attached to the combined clamp and tripod head.

The folding portions can also be constructed without the clamp portion to use simply as a folding tripod head, or as a folding clamp without the provision for the legs.

### Correspondence.

#### ACCIDENTAL DESTRUCTION OF NEGATIVES.

SIR,—Debenham and Gabell v. Morgan and Kidd. I have read the report of the above case in your paper of this day, and ask leave to add a word or two.

The Judge, in holding that the defendants were not protected by the note in their price list to the effect that they repudiate responsibility for accidental damage, was enforcing the rule laid down in *Simon v. G.W.R.*, and *Peck v. North Staffordshire R.*, viz.:—"A notice exhibited will not establish a special contract. The special contract must be signed, and the substance of it brought home to the person signing." The damage in this case, though no doubt accidental, might certainly have been avoided by proper care, the negative having been returned unpacked.

A feature in the case not quite satisfactory to photographers was the small amount of damages given. Judges will not take into consideration the prospective value of a negative for future orders, and though it was proved in this case that such orders provide a very large proportion of business (an average of three months showing one-third of the total business receipts), he gave nominal damages merely. It is this that constitutes the true commercial value of a negative. This hardship renders it all the more necessary to exercise the greatest care in preserving a negative from injury.

The principle governing the case is as follows:—"A workman for hire is not only bound to guard the thing bailed (*i.e.* entrusted) to him against ordinary hazards, but likewise to exert himself to preserve it from any unexpected damage to which it may be exposed" (*Leck v. Morcster*, 1. Camp. 138).—Yours obediently,

S. J. DEBENHAM, Plaintiffs' Solicitor.

35, Southampton Buildings, Chancery Lane, W.C., May 4.

#### DIFFUSION OF FOCUS.

SIR,—In Mr. Debenham's letters I find nothing but a biased effusion; having made an assertion, he intends to stick to it at any cost. He disputes my first claim by making an assertion that he cannot prove either by practice or theory. Practice and theory, however, both uphold the claim (see my previous letters and Mr. Grubb's corroboration).

Of my second claim he alters the sense, and tries to score tersely, but unfairly, by not quoting it in conjunction with the previous paragraph, in which I point out that the absolute gain is on the side chiefly dealt with in portraiture as shown in Grubb's diagram. To the third claim he assents with qualifications.

This is followed by a very feeble paragraph, for within the limits of definition required in portraiture, it is usually a matter of inches in foreground to feet of background that are required for sufficiency of definition.

To continue, I had nothing to do with Mr. Chapman Jones' letters: what is the use of such a reference? However, I may say (as Mr. Chapman Jones has wisely resigned further argument—and I am sure his letters were written without bias of any kind) that he is perfectly right, and that Mr. Debenham does not grasp the situation at all, for as the words stand, "the gain within the focal point is not disputed," exactly states the case, for planes within the focal point correspond to objects in the background.

I understand Mr. Lake Price to be an authority, and as such I esteem his support.

To introduce other makers' instruments into the question, whether imitations or not in optical construction, is entirely irrelevant. Of Mr. Debenham's other remarks as to the introduction of the lens itself, I reserve my opinion.

In conclusion, I have only to repeat one other point in connection with this subject of diffusion of focus—entirely ignored, as might be expected, by Mr. Debenham—viz., that in the lens used intact (or a lens perfectly corrected for positive spherical aberration) there is and can be only one point perfectly defined, and the remainder entirely out of focus. In the other case, by introducing positive spherical aberration in the lens, there are wide limits of partial definition corresponding to both background and foreground. With regard to the former condition (*i.e.* in reference to background), the two lenses will not bear comparison, so much is the advantage on the side of the uncorrected lens. With regard to foreground (within the limits necessary for a portrait) and the definition in the out-of-focus planes, there would not be much to choose, as the outward concentration of the rays (on this the disadvantageous side) would not become apparent unless the distance within the point focussed on were considerable.

My line of argument has been *facta non verba*, and I have substantiated the claims made by my late father for his portrait combination.

I think further waste of your valuable space by repetitions unnecessary, and I cannot personally afford the time to further educate Mr. Debenham on the subject.—I am, yours, &c.,

THOS. R. DALLMEYER.

#### COMPOSITE PORTRAITURE.

SIR,—As the accredited originator of what are now known as composite portraits, it might go without saying that I am an interested spectator of the progress and utilization of the procedure in its various forms. Your correspondent who has sent you the composite groups of the present political leaders is to be con-



gratulated on having adapted it in a practical manner to a side issue of political life. On his part it was, possibly, an intentional feature, lending humour to the presentment, to give exceptional prominence to the leading personage of each group. For of what use is a leader if he does not lead? And, although the tail may sometimes wag the dog, is it not the dog's own self that gives potency to the wagging? If such, therefore, was your correspondent's intention, well and good.

In a former communication of mine, under date October, 1885, it was pointed out that the introduction into a group of a second portrait of one and the same person would naturally eventuate in that particular portrait becoming the dominant of the series, and that this would happen whatever might be the period of time which had elapsed between the dates of the two sittings. From this circumstance it would necessarily ensue that personal identification might, in cases of doubt, be effectually and judiciously determined, always presuming the requisite photographs to be accessible.

Of the modes of operating which have been variously followed by experimenters, I would here observe that the method of superposing the adapted negatives with geometric accuracy—though limited in its range of components—will still be found to yield the most efficient class of results. Other things being equal, that is the true mode of obtaining not merely an aggregate agglomeration of the components, but the true meaning of the whole series, and a sharp and effective reproduction.

Bristol.

W. MATHEWS.

### INSTANTANEOUS SHUTTERS.

SIR,—In an article by Mr. H. R. Procter, in your number of 27th April, it is stated that the Phoenix or Phantom shutter was first introduced by Messrs. Reynolds and Branson, of Leeds. This statement is no doubt made under the belief it is correct, but I wish to state that this type of shutter was devised by Mr. Roberts, of the Liverpool Amateur Photographic Society, and a large number of them were made by Wood and other makers in Liverpool, and to this day the shutter is known as "Roberts's." I can state further that Messrs. Reynolds's traveller borrowed one of these shutters from Mr. Henry Sampson, of this town, and afterwards they brought it out with additions under their distinctive name.—Yours truly,

BENJAMIN BOOTHROYD.

8th May, 1888, 151, Lord Street, Southport.

## Proceedings of Societies.

### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE ordinary monthly meeting of this Society was held on Tuesday evening last, the 8th inst., the President, J. GLAISHER, F.R.S., in the chair.

It was announced that the apparatus belonging to Sir Howard Grubb, which was to have been exhibited on that occasion, had had to be returned to Dublin, and, therefore, the business of the evening would begin with the paper by Sir David L. Salomon, which stood upon the notice as the second subject.

SIR DAVID SALOMONS then read his paper on "Theoretical Considerations in Exposures." He would, he said, confine himself to the lens and to deductions connected with it. The relation existing between aperture and equivalent focal length was usually expressed by  $f$  over the number representing the quotient when  $f$  was divided by aperture. Some called this relation intensity, and others called it ratio; but neither expression was strictly correct, and he proposed to call the relation "function," and write it  $f$ —as an  $f$  with two strokes. To describe the effect of colour in the glass and of reflection from several surfaces, both of which causes would make the lens slower than it would otherwise be, he proposed a further expression  $e$ , representing efficiency, so that the true indication for exposure would be set out as  $\frac{f}{B}$ — $B$  representing the relation of aperture to focus. To find the value of efficiency he recommended the use

of a Bunsen photometer, with such modification as would be required for the particular case. The efficiency of the lens could thus be ascertained by noting the amount of light which it transmitted, and  $e$ , its amount, should be engraved on the lens tube. Any stop marked 10, for instance, would then require the same exposure as any other stop marked 10 belonging to another lens.

**Depth of focus.**—Where this was great it had a bearing on the exposure. The expression (depth of focus) he defined as the space between the planes outside the camera, wherein all objects can be focussed on the screen, no objects being represented by circles of confusion exceeding  $\frac{1}{100}$  of an inch. As an image became smaller, so its light became more intense; but for this fact we should not perceive the fixed stars. This means that the more distant an object is from the lens the more brilliant it should be upon the screen. If there were no air absorption this would be the case. In practice we find that the more distant an object is from the eye, the duller it appears; the loss of light depending upon the state of the atmosphere. After moderate distances the image loses in light instead of increasing in brilliancy, as it would do if absorption did not exist. Artists and photographers use the expression "atmosphere" in a truly scientific sense, although innocent of the truth they express. Objects moved along a line between the planes of depth of focus, whether they are close together or infinitely distant, do not appreciably alter their size in the image, so that but for air absorption there would be no way of appreciating distances between those objects which are sharp in the picture. But for the existence of this power of air, objects in the distance would appear as so many dazzling electric lights on the ground glass. In the studio air absorption plays no appreciable part, although photographers are aware that very small pictures, taken with long focus lenses, are wanting in brilliancy, and this is due to air absorption. The position of the optical centre of a lens he would also have engraved upon the lens mount. There was one other point with regard to depth of focus. Where lenses had curved field, objects might, towards the margin of the field, be in a nearer plane, and yet be in focus. It would be desirable to have a lens whose field was curved in the contrary direction, so that, for instance, in photographing a large head, the ear which was backward from the lens, and more towards the margin of the field, might be in focus at the same time as the nose, which was forwarder and more central. Mr. T. R. Dallmeyer had informed him that such a thing was possible, and they might expect soon to have a lens possessing this characteristic.

W. E. DEBENHAM said there were several points in the paper which deserved notice or challenged criticism. In the first place, the author said that the expression of the ratio of aperture to focus, did not truly indicate the rapidity of the lens, and proposed to get at this by testing with a photometer, in order to allow for light lost by reflection and absorption. If we are to have a fresh element introduced into our calculation, let it at least be as accurate as may be. Now the photometer test would be misleading, as taking account only of the visual power of light transmitted; whereas with different varieties of glass, the visual and chemical value of light transmitted was not the same. Then, again, the loss of light by reflection from several surfaces might not necessarily involve increased exposure in the camera. Some of the light thus reflected won't reach the plate over its entire surface, and by acting as what was called auxiliary exposure, neutralise, or more than neutralise the slowing effect due to loss of light. The author's definition of depth of focus, if accepted—and he did not know that any better definition of depth of focus had been put forward—disposed at once of any pretensions to increased depth of focus being obtained by the introduction of spherical aberration, since with spherical aberration the distance between planes having circles of confusion of any given size is unquestionably less than when the lens is perfectly corrected. Then they came to the statement that "as the image is smallest so is its light more intense, and that but for this law we should not perceive the fixed stars." The members were not all astronomers, and it would doubtless have been interesting to have the authority for the statement.

SIR DAVID SALOMONS: "Tyndall."

W. E. DEBENHAM, continuing: Not merely the name of an author, but a quotation. Perhaps, however, some other member would go more into that subject. The statement that "artists and photographers used the expression 'atmosphere' in a truly scientific sense, although innocent of the truth they express," he thought not justified. He considered that artists and photographers did know what they meant by "atmosphere." They meant the illuminated particles in the air which interposed



between the spectator or the camera and the subject, and which, therefore, in proportion to the distance of various parts of the scene, made it appear misty, and so gave the effect of distance. The most extraordinary statement in the paper, however, was that "any object moving along a line between the planes of depth of focus, whether they are close together or infinitely distant, do not appreciably alter their size in the image." According to this, a ship, for instance, one mile distant would be represented in the camera of the same size as if it were two miles off. As to the desirability of a lens having a field convex to the lens, that had been long recognised, and in the early volumes of the Society's Journal it was mentioned as having been accomplished. The difficulty, however, was that in so far as overcoming the normal curvature of field, so much spherical aberration or astigmatism had accompanied it as to seriously injure the definition. If perfect flatness or reversed curvature could be obtained without this drawback, it would be a great gain.

Capt. ABNEY said there were one or two questions that arose in his mind on hearing the paper. He did not quite understand what the photometer was stated to be. Bunsen's photometer depended upon a grease spot; no allusion had been made to this in the paper, although the photometer was called Bunsen's. It looked as though the lights were to be compared visually on two screens. In this case, the probable error due to observation alone would exceed ten per cent. Then they had to consider that for efficiency they ought to have not only the visual, but the photographic value of the light, and this should be ascertained by a photographic method. Lenses, too, might have a certain efficiency to-day, and quite another in a year or two's time from a change in the glass. The relative efficiency of lenses also would not be the same in summer and in winter. Considering all these differences, he would prefer not to have "efficiency" marked upon his lenses. Photographers did not always wipe their lenses with wash leather before use, and the efficiency would vary with the amount of dirt there might be upon them. Then there were one or two errors later in the paper. The statements about the stars, and the brightness resulting from distance, so that "but for air-absorption distant objects would appear as dazzling electric lights on the ground glass," was a mistake. Brightness is the same at whatever distance, supposing, of course, the object to be outside 100 focal lengths, so that no shortening of the camera focus is involved; the absolute brightness is the same at any distance. There was also an error in the statement that objects moved along a line between the planes of depth of focus did not alter in size. Take a ball, say, six inches in diameter, and it would, whilst moving along this line, appear larger as it approached the camera, and *vice versa*. There were one or two other errors which he need not go over, as Mr. Debenham had pointed them out. He hoped it would not go forth to the world at large that the Society accepted statements which were absolutely wrong, scientifically as well as practically.

T. R. DALLMEYER had not much to add to the objections brought forward by the other speakers. He perfectly agreed with both of them, that the tests of an ordinary photometer would be inaccurate. He would prefer fitting lenses to a camera in the stereoscopic fashion, and focussing some diffused light. Then, by the use of varying diaphragms, the lenses might be brought to one efficiency, and a calculation from the size of the diaphragms would give the efficiency of the lenses. Another important point was the question of equality of illumination. When a photographer used a double lens, and then with one of the lenses of the combination used the same sized stop, he found that the exposure required was nothing like four times that of the double lens. This was from the equality of illumination being greater with the single lens. As to the formula for ascertaining depth of focus, which Sir David Salomons acknowledges taking from his paper, but had put in a different form, he preferred the form in which he had originally put it. As to flattening the pit of the lens, it was quite true, as stated by Mr. Debenham, that the difficulty lay in the amount of astigmatism that accompanied the correction. On this account he sometimes rejected a lens for having too flat a field, the astigmatism being then too great to be tolerated. With all these questions of depth of focus and exposure, it was assumed that they were dealing with central rays. If they were treating of marginal rays, complications of varying amounts would arise. With regard to the question raised as to depth of focus in connection with spherical aberration, he need not waste the time of the meeting further, since the subject was not before them.

Sir DAVID SALOMONS, in replying, said that he had assumed that lenses were corrected for chromatic aberration, and of glass

as colourless as could be obtained; also that the lenses were as thin as might be. He was not quite clear as to the effect of reflections referred to by Mr. Debenham; he did not say whether he was wrong or right. Several speakers had mistaken what he meant when he had said that images did not vary in size when between planes of depth of focus. He proceeded to draw upon the black board, when Captain Abney interposed with a remark, and Sir David Salomons then said that he saw that he was wrong when near objects were in question, but not for those which were far off.

W. E. DEBENHAM asked whether then in the case he had put of a ship one mile away or two miles, Sir David Salomons maintained that it would appear of the same size on the plate.

Sir DAVID SALOMONS replied that it would, unless the lens were of so long a focus that the focal length would have to be altered to bring the images both within the plane of depth of focus. He hoped shortly that they would have the lens with reversed curvature of field, as Mr. Dallmeyer had intimated to him he would be in a position to produce such an instrument.

T. R. DALLMEYER rose to correct the speaker. He had not said so.

Sir D. J. SALOMONS regretted that he had misunderstood Mr. Dallmeyer.

The President, in proposing the customary vote of thanks, said that he did not doubt that the author would devote more study to the subject, and in time would come before the Society again, and give them the results of his deeper thought.

S. R. Brewerton was declared to be elected a member, and the meeting then adjourned.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The usual weekly meeting was held on the 3rd inst., W. BEEFORD presiding.

A question from the box was read: "How would you proceed to make neutral oxalate of potash?"

J. B. B. WELLINGTON said, take carbonate of potash and neutralise it with oxalic acid.

A. HADDON preferred caustic potash, thus avoiding the generation of carbonic acid in the solution.

A Member stated that he had found it cheaper to make oxalate of potash than to buy it.

A question was asked whether any of the members had had any experience with hydrokinone.

The CHAIRMAN had used it; he had found it slower in action than pyro, but he certainly preferred the quality of a negative developed with hydrokinone to any other developer. A plate might be left in the developer without being fogged.

J. B. B. WELLINGTON did not consider this developer a slow one, and he had found it had a tendency to fog.

A. COWAN would attribute this variation of experience to the different qualities of the various samples on the market.

J. B. B. WELLINGTON had found it act more slowly when used in conjunction with ammonia.

A. HADDON said the development would be greatly influenced by temperature.

H. D. ATKINSON exhibited one of Marion's patent compacta envelopes for exposing plates in place of the ordinary dark slides. A plate is placed face downwards in the frame, and several folds of dark cloth from each side of the frame are alternately wrapped over the back of the plate, effectually protecting it from light.

A. HADDON exhibited a simple apparatus for determining the specific gravities of liquids. He said he was not acquainted with the methods photographers employed in order to ascertain the specific gravities of the solutions they used, whether they relied simply on photographic dealers, who again, most probably, would depend upon the manufacturing chemist. All that was required with the apparatus he exhibited was a measurement with a rule and a simple calculation. It consisted of a long glass tube bent in the centre, the ends being bent up. To each of these ends is fused a piece of tubing of much larger diameter. These larger tubes take the place of bottles or beakers in the older form. In the upper end a small piece of glass tubing is inserted, to this is attached a piece of india-rubber tubing terminating in an ordinary ball, a pinch-cock being fixed to the india-rubber tubing. The tube is fastened to a board on which a sheet of ruled paper is pasted, this board being fixed vertically on to a base-board. In order to use it, all that is necessary is to press the ball to expel the air, and then to tighten the pinch-cock. The liquid, whose specific gravity is unknown, is now poured into one of the receptacles, and distilled water poured into the



other. The pinch-cock is gradually opened, causing a partial vacuum in the tube above the surface of the liquids, which will at once rise in the tubes by atmospheric pressure. If the height of the liquid of unknown sp. gr. be made 10 inches, then the length of the column of water can be read off in 10ths of inches divided by 100, and the sp. gr. is obtained. If it is not convenient to make the length 10 inches, then divide the length of the water column by the length of the liquid column, and the result will be the sp. gr. required. Somewhat less than  $\frac{1}{2}$  an ounce of liquid is all that is required. Several determinations being made from different lengths of the columns, a mean result can be obtained, which ought not to differ from the true sp. gr. by more than 2 in 1,000. In answer to several questions, A. Haddon said the accurate determination of sp. gr. by means of the bottle, or by weighing, necessitated the use of a delicate balance which few amateur or professional photographers possessed. The hydrometer of constant weight is always available, but these cannot (unless of the best manufacture) be relied upon absolutely, and, in addition, when they are used, the vessel to contain the liquid and hydrometer must be of considerable diameter, thus necessitating the employment of a considerable quantity of the liquid to be tested. Should this be ammonia it is losing gas all the time it is exposed to the air, and is, therefore, deteriorating. The apparatus shown would be useful for determining the strength of the silver bath, the sp. gr. of a solution containing a known percentage of silver having been previously determined. Rule horizontal equidistant lines to represent sp. gr., and vertical equidistant lines to represent grains per ounce or percentage composition. Obtain a curve by joining points of corresponding specific gravity and percentage composition. This curve must be used for future reference. In order to find the number of grains of silver per ounce in a solution, determine specific gravity by means of the apparatus, find line agreeing exactly with specific gravity of solution, run along horizontal line till it cuts the curve, descend from that point by vertical line, and thus find grains of silver per ounce of solution. Ruled paper, such as is sold by Messrs. Waterlow and Son, is most convenient for this purpose. The apparatus, when finished with, is removed from the stand, washed, and hung up in an inverted position to dry.

J. B. B. WELLINGTON had tried Capt. Abney's method of coating a plate with a stained collodion to get orthochromatic effect. He had not been successful.

The CHAIRMAN said he also had been unsuccessful in his experiments in this direction.

A. HADDON passed round some pieces of chloride of silver and bromide of silver which had been fused and then rolled, constituting horn silver. One piece had been exposed to sunlight for some time without materially affecting its transparency.

#### NORTH LONDON PHOTOGRAPHIC SOCIETY.

At the ordinary meeting on May 1st, at Myddelton Hall, Islington, the President (J. T. TAYLOR) in the chair,

F. W. HART said, that as one who had worked the collodion process since Scott Archer's publication of it until the present time, he felt a great interest in the subject. The collodion positive picture possessed many advantages, among them being great delicacy of image and freedom from granularity, besides a permanency second only to the glass which supported it. In proof of this he would pass round a portrait made by himself more than thirty years ago, which had not, in that long period, altered in the slightest degree. He then proceeded to coat and sensitise a plate, which after washing was passed round, so that the members could see the character of the film before exposure. The room having been darkened, a fresh plate was prepared and exposed in the camera of one of the members, the source of light being a battery of six Hart-Bishop flash lamps discharged simultaneously. The plate was rapidly developed, fixed, and dried, and on the lights being turned up, was found to be mounted in the orthodox "mat and preserver," and ready to be passed round. Mr. Hart then explained how the portrait had been obtained. A perfectly clean glass plate had been coated with bromo-iodised collodion, it was then immersed in a solution of nitrate of silver, the result being a film of bromo-iodide of silver, bearing on its surface a small quantity of the nitrate of silver bath. After exposure the plate was treated with a solution of sulphate of iron, which reduced metallic silver from the free nitrate present, and deposited it on those parts of the plate where the haloid salts had been affected by exposure to light. The unaltered iodide was then dissolved out with cyanide or hypo, leaving the white deposit of metallic silver to represent the lights and half-tones of the picture.

The PRESIDENT said that the image, being composed of metallic silver, was very permanent so long as it was preserved from sulphurous vapours. If, however, it was treated with bichloride of mercury after the method recommended by Scott Archer, it was not only rendered much more brilliant, but actually became more permanent, as the chloride of silver and mercury, of which the whitened image was composed, was much less affected by sulphur or any other impurities in the atmosphere. Positives so whitened were known as alabastrine pictures, and were well suited for colouring with powder colours. The late Mr. Wharton Simpson found that by using a benzole varnish the colours could be made to penetrate the film, so that the picture appeared in colours on both sides of the film. Specimens of the alabastrine process were then exhibited by the President, W. H. Prestwich, and others.

W. H. PRESTWICH also exhibited collodion positives vignetted in the camera.

A. MACKIE said that although the silver salts employed in the collodion process were the same as those used in the gelatino-bromide process, the image was formed in a different manner in the gelatine process; the image was formed by the reduction of the silver salts contained in the film, while in the case of wet collodion the image was formed from the free nitrate solution, the silver in which was reduced on the portions of the film which had been acted upon by light.

E. CLIFTON gave a short sketch of the various difficulties and causes of failure in working the process, with directions for avoiding most of them.

W. BISHOP said that he quite agreed with one of Mr. Clifton's remarks, that one required to thoroughly understand the process before being able to make a good collodion positive; the plate had to be prepared, developed, and fixed by the operator himself, and gave proof of his ability if all went well. He doubted whether bleaching the positive with bichloride tended to increase its permanency.

The PRESIDENT said that the whitened image was much less likely to tarnish than the metallic silver as originally deposited by the developer. The bleaching solution was composed of bichloride of mercury dissolved in hydrochloric acid, to which was added an equal quantity of nitric acid, and a small proportion of alcohol. This solution was diluted with water to such a strength that it took several minutes to thoroughly convert the silver into chloride. The addition of nitric acid tended to increase the brightness of the shadows by dissolving any slight deposit which might be present.

J. JACKSON said that Mr. Bannister, a photographer of great repute in the collodion days, used to black varnish behind the figure only, backing up the rest of the plate with light coloured paper.

The PRESIDENT said that collodion plates could be preserved for a short time after preparation by washing and treating with iodide of potassium. They required re-dipping in the bath to replace the free nitrate necessary for the formation of the image. Good positives could be taken on plates so prepared.

Rev. E. HEALY said that positives could be taken on plates which had been simply washed and dried. Of course these also required a dip in the nitrate bath before development.

Mr. CLARK drew attention to the ease with which copies could be made, even on a considerably enlarged scale, from collodion pictures; there was no granularity or unevenness, and the only precaution necessary was to avoid reflections from the surface of the glass. He would be glad to know how ferrotype plates were prepared.

The PRESIDENT said the iron plates were made in Cornwall, and they were then sent to America to be japanned; they simply required cleaning with alcohol before coating.

Mr. CLIFTON remarked that collodion pictures could be successfully transferred to enamelled leather or American cloth, and they then possessed the advantage of being non-reversed, besides being on a flexible support.

At the next meeting on May 15, the subject for discussion will be "Detective Cameras." Members and friends are invited to bring examples for exhibition.

There will be an excursion on Saturday next, May 12, to Enfield; a train leaves Moorgate Street for Enfield at 2:16 p.m.

#### CAMERA CLUB.

The meeting on Thursday, May 3rd, was one of the best attended during the whole of the session. About seventy members and friends were present, including many known to be deeply in-



terested in the use of the platinotype process. The chair was occupied by Sir GEORGE PRESCOTT.

The subject for the evening was "The New Platinotype Cold Process," with a description and demonstration by W. WILLIS. This was the first demonstration that has been given, and the proceedings excited much interest. After a few introductory remarks, Mr. Willis proceeded to develop a large number of prints of various subjects, some from his own negatives, and some from negatives by Mr. Hollyer. The prints showed more detail than is customary with the ordinary paper. The developer was kept in two solutions, one containing the chloro-platinite of potassium (which in the ordinary process is of course already in the paper). The two solutions being mixed are of a ruddy colour, and this developer can be used for several hours. It may be diluted (and for many subjects this appears to yield great advantage) with either an equal or even twice its bulk of water.

Mr. WILLIS floated the prints in the usual manner face downwards for several seconds, and then laid the print face upwards upon a board to allow the progress in the growth of the image to be watched. The picture came with great regularity, and with about the same rapidity as if the print were allowed to remain upon the solution. At any stage the development could be stopped by plunging into the acid, or parts kept back by the application of the acid by means of a brush. After development the usual acid treatment and washing followed.

In the finished result there was very little difference as compared with the ordinary process, but variations in colour were said to be obtainable by altering certain constituents of the developer, and also the amount of half tint rendered could be varied by modifications in the solutions. The paper would probably not be found quite so sensitive to moisture as the ordinary make, but similar care had to be exercised. Its chief advantages were that the image was printed out, so as to be more visible than in the usual process; that no heating of the developer was required; that development could be modified or stopped when desired, and parts of the picture restrained; and that the images showed more detail in the shadows than with the ordinary paper.

#### SHROPSHIRE CAMERA CLUB.

THIS Club (until recently known as the Shropshire Amateur Photographic Society), which now consists of about forty members, held its first meeting of the season on the 1st inst., when there was a fair attendance of members present. Revised rules were adopted, and the election of the following honorary officers was confirmed:—

*President*—E. Cresswell Peele.

*Vice-President*—H. H. Hughes.

*Treasurer*—M. J. Harding. *Secretary*—W. M. Naunton.

*Council*—Messrs. Alltree, Bowdler, Cureton, Litt, Oswell, Pyefinch, Simpson, and Williams.

It was resolved that the opening excursion should take place on the 10th inst., to Ludlow. The following dates were fixed for monthly meetings of the Club—May 14th, June 11th, July 9th, August 13th, September 10th, October 8th, November 12th, December 10th.

#### LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting was held at the Royal Institution, Colquitt Street, the 26th ult., B. J. SAVCE in the chair.

Arthur Bradbury, William R. Clark, John Samuel, Arthur F. Stanistreet, George Wharmley, Colonel Ellison, and Mrs. Matthew Webb, were unanimously elected members of the Association.

The presentation print for 1887, a reduction of "Dawn and Sunset," was on view, and the CHAIRMAN desired to express the appreciation felt by the Association of H. P. Robinson's kindness in meeting their wishes, and so enabling them to become possessors of such a beautiful specimen of photographic art.

The CHAIRMAN adverted to the prospectus of a trading association, in which certain directors were described as "members of the Liverpool Amateur Photographic Association," and desired on behalf of the Association to repudiate any connexion of it with any trade advertisements of whatever nature.

The HON. SECRETARY called attention to the presentation print, copies of which were distributed to those members who were present. He announced that the remaining copies would be placed in charge of A. W. Beer, Church Street, from whom those members who were not present could obtain their copies,

those only being entitled to them who had paid their subscriptions for 1887.

Dr. G. A. KENTON then read his paper on "The Hydroquinone Developer" (page 298), which was accompanied by several negatives developed as described, also by a practical demonstration.

P. LANGE showed prints from negatives taken on Saturday in very dull, wet weather, which represented horses in the actual leap at the Wirral Steeplechases. The shutter was his own design, upon the Kershaw principle, but giving greater rapidity.

Mr. NOAKES exhibited some prints of the Azores, notably one showing a heavy surf rolling in to shore at Fayal, which was very fine.

#### DUKINFIELD PHOTOGRAPHIC SOCIETY.

THE members of the above Society held their first out-door excursion on Saturday, April 28th, to Marple and Romiley; leader, John T. Lees (one of the Vice-Presidents). There was a very fair muster, and the utmost interest was manifested by the members in the attempts, especially by the beginners, to capture some of the choice scenery with which the district abounds. The rustic cottages near Rose Hill, the entrance gates leading to Marple Hall, the Hall itself, and picturesque old Chadkirk, were successively photographed.

#### DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

THE seventh and last regular meeting for the session was held in Lamb's Hotel, Dundee, on the evening of Thursday, 3rd inst., at 8 o'clock, G. D. MACDOUGALD, F. Inst. Chem., President, in the chair.

The joint Secretaries and the Treasurer of the Dundee Photographic Exhibition reported its success, especially as regards the quality and quantity of the work exhibited, the large increase of the number of visitors and season ticket holders over that of the Exhibition of 1886, and that also financially it had been very satisfactory.

The sum of fifteen guineas was voted as the Society's donation to the new Victoria Art Galleries.

Three out-door excursions are to be arranged during the season, the first of these taking place on Wednesday, 23rd May.

The following members were elected office-bearers for the session 1888-'89:—

*Hon President*—Professor Caruclley.

*Acting President*—John Robertson.

*Vice-Presidents*—Dr. J. K. Tulloch and Leslie Ower.

*Council*—J. C. Cox, J. D. Cox, W. B. Dickie, G. D. Macdougald, G. G. MacLaren, J. Mathewson, F. Salmond, A. Stewart, W. D. Valentine, and J. R. Wilson.

*Secretary and Treasurer*—V. C. Baird, Broughty Ferry.

## Talk in the Studio.

DISCOVERY OF A NEW AND REMARKABLE NEBULA IN THE PLEIADES BY PHOTOGRAPHY.—(By MM. Henry).—Admiral Mouchez, in a recent communication to the Academy of Sciences, said that it would be remembered that MM. Henry had discovered by means of photography a new nebula surrounding the star Maia in the Pleiades. This nebula was too faint to be visible in the sky of Paris even in the best instruments in the Observatory; but soon after its discovery it was seen with the large equatorial of 0.76 m. aperture at the Pulkowa Observatory, and M. Struve saw it a short time after. M. Perrotin, of the Nice Observatory, also saw and sketched it as soon as the new telescope of about the same aperture had been mounted. Since its discovery MM. Henry have improved their process, and they intend to take photographs of this group of stars every year, in the hope of being able to detect any change which may take place in them, and also to see what progress they have made in the detection of double stars. The negatives obtained this year, by exposing very sensitive plates for four hours, show with great definition the delicate details of the great cosmic mass covering a large part of the constellation. The most powerful instruments in use have hitherto not been able to prove its existence. The nebulosity round Maia is only a small portion of it. The most interesting point, and



which has not hitherto been found in any other part of the sky, is a long filament of nebulous matter starting from the central mass, extending along a line running east and west for a distance of from 35' to 40', its width being only 3" or 4". This band meets on its way seven stars, which it appears to unite like the beads of a chaplet, and it changes its direction a little at the point where it meets the largest of these stars. A second line somewhat like it, but shorter, is visible in the centre of the nebulous mass. So singular an appearance would lead to the supposition that it was due to some accident in the manipulation; but as four different negatives show exactly the same details, astronomers may consider the existence of these filaments as absolutely proved. Probably these linear masses will only be visible directly in the most powerful instruments in existence, such as those at Pulkowa and Nice, and in the 36-inch telescope of the Lick Observatory. These negatives contain, moreover, nearly twice as many stars as in those first taken; more than 2,000 above the 18th magnitude have been counted. This nebula has also been photographed abroad, but the results obtained have not been as good as those taken with MM. Henry's apparatus. They only show it as large spots of white, of a uniform colour, without well defined boundaries, while with the apparatus at the Paris Observatory the most delicate details are shown with such sharpness that it will be possible to discover, by comparing with similar images obtained at different times, any variation in shape which may take place. Owing, however, to the Observatory being placed so near the centre of the town, the plates are fogged by the reflection of the light from the street lamps. The Admiral therefore urged that a branch should be established somewhere in the country where the sky would be purer.—*Photographic Journal*.

**TESTING LENSES.**—We understand that the Committee of the Royal Society who superintend the Kew Observatory are making arrangements for the testing of photographic lenses. We hope shortly to be able to publish the rules which will govern the testing, and the tests that will be made.—*Photographic Journal*.

**SHEFFIELD CAMERA CLUB.**—An association bearing this title, consisting of amateur photographers, is about to be established in Sheffield, and a well-attended meeting was held at the offices of Messrs. Arnold and Hardy, analytical chemists, Bank Street, on Wednesday evening last. Dr. Morton, Brightside, presided, and after alluding to the aid given by photography to science, art, and educational purposes, noted the extraordinary increase in the number of persons who practised photography as a healthy and agreeable recreation. He thought it was desirable that facilities for improvement and better accommodation should be afforded to the large band of amateur photographers residing in Sheffield and neighbourhood. He had pleasure in proposing "That this meeting approves of the formation of an association entitled, 'The Sheffield Camera Club,' consisting of ordinary and honorary members, being exclusively amateurs, and that the object of this club is for the study and advancement of photography, and the mutual improvement, benefit, and recreation of its members." This was seconded by W. Winder, and carried unanimously. The following gentlemen were appointed a committee to make arrangements necessary to establish the club:—Mr. G. T. W. Newsholme, M.P.S., Mr. J. O. Arnold, F.C.S., Dr. Morton, Mr. Winder, F.C.S., Mr. G. E. Maleham, Mr. Rawson, Mr. Hardy, F.C.S., Mr. Gilley, and Mr. E. Howarth, F.R.A.S.—*Sheffield Evening Telegraph*.

**ALBUMEN FOR INDUSTRIAL PURPOSES.**—The *Scientific News* refers to the method of Waters, by which albumen is extracted from the eggs of fishes. By means of a preliminary washing he removes blood and other impurities from the ovaries of the fish. They are then burst, and the eggs are laid to steep for twenty-four hours in three times their weight of water containing about 5 per cent. of soda or potash.

**BURGLARY AT THE WOODBURY COMPANY.**—During the early hours of Tuesday morning a burglary was committed at the office of the Woodbury Company, 157, Great Portland Street, London, an entrance being effected by forcing the street door with a "jemmy." It is supposed that the thieves were disturbed before they could make any attempt upon the safes or desks, as the only property carried off was a frame containing fac-similes of the various gold, silver, and bronze medals awarded to the Company, and also the medal obtained at the International Inventive Exhibition.

**THE IRISH EXHIBITION IN LONDON.**—This Exhibition will be opened on the 4th of June, and remain open until the end of October, and the whole of the vast space at Olympia will be

utilized. Among the special features will be a representation of an Irish Village, with the veritable peasants at work upon their cottage industries—the dying of yarn, making lace, knitting, &c.

**THE HUMOUR OF IT.**—The amateur was in England this time. He had focussed upon a picturesque cottage, when a cur ran out, barking at him. In his fright he seized his tripod and ran one of the pointed legs thereof through the body of the dog. The yelps of the wounded brute brought out the owner of the cottage, who, seeing what had happened, cried out, "Oh, dearie me! Why didn't you come at 'im with the hother hend?" Amateur: "Why in thunder didn't 'e come hat me with 'is hother hend?" Now, upon that house is inscribed "Warning! Photographers and other tramps are strongly forbidden to photograph this cottage."—*Philadelphia Photographer*.

**LIGHT WAVES AS A STANDARD.**—"Scientists are watching with great interest," says a dispatch from Cleveland, Ohio, "the joint experiments of Professors Michelson, of the Case School of Applied Science, and Morley, of Adelbert College, in an effort to determine the feasibility of making the wave lengths of light the ultimate standard of accurate measurement. Previous to their measurements, the limit at which interference of light had been secured was 50,000 wave lengths. On Friday they secured such interference at 250,000, and think the ultimate limit not yet reached."—*Philadelphia Photographer*.

**PAPERS IN TYPE, BUT STANDING OVER.**—Among these may be mentioned "A Lens Tube," by Addenbrooke, and "Chrome Alum," by J. Spiller.

**PHOTOGRAPHIC CLUB.**—The discussion on May 16 will be "Developing and Changing Plates *en voyage*." Saturday afternoon outing at Enfield. Bank holiday outing, May 21st, at Oxted; trains from Victoria at 10.40, London Bridge at 10.41.

## To Correspondents.

\*. Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

**LENS.**—We cannot form the least notion of the value of the lens without seeing it; but most of the secondhand lenses sold in the pawnshops as "Shepherd's Improved" are spurious, and completely valueless. If it is a genuine Shepherd's lens, it may be worth 25/- or 30/- as a secondhand article.

**G. W. C.**—If the price is what you state, it is absurdly high.

**BAD IRON.**—Add a few drops of sulphuric acid.

**X. Y. Z.**—The lens may perhaps be reasonable value for the money, but if you want the best, you must go to one of the high class opticians.

**BOX.**—Write to Marion and Co.

**J. HAYMAN HOSKINS.**—The address is Linden House, Hadley, Barnet.

**C. J. SMITH.**—If you write to the firm you mention, they will forward you a price list.

**A. and J.**—Longman, Johnson's Court, Fleet Street.

**J. R. CARR.**—1. A suitable bright red paper can be obtained at a low price from Spaulding and Hodge, Wholesale Stationers, Drury Lane. 2. Dr. Vogel's researches on the subject can be found in our volume for 1883. 3. M. re acetic acid must be used, and there is no mischief to be feared from such an excess as ten or fifteen drops to the ounce.

\*. Several answers stand over.

## The Photographic News.

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## PHOTOGRAPHY WITHOUT A LENS.

In the older works on Natural Philosophy, intended for popular use, a favourite way of introducing the subject of the formation of an image as we see it in the camera, was an illustration of the image formed on a white screen in a darkened chamber, when a small hole was bored in the shutter. This method of attacking the subject has its merits, one of which is the easy way by which the inversion of the image is explained and accounted for to those who have not previously given any consideration to the study of optical phenomena. When, owing to the discovery of photography, the camera as an instrument obtained an importance altogether exceeding that which it had previously enjoyed, it was recognised that whilst it might be theoretically possible to obtain a transcript from nature by means of a small aperture alone, yet that the exposure required with the processes then in vogue would be so great that practically the image given by a lens—or as a passing curiosity by a concave mirror—was the only one that had seriously to be taken into account.

With the advent of more sensitive materials with which to perpetuate the camera image, some further interest was shown in the shape of occasional articles upon and examples of photographs taken by a camera with a small opening instead of a lens—pinhole photographs, they were commonly called—but it was not until the gelatine bromide process, with its exalted sensitiveness, came upon the scene, that any serious consideration was given to the subject. In this country some results of small size, obtained by A. L. Henderson, attracted some attention a few years since. A picture which probably received more notice than any other, that had been previously taken without a lens, and which certainly was of more than passing interest, was one taken by Capt. Colson, and reproduced by a block printing method in the columns of our French contemporary, *La Nature*.

The same Capt. Colson has since devoted considerable study to the subject of photography without a lens, and has succeeded in exciting fresh interest in the question. In one particular the result of his labours will be a disappointment to those who have supposed that increased sharpness could always be obtained by means of still further diminishing the size of the opening that takes the place of the lens. Those who have reasoned thus, have naturally enough concluded that it would be merely a question of obtaining a film of sufficiently exalted sensitiveness, to enable them to dispense with a lens for the general purposes for which it is now employed. Capt. Colson, however, in a communication entitled "Law of the maximum of sharpness of the image in photography without a lens," presented to the French Photographic Society, lays it down that there is, with each distance of aperture from plate, a certain size of opening with which

the maximum sharpness obtainable without a lens is produced, and beyond which, with an opening either smaller or larger, sharpness falls off. The distance from aperture to plate, he refers to conveniently as focal length, from analogy to what takes place when the image formed by a lens is in question. With this preliminary understanding for the word focus in connection with the image found by a small opening, he gives a table of diameters which should be employed to obtain the sharpest images with foci of varying length.

The law which Capt. Colson propounds is that the square of the diameter of the opening (not the diameter itself, in which case the proportion would be a simple arithmetical one) bears a relation to the focal length of about 0.00081 to 1, or expressed in a mathematical formula  $\frac{d^2}{F} = 0.00081$ ; this number being an average derived

from several experiments, when  $d$  represents the diameter of the aperture, and  $F$  the distance of the aperture from the plate; which distance by convention is called the focal length or focus. According to this formula, a focal distance of 4 inches will give the sharpest image with an aperture of about  $\frac{1}{100}$  of an inch, whilst for an image of the size which would be given by a lens of 50 inches focus, an opening just over the  $\frac{1}{2}$  of an inch will be that which yields the greatest definition.

The results of Captain Colson's investigations—which have been carried out by means of actual experiments made with apertures of various sizes for each so-called focal length—lead to some very curious deductions. The first is that to which we have already referred, namely, that there is a limit to the sharpness obtainable by means of pinhole photography, and that for large images the limit is attained with an aperture so large that the expression pinhole is no longer a descriptive one.

The second point is, that the exposure for large pictures will be longer than that for small ones in a proportion that can be calculated from the figures given. Thus, in the cases taken of a picture taken at a distance of 4 inches from the aperture of least size, and of one taken at a distance of 50 inches, the exposures work out as 16 and 156 respectively, or nearly 10 to 1. We may say, as some guide to those who may wish to experiment in this direction, that with a brightly lighted subject, and with a highly sensitive plate, the figures just given, taken as representing seconds, will probably yield a picture the exposure of which will, at all events, be sufficiently near the mark to indicate what the correct exposure should be.

The third consideration is, that for small pictures to be subsequently enlarged, the definition can never be so satisfactory, as when the picture is taken on a large scale at once. Indeed, it occurs to us that the only case in which the use of a small aperture can come seriously into compe-



tion with a lens for the production of photographs, is when a large direct photograph is in question. The lack of minute definition is here not such a drawback as in other cases, whilst the "depth of focus," the want of which is the weak point in large images produced by lenses of long focus, is unlimited.

The subject of photography without a lens has received much more attention latterly from the French photographic world than from our own. In the catalogue of one Parisian photographic dealer, at least, an apparatus is illustrated consisting of a revolving diaphragm plate, pierced with minute apertures of various sizes, to be used as occasion requires. There is certainly a kind of charm in the ability to take with one apparatus a photograph of whatever proportion may be desired upon the plate, and perhaps the publication by Captain Colson of the conclusions derived from his labours, will induce photographers in countries other than his own to devote some attention to the subject.

### LAW FOR PHOTOGRAPHERS.

BY S. J. DEBENHAM, SOLICITOR.\*

In this modern England of ours, in the fore front of civilisation, it is our natural pride that we are a law-abiding people; and we are, it is to be hoped, no less prudent than proud. The free-fighting, red-shirted squatter or bushman, or denizen of the prairie, ranch, gulch, or whatever uncouth name his location may assume, may glory in his independence and rowdy devil-may-careishness, but the citizen of a state like ours best consults his own peace and comfort and that of his neighbours, to say nothing of his pecuniary interest, by observing the laws which govern it; and he cannot do this without knowing something of them. At any rate, it behoves him to make himself acquainted with the laws that govern or affect his particular calling, and with which he may, he knows not how soon, come into contact.

The anxiety of competition in business, now that so many in such close ranks are pushing to the front; the care necessitated by a desire to excel in our calling, render it extremely desirable that the mind should be kept free from the trouble which may ensue from unwittingly running into a pitfall or snare in the shape of a lawsuit, which, by a little knowledge and precaution, we might avoid.

Every one is supposed to know the law. This is one of the cardinal legal maxims: *Ignorantia non excusat*. This is a grim joke, seeing that a point of law may go from a single learned judge to two, and so on up to the House of Lords, and judges may differ among themselves at every step, and finally the ultimate Court may be divided in opinion.

However, there is no doubt that a man in business ought to know something of the law, and I therefore propose to devote a few columns to the enlightenment of the readers of the PHOTOGRAPHIC NEWS on some of the points of law likely to arise in the conduct of their business.

#### I.—PREMISES.

One of the first things a young man does who is about to start in business is to take a house with or without a shop; in short, he either buys premises or rents them.

##### Chapter I.—Purchase.

House property is of three kinds: freehold, leasehold, and copyhold. We may leave the last out of our disquisition, as it is rarely met with, and most rarely in towns.

Freehold property is called real estate; leasehold, personal.

If a man wishes to be independent of a landlord, and to leave his property at his death not subject to probate duty, he will choose the former, supposing he has his choice, and that the premises be in other respects equally eligible.

It is one of the anomalies of our fiscal system that land (which includes freehold houses) is exempt from probate duty. It is, however, subject to succession duty.

Probate duty is the duty paid to the Government on making the grant of title to the representatives of a deceased person. The exemption of real estate from probate duty is probably due to the superstitious reverence still existing in many minds for landed property. Whether this will continue is a matter of speculation into which it is not necessary to enter for the purposes of this treatise.

Succession duty is payable alike on real and personal property by the heir or legatee. It varies in amount according to the degree of relationship to the deceased, and if there be no relationship at all, the duty is 10 per cent.

The duty on purchase (*i.e.*, the stamp payable to the State by the purchaser on his title deed) is the same in either case. The expense of conveyance is also the same, except that in leasehold sometimes extra fees have to be paid to ground landlords or their solicitors.

The usual price for purchase of freehold property is about 20 times the net annual value. For leaseholds 11 or 12 times, if a long lease. The shorter the term (if less than 35 years) the lower the price. Much, however, of course, depends on the situation of the property, and other peculiarities.

The cost of the conveyance of property is borne by the purchaser, unless otherwise provided. Solicitors' charges on the purchase and mortgage of real and leasehold property are now fixed by a scale, instead of being, as was formerly the case, somewhat elastic. This scale is, on the whole (particularly in large purchases, which do not, however, much concern us), more favourable to the profession than the former plan, and I, for my part, habitually make a reduction from it.

These matters, however, form but a small percentage of the total amount disbursed for the purchase of property. The critical matter is, of course, the price paid to the vendor, and it is but a truism to say that this is a matter of bargaining, requiring individual acumen, astuteness, and skill in negotiation.

If the reader proposes purchasing, but has not the necessary capital, it is generally possible to defer payment of the greater portion by mortgaging the property to the vendor (leaving part of the purchase money on mortgage); but if this cannot be done, money may be borrowed for the purpose of a building society, they becoming mortgagees. In doing this, however, care should be taken in the selection of the society. The rates of interest payable to these societies vary from 5 or 6 per cent. to 10 or 11. It should be stated (and here, once for all, I may apologise for adapting my remarks to the most unlearned) that the repayment generally is made by instalments of principal and interest, the amounts varying, of course, with the time of duration of the loan; and that it is not necessary for the purchaser to have been a subscriber or shareholder.

Probably three-fourths—and a larger proportion in London—of the houses that would be chosen (most of them having shops attached) by photographers will be leasehold; and therefore, I propose to go further into the incidents and conditions attaching to this class of property.

The value and security of leasehold property has been materially increased by the Conveyancing Act, 1881. Before this Act came into operation there were many drawbacks and dangers connected with it which have been removed.

It is probable that in most cases the lease will not be granted to the purchaser direct by the landlord, but will be purchased with the goodwill, if a business be purchased. In this case it will be an assignment of the lease.

I will premise by saying that it is advisable to avoid purchasing a lease which has but few years to run, unless, indeed, there is well-founded expectation of renewal on

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liberal terms. The lease may not be renewed at all. If it is, terms as to repairs will probably be imposed by the landlord, and perhaps a premium exacted. This has been done in many cases at the West End of London, on the estates of the Duke of Westminster, the Marquis of Salisbury, the Duke of Bedford, and others, with a result equally unlooked-for and disastrous.

Even if this does not occur, the lessee or assignee at the termination of a lease is usually liable to heavy payments for dilapidations and repairs, which he little thought of encountering when he took to the premises. This is a most iniquitous system, that the occupier of premises let at what is a fair rental, and on which a man has, perhaps, laid out large sums for fittings, &c., should, when he has occupied them for years, and the landlord has enjoyed the rent without laying out a shilling for his tenant's benefit, at the end of the term not only lose the place altogether, but be subject to grievous fines in respect of what he involuntarily renounces.

A lease may, however, be forfeited during the continuance of the term of years for which it is granted. Before the operation of the Conveyancing Act, 1881, it might be forfeited for non-payment of rent in the proper time, or for neglect to keep up the insurance, though the Court had power to give relief against such forfeiture on the term laid down by the several Acts of Parliament, which included in all cases payment of the legal costs of its intervention.

There was no power to reinstate the tenant in any other cases of forfeiture, unless under very special circumstances, as where by unavoidable accident, by surprise or ignorance not wilful, parties had been prevented from executing a covenant literally.

As regards non-payment of rent, the matter still remains where it was; but as regards insurance, the Act is more favourable to tenants; and practically there is little or nothing to complain of under this head.

The tenant, however, must rigidly observe the following covenant if contained in this lease, as the Act gives no relief in respect of it.

A covenant or condition against the assigning, underletting, parting with the possession, or disposing of the property.\*

Cases of forfeiture formerly occurred also where there was an obligation to keep the properties in repair, or to do certain repairs at specified times; or where a trade (even the keeping of a school) was carried on contrary to stipulation; and there was no remedy. The Act provides by section 14 that 1. "A right of re-entry or forfeiture under any proviso or stipulation in a lease, for a breach of any covenant or condition in a lease, shall not be enforceable by action or otherwise, unless and until the lessor serves on the lessee a notice specifying the particular breach complained of, and if the breach is capable of remedy, requiring the lessee to remedy the breach, and, in any case, requiring the lessee to make compensation in money for the breach, and the lessee fails, within a reasonable time thereafter to remedy the breach, and to make reasonable compensation in money to the satisfaction of the lessor, for the breach."

2. "Where a lessor is proceeding, by action or otherwise, to enforce such a right of re-entry or forfeiture, the lessee may, in the lessor's action, if any, or in any action brought by himself, apply to the Court for relief; and the Court may grant or refuse relief, as the Court, having regard to the proceedings and conduct of the parties under the foregoing provision of this action, and to all the other circumstances, think fit; and in case of relief may grant it on such terms, if any, as to costs, expenses, damages, compensation, penalty, or otherwise, including the granting of an injunction to restrain any like breach for the future, as the Court, in the circumstances of each case, thinks fit."

Of course the landlord may by accepting rent after

knowledge of an act of forfeiture waive it; but he may *per contra* do this: suffer the act of forfeiture to go on, or the conditions of forfeiture to be perpetuated by one tenant, and when that tenant assigns to another, forbid his continuing it. The following has occurred in my own practice: A gentleman carried on a high-class boarding-school, and sold it through a scholastic agent to a purchaser. The transaction being completed, the purchaser received a letter requiring him to discontinue the school. He came to me, and I advised him he could not resist the demand. He was not inclined to give way, and the freeholder, a building society, brought an action to dispossess him. I saw there was no defence, and so advised. But he was so unwilling to give up his position, that I was compelled to fight the action out, with the result of a verdict against him, and of course accompanied by costs. There is nothing like an illustration for enforcing a lesson, and my readers will do well not to be persuaded into signing any contract or agreement for purchasing without first looking well to the covenants in the lease.

It may be that you take a house under an agreement merely, in which case the landlord generally has the burden of repairs, &c. In this case you are simply an ordinary tenant, and must be careful to observe the usual conditions of that position as limited by your agreement.

## THEORETICAL CHEMISTRY IN ITS PRACTICAL BEARINGS ON PHOTOGRAPHY.

BY RALPH W. ROBINSON.\*

### VIII.—PRINTING PROCESSES—ARGENTIC BROMIDE—CARBON—CYANOTYPE—PLATINOTYPE.

A FEW more printing processes, besides the ordinary silver process, are of sufficient importance and general interest to claim our study here of their chemical theory. They are the "Argentic Bromide," "Carbon," "Cyanotype," and "Platinotype" processes.

Of these, the theory of argentic bromide printing is identical with that of gelatine plates, while the whole of the chemistry of the carbon process is involved in the action which takes place when gelatine is exposed to light in the presence of potassium bichromate. The practical result is that the gelatine is rendered insoluble and incapable of absorbing or being dissolved in water; but our chemical knowledge of the action that takes place is somewhat vague, and we are not able to say more than that the potassium bichromate is deoxidised, while the gelatine undergoes oxidation—not a very full and clear explanation of one of the most useful to photography of re-actions brought about by light, and a change which has been utilised in a number of the most important processes yet invented, including the carbon, Woodburytype, Stanotype, and numerous photo-mechanical processes. However, we must be content with what is known until more light is thrown on that exceeding complex substance, gelatine, to which photographers owe so much, and of whose chemical constitution so little is understood.

There then remain for our consideration the cyanotype, or "blue" process, and the Platinotype process. Both these depend on the reducing action of light on iron salts, whereby the more highly oxidised ferric salts are reduced to ferrous compounds.

In the "blue" process paper is coated with a solution of a ferric salt to which is added potassium ferricyanide. No precipitate is formed when these two salts are mixed together in solution, but when ferrous is substituted for ferric salt an intensely blue precipitate is formed, known as "Turnbull's blue," or more scientifically, triferrous diferric dodecacyanide, of which the composition is represented thus:  $\text{Fe}_2\text{Fe}_{12}(\text{Cy})_{12}$ .

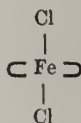
It will thus be understood that when the reduction of iron salt by light takes place in printing this paper, a blue

\* This covenant is, however, generally inserted with the qualification "without the consent in writing of the lessor."

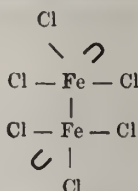


image is formed by the double decomposition of this ferrous salt and the potassium ferricyanide.

The chemistry of the above and the following process will be more clearly understood if a proper comprehension be grasped of the relation between ferrous and ferric salts. We will take the chlorides as types of the remaining iron salts. Ferrous chloride is represented by the formula  $\text{Fe Cl}_2$ , whereby the iron is shown to act as a dyad, but it is known to be also capable of acting as a hexad. There are, therefore, only two out of six bonds of the iron satisfied, and four remain latent, being united with one another in pairs. A graphic formula will make this more clear.



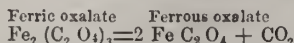
The formula of ferric chloride is  $\text{Fe}_2 \text{Cl}_6$ , in which the iron has only two bonds of each atom latent, and, therefore, acts as a triad, or as a pseudo-triad, one bond of each atom of iron being occupied in holding together the two iron atoms. The graphic formula is therefore—



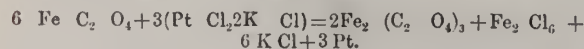
This explains how the formula  $\text{Fe}_2 \text{Cl}_6$  is more correct than  $\text{Fe Cl}_3$  for ferric chloride, although both represent the same proportional composition.

*Platinotype.*—This beautiful process depends on very simple chemical facts. They are these: light reduces ferric oxalate to ferrous oxalate, and the latter in solution reduces platinum salts to the metallic state. There are several ways of utilising these reactions.

At present the most usual way is to coat paper with a mixture of ferric oxalate and potassium chloro-platinite, the double chloride of potassium and platinum ( $2 \text{ KCl}$ ,  $\text{Pt Cl}_2$ ), and after exposure to float the paper on a bath of potassium oxalate solution heated to about  $180^\circ \text{ F}$ . As stated above, the exposure to light causes reduction of ferric oxalate to ferrous oxalate, and carbon dioxide ("carbonic acid"  $\text{Co}_2$ ) is set free according to the equation—



When the paper is floated on the oxalate bath every particle of ferrous oxalate immediately on coming in contact with potassium oxalate is dissolved, and has its deoxidising power set in action, reducing its proportional quantity of platinum salt to the metallic state.



The above are the principal and essential reactions of the process, but it is also probable that some minor changes take place. For instance, it seems that some slight effect is produced by light on the platinum salt, and that also, as observed by Pizzighelli, some gas, probably carbon dioxide, is evolved when the developer acts on the print.

Recently an important modification of the process has been patented by Willis. He coats the paper with ferric oxalate, and develops in a cold solution of potassium oxalate and potassium chloro-platinite, there being either with the ferric-oxalate in the paper, or in the developer, or in both a very small proportion of mercury or lead salt, preferably mercuric chloride or lead-nitrate. Now without the mercury

or lead salt it was found that potassium oxalate dissolved the ferrous oxalate off the paper before the platinum salt had sufficient time to act on it, and so part of the reduction took place in the developer instead of on the paper, and a very unsatisfactory image was produced. To avoid this Willis first proposed to add a phosphate to the developer to render the ferrous oxalate less soluble, but the process was not satisfactory in regard to purity of colour of the image, and the addition of a mercury or lead salt was resorted to, which so increases the energy of the reducing action as to nullify the injurious dissolving tendency of the potassium oxalate, development being completed even in the cold before solution takes place. The reason why the lead and mercury salts act in this way, I believe, has not been accurately ascertained, but it has been suggested, with good reason, that the action is "catalytic." This is an interesting form of chemical action which we have not previously had occasion to describe.

"Catalysis" occurs when a body, though undergoing no change in its own composition, yet so acts by its presence on other bodies that actions which would not take place at all, or only with difficulty, in its absence, take place readily in its presence. An interesting example of this action is that on which Deacon's Bleaching Powder Process is based. When hydrochloric acid (gas), steam, and air are passed over heated cuprous chloride, they are decomposed into chlorine and water, but this change does not take place when they are heated to the same temperature without the intervention of cuprous chloride. Yet there is no permanent change in the cuprous chloride, as the action can be carried on indefinitely without the use of fresh copper salt. The cuprous chloride tends to draw the chlorine of the hydrochloric acid into combination with itself, while the oxygen tends in the same way to attract the hydrogen; but directly the cupric chloride is formed it is decomposed by the temperature at which the operation is conducted, and thus fresh cuprous chloride is again formed. So in an analogous way the mercury salt may act in the new platinotype process. Ferrous oxalate easily reduces mercuric chloride to mercurous chloride, which, in its turn, reduces the platinum salt, and so is again converted into mercuric chloride, when it is again reduced by more ferrous oxalate. It will thus be understood how a very small proportion of mercury salt, by working in this way, has such an important effect on the reducing energy brought to bear on the platinum salt.

My task is now completed. If I have shown my readers that the study of chemistry adds a new charm, and is the only means of working intelligently in the ever-increasing array of photographic processes, my aim is accomplished. Beautiful pictures, I admit, may be produced without any knowledge of the parent-science, as is chemistry of photography, but unless a more methodical and scientific system of thought arises amongst the general body of photographers, we must be content to advance by slow degrees, rather than by leaps and bounds, as might be the case where a struggle is made to take the first step in that "dry" subject, Chemical Theory. The outside aspect of dryness is as a veil, which lifted, reveals such thoughts as judiciously applied to practical experiment yield intellectual pleasure surpassing expectation, and may guide the worker at any time to important discoveries. Let the photographer, then, whose mind is of an experimental rather than artistic tendency, base his work on a sound scientific basis, and of all branches of science to him, to commence with, chemistry is the most important.

In commencing the study of chemistry, should it be impracticable to attend a good course of lectures, the student should procure a standard text-book, such as "Roscoe's Elementary Chemistry" (Macmillan), and work through it, carrying out the experiments in conjunction with his study of the theory, for in a practical science theory, without experiment, can convey at the best but vague impressions to the mind,



## THE VIGNETTE.

BY C. BRANGWIN BARNES.

WITH the more cultivated classes of the British public the vignette holds the premier place among the various styles of photograph, especially for the smaller sizes, such as cartes or cabinets. The preference is, I think, a perfectly just one, as nothing is more pleasing to an artistic eye than a nicely printed and carefully graduated vignette. I remember, a year or so back, hearing an opinion expressed—and that by a well known and popular West End photographer—that there was not a really good vignette-printer to be found in the United Kingdom. While admitting that many vignettes turned out by even the leading firms, so far as price is concerned, are far from perfect, I am still of opinion that there are at any rate a few first-class printers in England who can turn out well-printed evenly and artistically graduated vignettes, that will compare favourably with any produced on the Continent or in America. I would go farther than this, and state my belief that almost any printer, with any artistic skill—and I presume most printers have at least a modicum of this—can produce good and perfect vignettes if his heart be in his work. It is one thing to put a piece of brown paper or cardboard with an oval or pear-shaped aperture over the negative, and trust to chance for the rest, and quite a different one to proceed in the proper manner. Any printer—even an apprentice, or an errand boy with a few weeks' practice—can print a vignette, or what he would term such, but that is no reason why his employer should inflict his productions upon the public as artistic work.

There are many ways of producing vignettes, and most of them are good, or rather can be made to yield good results in certain hands; but the main aim of the present paper is to discover a mode or method of vignetting which shall prove efficient in any hands, provided only that a little care be given to the work. The photographic printer has for years been undervalued, or perhaps I should rather say that the art of photographic printing has been undervalued, and, what is more, underpaid. A thoroughly good printer is worth quite as much as a good operator, and though I run the risk of raising a deprecatory howl from some of the latter, I consider that it requires quite as much brains and quite as much artistic knowledge and capability to become the one as it does the other.

It does not require much skill or art culture to place a piece of albumenized paper on a negative and place it in the light until it is printed, to wash the resulting print in one or two changes of water in company with a hundred or so other prints obtained in the same manner, to pass them through a bath containing a stated amount of chloride of gold and acetate of soda, until they are all of a particular shade of brown, or purple, or grey, then to immerse them for a specified time in a bath of hyposulphite of soda, and finally to wash them all night in running water. Neither does it require much of either to stand or sit a person in the studio, focus them sharp, and expose a plate, and afterwards develop it in a solution made up from a formula. But as he who pursues the latter course is not necessarily a good operator, neither is he who pursues the former a good printer.

As the operator has to exercise skill and judgment in his lighting, his posing, exposure, and development, so has the printer to use the same skill and judgment in his printing and toning, and more especially in his vignetting. Many a negative—in point of fact, most negatives—can be made to yield a better result in the hands of an artistic printer than in those of a merely mechanical one; but the title of this paper being "The Vignette," I must only for the present deal with that especial style of print, and describe the method of producing it.

The old and stereotyped mode of masking with cardboard or brown paper can be made to produce very good results with a considerable amount of attention, and the

vignetting glasses and papers sold for the purpose are very good in their way; but for easy working and uniformly good results the method I am about to describe, I think, if a fair trial be given it, will be acknowledged to take the palm. The negative to be vignettied should be placed in a pressure frame of the correct size, so as not to allow too much play, as a slight movement up or down, or to one side, between the prints will spoil uniformity in the order. The sides of the frame should not be too thin, so as to bring the vignetting mask too close to the negative. Tissue paper should be stretched over the front of the frame with starch. When dry it will be as tight as the proverbial drum. Now hold the frame up to the light and draw a line on the tissue paper, close to the top of the head and round the shoulders for a bust picture, or lower if for a three-quarter, with a brush charged with Brunswick black, then block the whole of the other portion of the paper with the same, and allow it to dry, which it will do in a few minutes; then place the sensitized paper upon the negative and print in a good light, preferably in the sun, which should be allowed to shine straight upon the frame. If the first print is not exactly what is required, the mask can easily be altered with the Brunswick black, and when one print is obtained that is perfect, the remainder are sure to be exactly the same. A fresh mask should be made for each negative printed, it being better policy to use a little more of the very cheap materials than to adapt a mask already made, which will occupy almost as much time, and rarely if ever give as good results as a new one. The process of making vignettes for the day's orders should be the first work of the morning, and as practice makes perfect, it will be found that quite as many vignette masks can be made in a quarter of an hour by this method as by the old one of cutting apertures in cardboard and serrating the edges; and I am certain the results will be far more satisfactory to all parties concerned.

The one objection to the vignettied photograph is that the crude white background kills the white of the picture, and to avoid this, the crayon or mezzotint vignette was introduced a year or two back. From some cause this style does not seem to have been universally or even generally adopted, although wherever specimens are shown, it is found that the public nearly always give it the preference.

The best way of producing this style of picture is to place the ordinary vignette, fresh from the printing frame, on a slab of wood or sheet of glass, and place another piece of glass over it, on which paint out the face, hair, and upper portion of the figure with the yellow vignetting paint, then expose for a few seconds to bright sunlight, moving the upper glass with a circular motion during the exposure; this will be found to yield a better result than blocking with wool, and printing in the shade, which often leaves marks, while this method cannot possibly do so if the upper glass be kept in motion. Some photographers do not like the plain grey background that is given by this means, and print in a pattern instead; this pattern is produced by taking a negative of a piece of Morocco leather, or marble, and placing the print under this negative, blocking the face and other portions in the same manner as above. Personally I must give the preference to the plain even grey, considering that the introduction of a pattern gives an air of vulgarity to the finished picture. If the portrait proper be so small that the background appear to unduly preponderate, instead of the Morocco or marble pattern, I would advocate the introduction of a second border, by printing again with an oval disc over the centre, and only just a couple of shades darker than the ground tint. Pictures thus treated are still vignettes, and to my mind look more artistic than the plain ones; besides which they will stand longer, or will appear to do so from the fact of the background being darker. The system adopted by one or two firms of printing in the background almost black I cannot recom-



mend, although it is possible that some customers might be found to like the results.

It is true that the vignette requires more care, and causes more waste in its production, than the plain print, but when it is borne in mind that much higher prices are obtained for vignetted portraits than for plain ones, it is surely worth all the extra trouble to produce good results, and to turn out none others. Better, far better, throw out a dozen prints or so, and keep the sitter waiting an extra day, than send home pictures as vignettes which savor more of the medallion. The main requisite for the reproduction of perfect vignettes is "care," and without care they can never be obtained.

## Review.

OUR LANES AND MEADOWPATHS, OR RAMBLES IN RURAL MIDDLESEX. By H. J. Foley. Demy octavo, 114 pages. Price one shilling. (London: Hutchings and Crowsley, Henry Street, St. John's Wood, and 123, Fulham Road, S. W.)

A PLEASANTLY written guide to Rural Middlesex is always welcome to the Londoner, especially if he is one who uses tricycle and camera.

The author commences with Hampstead Heath, and after having described and illustrated the attractive points, takes his readers to Hendon and Mill Hill, then along the pleasant Brent Valley and to other localities; finishing the round with the Weald District. There is also an Appendix with tabular matter, and information of special interest to the cyclist.

JOURNAL OF THE CAMERA CLUB. Vol. I, 1886-1887. (London: The Camera Club, 21, Bedford Street, Strand, London, W.C.)

WE have here a handsome volume consisting of a hundred and sixty pages, and containing a large amount of valuable matter; altogether it reflects much credit on the managing organisation of the Club.

## A LENS TUBE WITH IRIS DIAPHRAGM AND ADJUSTABLE EXPOSER, AND A COMBINATION SET OF LENSES FOR USE IN SUCH A TUBE.

BY G. L. ADDENBROOKE.\*

ONE of the first aspirations most men have, after mastering the rudiments of photography, is to be able to command the range of subjects which the possession of more than one lens gives. The more photography is thought of in its artistic aspects, the more is this want felt.

Few things are more tantalizing than to see the beauty and charm of a landscape or architectural subject, and then to find either that the lens you have will not take it in, or that, taking it in, so much else is included in the picture that what you wished for is dwarfed and lost.

In my own case this desire for greater range, curtailed on the other hand by questions of portability, has usually led me to take about three lenses, giving on the plates I use, one a fairly wide angle, another a moderate angle, and a third of still longer focus for portraits, groups, and the larger proportion of rapid work. Such a set of lenses, with an exception every now and again, fairly covers the range of subjects usually attempted.

But even such a modest set of lenses as this is, means carrying about three lenses mounted in brass tubes, three caps, three cases of stops, each containing six or seven separate pieces of metal, usually three camera fronts fitted with flanges, in all about thirty-two separate parts. Further, if one wants to do rapid work, one or more shutters must be added, with adjustable flanges to suit the different lenses.

Besides the nuisance of having so many separate parts, a great deal of time is taken up in fitting and refitting lenses and fronts in the camera, in keeping the stops sorted and in their proper order, in preventing caps finding their way into unsuspected pockets, and in fulfilling other little requirements.

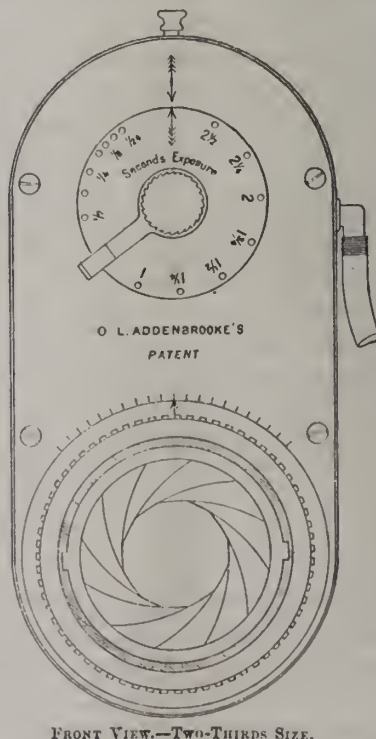
In attempting to improve this part of the photographer's outfit, one of the first things to do is to get rid of the three fronts, and to make all the lenses fit into one flange. This saves much time in changing fronts, and gets rid of somewhat bulky and heavy extra pieces of apparatus.

Next we come to the lenses. Why have separate tubes? Why not mount all the lenses in cells which will fit in one tube? I think I hear someone say: Oh, combination lenses! and look grave, or at any rate dubious. But this is a secondary consideration, though an important one, on which I propose to say something later. The facilities gained by the use of the apparatus I have here do not depend at all on the question of combination lenses; though if successful combinations can be effected, the utility of the apparatus is increased. To gain a great advantage, it is simply necessary to mount the lenses of ordinary objectives in view cells of the right depth. Each double combination set of lenses will then be exactly the same, and just as perfect as if mounted in its own separate tube, which is, however, by this means, got rid of.

Many years ago, Darlot introduced a combination set of lenses. One hears of them occasionally; but whether the lenses were not up to our English standard, whether he was before his time, or whether prejudice has been too strong for them, I cannot say; at any rate, they never came into very general use.

To get the finest results, the two sets of lenses in a combination must be carefully made to suit each other, and there is, I think, a general impression that in combination lenses something must be sacrificed all round. This, however, need not be so. Suppose we take three pairs of lenses, A, B, and C. The two A lenses may be a rectilinear pair, and together form a perfect lens in every way, likewise the B pair and the C pair. It is, of course, also obvious that each lens can be used separately.

Further, should we for any purpose require a lens of focal length intermediate between A and C, we can combine together one of the A lenses and one of the B lenses, or one of the B lenses with one of the C lenses. Taking the A lenses as the shortest focus, and the C as the longest, both these additional combinations will be found to make very good objectives, giving

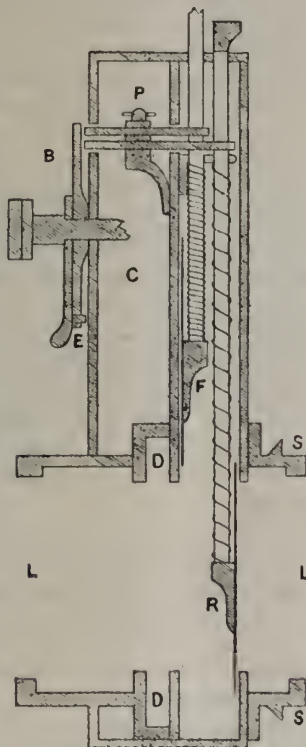


straight lines—not working with quite such large apertures, or giving quite such flat fields perhaps as the two A, B, or C lenses together, but nearly so, and at any rate giving perfectly satisfactory definition with slightly smaller equivalent stops than would be required for a perfectly symmetrical combination of similar focal length. The combination of A and C is naturally not quite so

\* A Communication to the Photographic Society of Great Britain.



good as A and B, or B and C, owing to the difference in focal length of the two lenses being greater than that in either of the other two combinations; but this combination is the least necessary, since its focal length must come very near that of the two B lenses, which are perfect. Out of six lenses we can thus



SECTION.—TWO-THIRDS SIZE.

make three perfect combinations, two intermediate ones, nearly as good for practical purposes—we may say as good—and one fair combination, five in all, besides three lenses of different focal lengths which can be used singly.

Such a set of focal lengths will suit almost all requirements, but if a larger range should be wanted, it is only adding another pair of lenses which can be combined with the rest.

I have such a set of lenses here to-night; they are not so large as the set I propose to have myself, nor so large as the mounts will take, but they have been lent me by Messrs. H. Anderson and Sons, the makers, for the purpose of showing how they work. I may say that I have examined this set with great care in all the combinations I have indicated above, and the definition is most satisfactory and pleasing in every case. By using such a set of lenses we practically secure the advantage of five sets of rectilinears with only three sets of lenses. But if anyone prefers to keep the pairs separate or to mount existing lenses in this way, whether one or many, of course it can be done perfectly easily by any respectable optician.

To facilitate putting the lenses in the mount and fixing the mount in the camera, it is much the best and quickest plan to use bayonet sockets everywhere; the gain by doing so is enormous, and there is really no danger of the cells working loose or falling out; from the nature of the construction this must be so.

So far, then, we have one mount into which one, two, or any further number of cells containing lenses fit, the mount being also fitted to the camera by a bayonet joint.

Now we come to the question of stops. The late Sir W. Siemens once said that if a man found out an important mechanical improvement he might as well throw it in the gutter as give it to the world not patented. This may not be universally true, but it is a fair illustration of the proverb that what is everybody's business is nobody's. As far as I can make out, the Iris diaphragm was first brought out in connection with microscopic work, and it does not seem to have been patented; at any rate, its father must have been a

very careless parent. It is curious that, having so simple and elegant a means of making an universal and perfect stop before our eyes for so long, we should go on contentedly using Waterhouse diaphragms. Fortunately, the more enterprising of our opticians are now alive to the advantages of the Iris diaphragm, and I cannot but think that in a short time separate stops will be things of the past.

I have adapted the Iris diaphragm to this universal lens mount. By moving the index of the diaphragm round, any sized opening is at once obtained. The index moves over a graduated dial, which, in connection with a small table, allows of any W.S. stop of each of the lenses being found in a moment. I do not think, however, in practice the majority of workers will go as far as this; having focussed, they will simply with one hand turn the diaphragm until the definition appears sufficiently uniform, and then, judging by the light on the ground glass, expose accordingly.

This power of being able to gradually decrease the size of the aperture while looking at the image, and without having to take one's head from under the focussing cloth, will be found a great convenience and facility in practice.

As regards the diaphragm itself, I have here the first one I had made. Since then, by going into its geometrical construction, I have been able materially to reduce the size over all. The one at present in the camera is less than  $2\frac{1}{2}$  inches over all for an effective aperture of  $1\frac{1}{2}$  inches. The diaphragm is operated by a collar working loosely on the outside of the lens tube, but not shown in the drawing.

The shutter which I have adapted to go with this mount and diaphragm is on the same principle as the one which was first exhibited at the April meeting of this Society in 1882. Since then, naturally, a great many improvements have suggested themselves for securing both increased efficiency and simplicity. The action of the shutter—or exposur, as I prefer to call it, since its functions permit of considerably greater scope than the usual types of shutter—will readily be seen from the diagram.

L L is the lens tube fitted with bayonet sockets to take the lens cells at each end.

S S is the socket which fits into the flange on the camera front.

D D is the space in which the mechanism of the Iris diaphragm is situated.

R and F are the shutters. They are made of thin stiff plates of aluminium. Each shutter is fixed to a steel rod, and round the rods are coiled the springs which form the motive power for working the shutters.

Towards the top of the diagram levers will be noticed working on a pivot, P. These levers engage in slots in the steel rods, and hold the shutters in their places when set. In making an exposure, one shutter rises and the other falls; they act quite independently of each other, and their movement is very rapid, so that the full aperture is obtained nearly for the whole time of even the shortest exposure. The mechanism for working the shutters is as follows:—In the space marked C is a spring and small train of clockwork controlled by a revolving fly, a good deal like the striking train of a clock. A small lever is arranged, so that under ordinary conditions it prevents the fly from turning round; the lever is, however, connected to a simple pneumatic release, so that if the spring be wound up, and the ball pressed, the fly revolves until the spring has made one turn, or until the pressure on the ball is taken off, when the lever again stops the fly. Connected with the spring is a disc, B, which will be seen standing out in front of the shutter. The milled head on the arbour passing up through the centre of this disc is for winding up the spring. When the spring is wound up and the fly released, this disc revolves. The spring is arranged just to make one complete revolution. On the disc projecting inwards are two pins; one is fixed, the other (E) is movable, and can be set in any one of a number of holes arranged round the circumference of the disc, as shown in the front view. As the disc revolves, the pins catch in the ends of the two levers, which will be seen in the diagram, projecting close underneath it. These levers, as I have already explained, work the shutters.

In the shutter I have here the disc is made to revolve in three seconds. By setting the moveable pin further and further back from the fixed pin, any exposure can be given between  $\frac{1}{4}$  second and  $2\frac{1}{2}$  seconds. These are, I think, the most generally useful limits, but there is no difficulty whatever in altering the limits to  $\frac{1}{8}$  second, and  $1\frac{1}{2}$  seconds or even further, if any one should wish it.

I do not, however, look on the utility of the shutter so much as an instantaneous shutter, as a means whereby such exposures



as  $\frac{1}{2}$ ,  $\frac{1}{4}$ , and  $\frac{1}{8}$  seconds, which are most useful in ordinary practice, can be given with facility and accuracy.

For longer exposures than the shutter will give by itself the clockwork is stopped by releasing the ball when the first shutter has risen. After the requisite exposure has been given the ball again pressed, when the second shutter falls. The shutter therefore replaces the ordinary cap in all its functions, so that it is no longer necessary.

This completes the description of the apparatus. The one I have here is a little over 5 inches long by  $2\frac{1}{2}$  inches broad, and the diaphragm is  $1\frac{1}{2}$  inches in diameter, or large enough to give  $\frac{1}{2}$ , with a 12-inch focus lens, so that it is sufficiently large for anything from  $\frac{1}{2}$  plate up to 10 by 8. This, I think, is a handy general size, but for use with a  $\frac{1}{4}$ -plate camera and lenses a smaller one could be made not larger than a moderate sized snuff-box; or, of course, larger ones could be made to suit circumstances.

The whole apparatus, including the six lenses, will pack in a space 6 inches by 3 inches by 5 inches.

### Notes.

In answering our correspondents, we often frankly confess our complete inability to answer the numerous legal questions put to us by our readers; many of these questions bearing so specially upon photographic trade questions as to be somewhat out of the ken even of the ordinary legal adviser, unless he happen to know the full meaning of the trade and technical terms involved. Our readers will be pleased to hear that we have arranged for a series of articles on "Law for Photographers," by a solicitor who has had special experiences in conducting cases relating to photographic matters.

The first of the articles on "Law for Photographers," by the solicitor in question, S. J. Debenham, will be found on p. 306 of our present issue.

One difficulty which photo-etchers have to contend against in the City is the vibration caused by the incessant traffic. This vibration is felt even in the most solidly-built house, and the amount, to those who have had no experience of it, would appear incredible. In several of the City houses the effect is counteracted to some extent by placing the camera and the object to be copied on a large swinging-table, so that whatever motion there may be is simultaneous. But the difficulty is not entirely overcome, and the faulty reproduction of drawings where there is much fine work is often due to this cause. Some photo-etchers prefer to have their studio in the suburbs; although this entails the trouble of carriage, yet the superior results more than compensate the extra time and expense.

One effect of the competition of photo-etching with wood engraving is to bring down the price of the latter. The wages of wood engravers not in the first rank have been seriously reduced during the last three or four years, the reason, so it is stated, of the photo-etchers working so much cheaper being the number of apprentices which are employed. This may be so, but we fancy the severe competition between photo-etchers themselves has had something to do with it. The tendency has been to cut down prices, not to produce good work, and consequently we hear

of as much grumbling among the etchers as among wood engravers.

A new terror has been added to what are known as first-class cricket matches. Hitherto only the most ardent of cricket enthusiasts have been able to endure the dreary lengthening out of the proceedings, and even these have pathetically entreated that there might be a little more "play" and a little less of what may be called dawdling, for want of a better term. The two hours and more absorbed by luncheon are an especial grievance, and it does seem a long time unless the appetites of cricketers are abnormal. This interval, on the occasion of the match of the Australians against Surrey this week, was increased by half an hour, because the teams had to be photographed. Why the public, who only go to see the cricket, should be kept waiting while the players have their portraits taken is difficult to explain, since it would be so easy to photograph them before the wickets are pitched. It is to be hoped, for the sake of the patient devotees of the national sport, that in future this practice of introducing photography in the middle of the game will not be followed.

As a fresh illustration of the value of photography as an accurate register of pathological facts, we may allude to the marvellously detailed photographs of diseased eyes, recently taken by Professor Colin, of Breslau. He uses the magnesium flash light, and, remarkably enough, the patients are none the worse.

The Arts Section of the Glasgow International Exhibition seems to be thoroughly appreciated, and it is fairly representative. In this section is included a good collection of photographs.

When the striking reality of the stereoscopic image came as a new marvel on the world almost a generation ago, the stereoscope was essentially the feature of the shop windows and of the table of the evening party. In the windows of druggist shops, stationary stores, print shops, and even the drapery establishment, the street lounge found row after row of stereoscopes placed ready to eye, and in which he could see visions of near and far-off lands, solid but frozen dead.

Now all is changed: the stereoscope scarcely exists in any other shops than in the pawn shops and stores of second-hand goods, while anyone wishing to make a collection of slides had best go and search among the stalls at the variety sale which is held every Friday at the Hol-loway Cattle Market.

It is no new thing to conjecture as to the reason of this great decline in the popularity of the stereoscope, and inventors of new forms of stereoscope have time after time attributed it to the inconvenience of the instruments used, and brought out their new forms with confident prediction as to a stereoscopic revival. Yet every one of the new forms has fallen flat—even the wonderful lantern stereo-

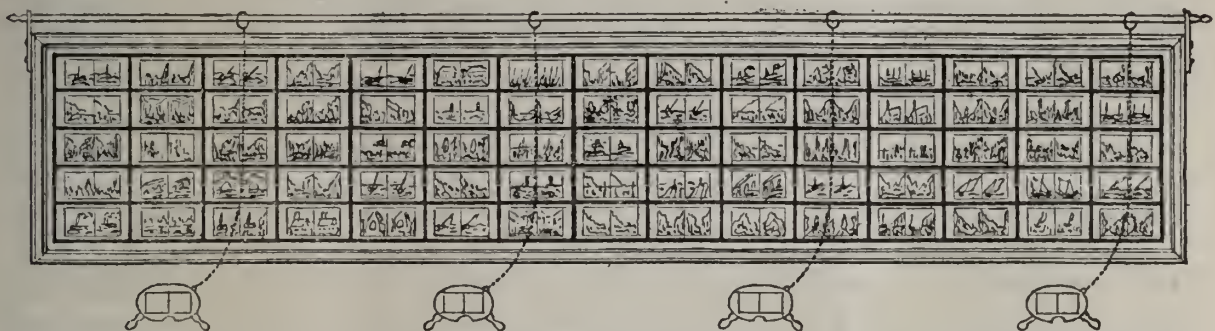


scope of A. Stroh, by which true stereoscopic effect is obtained on the screen.

Mr. Stroh, whose paper on stereoscopic photography was commenced in the *News* of last week, and is finished in our present issue, appreciates the stereoscope, and with the view of making others take pleasure from that which he delights in, leads us from the most complex form of stereoscope to the simplest, and tells us how we can

organize a stereoscopic exhibition where every picture may be placed on the walls, and can be seen about as easily as an ordinary photograph.

Mr. Stroh takes the optical system of an ordinary stereoscope, and mounts it spectacle fashion, so that the wearer can look from slide to slide as easily as in the case of ordinary photographs; and the accompanying cut shows several of the stereoscopic spectacles chained up



against a frame of slides; an arrangement recently on exhibition at the Camera Club. Incidentally, we may suggest that the rail on which the rings slide would, perhaps, be better under, rather than over the frame.

Lewis Lyons, who has given a good deal of evidence as to "sweating" in the tailoring trade, produced on Wednesday, before the committee, a number of sketches of sweating dens where the "best coats" were made. These sketches may have been very accurate, but we wish they could have been photographs.

During the first years of its existence the Photographic Society used to indulge in considerable feasting. To quote the words of the President uttered on the occasion of the presentation of his bust, "There never was a meeting without a *recherché* banquet." For a long time past, however, there has been a tendency towards a Spartan discipline, and it is questionable whether the extreme has not been reached in this direction. A happy medium would be the right thing. We note the fact, because the Photographic Society, which has moved to larger premises on account of the increase of its members, has this month had its annual dinner. It was at first intended to celebrate the occasion by an exhibition of photographs and apparatus; but it was finally determined to have an exhibition only of apparatus now, and to defer the exhibition of photographs until the autumn. The exhibition of apparatus has been open during the week, and will close on the 21st inst. The French Society is following the example of the English Society in having an exhibition; the latter might imitate the former by having a dinner.

Some months ago were published the adventures of the enterprising Yankee photographer who boldly shouldered his tripod and started off in the track of a

cyclone which had been—to use a colloquial Americanism—"cavorting around" his neighbourhood. If our memory serves us, that energetic operator had (to use another American idiom) a "pretty considerable bad time of it;" and the end of it all was that, instead of taking the cyclone which he endeavoured so gallantly to stalk (in a scientific sense, of course), that cyclone "took him" unawares, and deposited him with his apparatus on the top of a barn, from which he had to be "salvaged" at a great expense by the local fire escape brigade. At all events, even if we have not remembered the details correctly, our impression is that the cyclone still remains untaken, so that photographic Alexanders who are sitting on their "property" chairs, and weeping for fresh worlds to focus, can pack up at once and start for the latitudes which may be considered the cyclone's lair.

Meanwhile, as though to put our professional brethren on their mettle, an amateur has actually "been and gone and done it," in a photographic sense, so far as Mount Vesuvius is concerned. Not only has this bold young man taken the crater from well-nigh as many points of view as though it had been an Irish-American pugilist or a professional beauty, but he lives to tell the story, and, in fact, has told it in the columns of an evening contemporary. Most of his negatives of the crater—which, to judge from his verbal description of the scene, seems to have been permeated with "a blinding, suffocating, sulphurous mist"—must, we think, be like the old kinds of battle painting our grandfathers used to delight in, in which all the details were conveniently enveloped in a fiery smoke; or may possibly resemble an "impressionist" artist's view of "Firework night at the Crystal Palace," or "The wild Irishman steaming north in a mist." But be this as it may, the fact remains that the crater of an active volcano has been taken, and may be added to the already long list which now includes pistol flashes, express trains, forked lightning, and, if we mistake not,



the very latest thing in blizzards. We may be sure, then, that the so-far untamed cyclone may consider itself as captured, and that the appearance of its authentic portrait in our shop windows is merely a question of time.

### CHROME ALUM; ITS PURIFICATION AND CORRESPONDING DOUBLE-SALTS.

BY JOHN SPILLER, F.C.S.

At the April meeting of the Photographic Society, a paper by W. K. Burton was read, entitled, "A few words on Emulsion Making, and on the Development of Gelatino-Bromide Plates, especially concerning the use of Chrome Alum." A lively discussion followed the reading of this paper, and all the speakers agreed in saying that the communication was not only valuable in itself, so far as regards the facts stated, and the radical mode of conducting the experiments, but that its general character was highly suggestive of further research.

One of the points raised was the question of acidity, and, when present, how was the excess of free sulphuric acid in the chrome alum to be got rid of? I ventured to offer a suggestion at the moment, and our secretary, W. F. Donkin, followed with another plan; but since then I have been working at the subject, and hit upon a really good method of testing, and, if needful, purifying the chrome alum for use in these delicate operations. Every chemist knows the extreme difficulty of recrystallizing chrome alum on account of the long time required for the formation of the crystals; and when it is remembered that this salt is ordinarily prepared by heating potassium bichromate with an excess of oil of vitriol, the presence of a certain amount of free sulphuric acid in the first crude product would seem to be inevitable. Now with common (alumina) alum, nothing is easier than to get rid of the free acid by recrystallizing the salt once or twice from plain water—a process which cannot be carried out with anything like the same facility in the case of chrome alum.

The idea occurred to me that it might be possible to wash away all traces of free sulphuric acid by treating the finely powdered crystals with ordinary methylated spirit (sixty over proof), and this I find to be the best known method of purification. Chrome alum itself is absolutely insoluble in alcohol, but the few samples I have tried all gave up an appreciable amount of sulphuric acid by shaking with methylated spirit. Take half a pint of spirit to four ounces of chrome alum (very finely powdered), stir well together (or shake up the mixture in a bottle for five or ten minutes), pour it on to a filter, and use two ounces more spirit for washing the crystals. The spirit used (twelve fluid ounces) need not be lost, for it is easy to put it into a pint retort mounted on a hot water bath, and recover nearly the whole of the spirit by distillation. In all my experiments a brown oily residuum was left behind, powerfully acid to test paper and to the taste, and giving a bulky precipitate with barium chloride, yet not containing a trace of chromium.

These facts seem to show that ordinary commercial chrome alum does contain an appreciable quantity of free sulphuric acid. It is easy to make a test tube experiment with any given sample, receiving the filtered spirit in a porcelain capsule, and evaporating over a water bath nearly to dryness. Test paper or the tongue will settle the question of purity before proceeding, perhaps needlessly, to treat the whole bulk of the sample.

So much, then, as to the method of purification. I next tried the acetate of lead plan, which I ventured to suggest at the Photographic Society's meeting, pushing the action on to the extent of converting nearly the whole of the chrome alum into the corresponding double acetate, and examining the properties of this salt. I find it is a viscid, uncrystallizable compound, extremely soluble in water, and

capable of hardening gelatine, but I have not tried it in emulsion for photographic purposes, seeing no advantage in its use over the purified chrome alum, which W. K. Burton says "has no slowing effect on an emulsion." The aqueous solution of the double acetate of chromium and potassium prepared as above has a very remarkable dichroic character (purple by transmitted light, and green by reflection); and, contrary to analogy, is not precipitated by long boiling. It is well known that the ferric and aluminic acetates suffer decomposition by boiling with water, losing part of their acetic acid, and being thrown down as basic acetates. Not so with chromium, the affinity for acetic acid being sufficiently powerful to prevent it at a boiling temperature—a fact which was probably not known to Henry Watts in 1863, or he would have specially mentioned it at page 14, Vol. I., of his famous "Dictionary of Chemistry."

I am now examining the double nitrate in the same way, preparing it by adding barium (or lead) nitrate to chrome alum in as nearly as possible the proportion of their atomic weights.\* The double oxalates are well known. I prepared the remarkable black or dark blue dichroic salt when a student in the Royal College of Chemistry, about the year 1850, from instructions given in Gregory's Outlines, or Fownes's Manual of Chemistry. It is a most interesting object for the physicist, and may possibly work in some day with the photographic processes, either for hardening a gelatine plate, conferring upon it some special orthochromatic property, or being used in the way suggested by Burton as a possible addition to the ferrous-oxalate developer.

### ON STEREOSCOPIC PHOTOGRAPHY.

BY A. STROH.†

#### *Binocular Perspective.*

WITHOUT exactly entering upon the theoretical field of binocular vision, I have to say a few words respecting it, in order that we may recognise the best conditions for the production of stereoscopic pictures.

If we look at an object with both eyes, the line of sight of one eye forms an angle with that of the other, and the one eye necessarily receives an image of that object, slightly different from that seen by the other eye. Upon this angle of vision, as it is called—or, in other words, upon the differences of the images received by the two eyes—mainly depends our estimation of depth of solid objects, as well as distance between objects in the direction of the line of sight.

The nearer we are to an object, the greater is the angle of convergence of the lines of sight, and the better are we able to judge of the depth and solidity of such object. But as the distance between the observer and the object increases, this angle diminishes until the lines of sight become almost parallel. The image in one eye is then practically identical with that in the other, and under these circumstances we no longer perceive what is called binocular perspective.

It is for this reason that distant scenery seldom makes a good subject for the stereoscope; the two pictures in such a case being so nearly alike that we fail to obtain thereby stereoscopic relief or perspective. We should, therefore, choose subjects at not too great a distance for stereoscopic pictures, or, if we take distant views, care should be taken to have a foreground, without which our picture will look flat and uninteresting.

In order to obtain the effect of binocular perspective in the stereoscope, as we see it when we look at natural objects, we have to consider two distinct factors; these are the focal length of the lenses of the camera, and the distance between them.

Taking the latter condition first, a glance will tell us that we cannot do better than adopt for the separation of our lenses the same distance which separates our two eyes, which is, on an average,  $2\frac{1}{2}$  in. There are, however, reasons for making the distance between the lenses somewhat greater, since the pictures cannot be larger than  $2\frac{1}{2}$  in. if the lenses are only that distance apart. Pictures somewhat larger can be obtained, increasing the

\* Four molecules of barium nitrate ( $130.5 \times 4 = 522$  parts) are required to remove the sulphate from 503 parts (one molecule) of chrome alum.

† Continued from page 296.



distance between the leusca, the necessary consequence, however, being distortion in the shape of exaggerated perspective.

If not carried too far, this exaggeration of perspective is permissible, and is almost necessary, for many persons cannot appreciate binocular perspective in the stereoscope at all, unless it is exaggerated, and very few persons indeed can detect a moderate exaggeration of perspective.

Our power of correctly estimating distances in the direction of the line of sight by binocular vision is an acquired faculty, the extent of separation of our eyes being arbitrary, and we should be able to do it as correctly if our eyes were further apart from each other. If it were possible for the distance between the eyes to be suddenly augmented, we should for some time see everything in exaggerated perspective, until we should gradually associate again in the mind the true dimensions of things with their images, as seen by our eyes. If, then, the distance between our eyes were suddenly restored to its former condition, we should see for a time everything in flattened or diminished perspective, until we again became used to the altered state of things.

In order to verify this fact experimentally, I have constructed an instrument which proves it in a striking manner. A A, fig. 5,

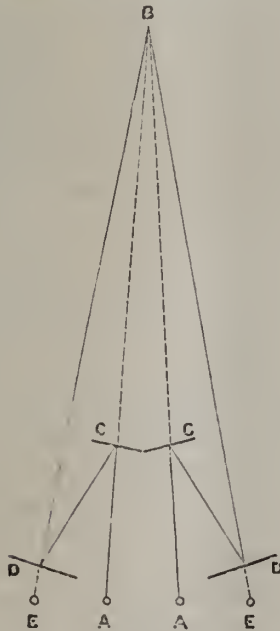


Fig. 5.

represents the two eyes of an observer looking in the direction of an object, B. The view is intercepted by reflectors, and the image of B can only be seen by the double reflection from the reflectors C C and D D. The result of this arrangement is the same as if the two eyes were looking from the points E E, and, therefore, a much larger angle of vision is obtained.

The instrument is so constructed that the distance between the reflectors D D can be varied up to about 12 inches, so that an observer has thereby the means of gradually increasing his angle of vision. Any one looking through this instrument at another person's face, for instance, at about 4 feet distance, will see the face become more and more elongated in the direction of the line of sight, as the reflectors are more and more separated from each other.

If, after gazing intently for a minute or two at this exaggerated perspective of the face, the observer suddenly looks over the instrument at the face direct, the contrary effect is produced, and for a short time the face appears perfectly flat, and without any perspective.

From what is said above it appears that it is by no means necessary to adopt the distance between our eyes accurately for the extent of separation of our lenses in constructing a stereoscopic camera, although we must be guided to some degree by that distance. But there is nothing to guide us, so far as I know, in determining what should be the focus of our lenses, except trial or experience; and I should expect to find consi-

derable diversity of opinion on this point. All I do is to give my own experience.

I have experimented with lenses varying in focus from two inches and a half to ten inches, and have come to the conclusion that lenses with an equivalent focus of five inches and a distance of two inches and three-quarters between their axes are about the best proportions when exaggerated perspective is not desired. For a moderate exaggeration, however, the distance between the lenses may be increased to three inches, and their focal length may also be reduced to four inches.

Lenses with too long a focus have the disadvantage of taking very little subject in the limited field of a stereoscopic slide; they have, moreover, the effect of diminishing perspective; while lenses with too short a focus certainly include more subject, but not without the consequent disadvantage of over-exaggerating the perspective. It is true that the disadvantages of too long a focus may be compensated by a much greater distance between the lenses; but in that case the relation between binocular and geometrical perspective is no longer such as we are accustomed to. The result, therefore, must be more or less unnatural.

Volumes might be written on this subject; but I trust what I have said may prove useful to those who are thinking of taking up stereoscopic photography, and if by bringing this subject before the Camera Club I have stimulated, even to a small degree, a revival of this beautiful and fascinating branch of photography, my object will have been attained.

### A FAULT IN STRIPPING FILMS.

BY JAMES M'GLASHAN.\*

THE matter I bring before you does not call for any lengthened remarks on my part, but so much interest had been taken in the Eastman stripping films by both amateur and professional photographers, that I thought even a short statement of a possible cause of failure might be of interest, and enable those who use them to save both time and patience.

I had occasion to use, during last summer, a large number of these films, and was pleased with the results, having then been invariably successful in stripping them and producing good negatives.

About a month ago, however, I tried a roll which I got in July last year, and which had never been opened and kept in a quite dry place in a drawer. I was surprised to find that the paper support would not strip from the sensitive film, although I tried long immersion in hot water and water nearly boiling. The once soluble substratum had become insoluble.

I then tried a piece of a roll which I got more recently—say a month later, and which I knew to be perfect at first—and in it I found the same fault existed, although to a less extent, as I managed with considerable difficulty to strip it.

The remedy for this, of course, is only to use films which are comparatively new, or probable failure will be the result.

If one considers what must be the process of manufacture, the cause is quite apparent.

The paper will be first coated with a plain gelatine, and this will be allowed to dry wholly or partially. The emulsion to which chrome alum has been added is then spread over this, and some of the chrome alum, although it may be an infinitesimal quantity, is bound to permeate the plain gelatine, and it will be only a question of time when the whole film will become insoluble. Of course keeping the film in a damp place would aggravate the evil, but it will not keep long, I think, under the very best conditions.

Another thing which must be observed with these films is that they must be stripped immediately after development and fixing, because if allowed to dry they become insoluble from the same reason that I have stated—that is, that the chrome alum finds its way from the one portion of the film to the other, which becomes insoluble on drying.

### Patent Intelligence.

#### Applications for Letters Patent.

6,793. A. FREY HARTZOG, 8, Quality Court, London, W.C., for "Improvements in photographic apparatus."—May 7th, 1888.  
6,814. SAMUEL MARK CLARK, 172, Fleet Street, London, E.C.,

\* A Communication to the Edinburgh Photographic Society.



for "Improvements in and relating to photographic apparatus."—May 8th, 1888.

6,917. ALFRED JAMES, 76, Chancery Lane, London, W.C., for "A new and improved apparatus for trapping and removing the smoke given off by photographic magnesium and other lamps."—May 9th, 1888.

6,992. MICHAEL TAYLEURE, 6, Lord Street, Liverpool, for "Improvements in dark slides or plate holders for photographic cameras."—May 10th, 1888.

**Patent on which the Fourth Year's Renewal Fee has been Paid.**

7,201 of 1884. T. SAMUELS.—Photographic cameras.

**Patent which has become Void through Non-payment of the Fourth Year's Renewal Fee.**

2,767 of 1884. F. W. BRANSON.—Photographic shutters.

#### Specifications Published.

9,402. WILLIAM TYLAR, 31, Yates Street, Aston Road North, Birmingham, Dealer in Microscopic and Photographic Apparatus, and Commission Agent, for "A combined folding metal washing, draining, and drying rack for photographic use."—Dated July 2nd, 1887.

The Patentee says:—

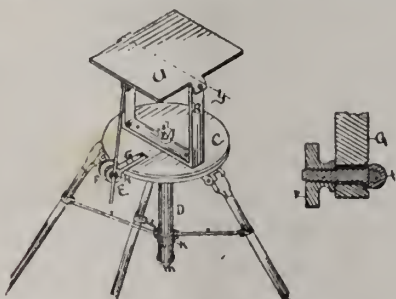
My invention consists of a metal rack in which the plates are isolated from each other and from all contact with the metal of which the rack is composed, thus preventing scratching or staining. This I accomplish by using a specially made wire or thin metal sheet grooving covered with india-rubber, gutta-percha, celluloid, or other suitable soft and waterproof material. Wherever plate touches it rests on this covered wire or sheet metal. This grooving can also be used in plate boxes or other photographic goods in which it is necessary to isolate plates. The framework is wire, so that current of water or air is not impeded. There are attached handles, and a trough for holding drainings, also attached struts for rigidity when open.

#### Patents Granted in America.

378,430. WILLIAM H. CARPENTER, Cadi'lac, Mich., for "Camera-Tripod."—Filed July 23rd, 1887. Serial No. 245,064. (No model).

*Claim.*—1. In a camera-tripod, the combination of an upper plate, A, adapted to be revolved upon a double standard, B, vertically with said standard B, rigidly attached to or forming a part of a lower plate, C, substantially as and for the purpose set forth.

2. In a camera-tripod, the combination of the plate A, the double standard B, and the plate C, with the lower plate, L, said plate C being adapted to be revolved horizontally about a centre



pin s, upon the plate L, or to be rigidly attached to plate L by a thumb-screw, I, on the centre pin, s, as and for the purpose above set forth.

3. In a camera-tripod, the combination of an arm, G, attached to or a part of a plate, C, and provided at its outer end with a clamping-bolt, H, with a rod, E, attached at its upper end by a flexible joint to the plate A, and passing through the clamping-bolt, H, substantially as above set forth.

4. The combination, with a camera tripod, of a magazine or dark chamber attached to a lower plate, L, of the head to which the legs of the tripod are attached, said magazine being situated between said legs and attached thereto by brace-rods r, substantially as above set forth.

5. The combination, with a camera tripod, of a magazine or dark-chamber of two concentric tubes D and Q, of such diameters that Q is adapted to slip within and closely fit D, substantially as above specified.

6. The combination, with a camera tripod, of a magazine consisting of two concentric tubes, provided with a slot o, in the outer tube, D, adapted to engage the pins n of the inner tube, Q, with said pins n of said tube Q, substantially as above set forth.

7. The combination, in a camera tripod, of a magazine composed of two tubes D and Q, the tube D being rigidly attached to the under side of the plate L, and closed at its top by the plate L, and the tube Q being permanently closed at the lower end by the fixed cap m, and the upper end closed by a movable cap, t, all substantially as above set forth.

8. The combination, in a camera tripod, of a magazine or dark chamber attached to a plate, L, and provided with a sliding collar K, which is attached by flexible joints to the legs of the tripod by brace-rods, r, substantially as above set forth.

## Correspondence.

### THEORETICAL CONSIDERATIONS IN EXPOSURES.

SIR,—I cannot defend the two stupid errors contained in the paper I read before the Photographic Society last Tuesday, but what I feel is that it would have been charitable on the part of the council to have pointed out the mistakes before printing the paper. It is usual in most societies to refer a paper to some competent member of council, and when it is found that a well-known law has been overlooked, producing a ridiculous result, the custom is to consider whether through oversight or ignorance such a law has been disregarded. If it is supposed to be the former, the writer's attention is called to it for correction; if the latter, the paper is rejected. Anyway, it could hardly have entered the mind of the referee that I had no knowledge of the common "law of squares" applied to light, and by its application the absurdity would have disappeared, especially as I give the correct formula immediately after showing equality of illumination for objects at all distances. It is a common thing for an author to read a paper again and again, and still remain blind to an error, because he has got used to the appearance of sentences, and if pointed out would at once see it. Errors in a paper may throw doubt upon the whole, even when they only arise in a side issue.

Now it is evident we see the stars, simply because the distance of an object does not detract from the intensity of its light (see Tyndall's Optics, Sir John Herschell's works, &c.), provided always that no loss of light occurs between the eye and the object sufficient to be noticeable. Again, if the atmosphere did not exist, photography would be impossible, and everything would appear as electric lights upon the screen, because the light at the earth's surface would be more intense than anything we can imagine.

The next error is an obvious oversight, and should have read: "Objects moved along the line of depth of focus, when this is infinite, do not alter appreciably in size." This is because the rays are nearly parallel. The example suggested, that a ship two miles off and one a mile off appearing one size was not the case, is incorrect, for with a very short focus lens it would be so. There might be a slight difference, because the rays are not perfectly parallel, but the smaller the stop the nearer would the ships appear to be of the same size.

The hypothesis of  $\frac{1}{100}$  inch diameter for points in the image is rather a large allowance; hence it is that a point considerably farther off than  $f + 100 f^2 R$  must be looked for, where objects would not alter their dimensions appreciably in various planes beyond. The pinhole camera has no bearing on the case; its depth is infinite, starting from the camera itself, but the distance beyond which an object would not appreciably alter its size if moved away from it, would be subject to the same law,  $f$  here being equal to the distance of the image from the pinhole.

One word on the efficiency value of lenses.



This, I maintain, would be of great value, notwithstanding that it would only be fairly accurate at the time of testing. For any maker we should have fair comparisons, and I have no doubt that many of the difficulties suggested, and rightly enough, are small compared with the value obtained in a general test. The optical centre varies for every conjugate, and there may be more than one optical centre. For all this, wherever the point or points may lie, a mean can be found sufficiently accurate for general work; so near, indeed, that the error would probably be no larger than one-sixteenth of an inch when at maximum.

The form of equation I gave for depth of focus has many good practical applications, and I hope to get it into a form useful for photographers in general, and read a short paper on the subject. I will give a case under my own notice, leaving out the names of makers, &c., not to be unfair to them. I required a lens for taking children life-size, instantaneously, say one second's exposure. Mr. Dallmeyer could find no lens in his series to suit me. Through a London firm I made an application to one of the very best known foreign makers, and the reply was that they could make the lens to do all required. It was to be 5 inch diameter, and 33 inches (or thereabouts) equivalent focal length. Before doing anything further I began the investigation necessary to see how far this lens would fulfil the requirements. The equation for depth of focus which I gave in my paper was the result, viz. :—

$$D = \frac{2(\Delta - f)}{\frac{100f^2R}{\Delta} - \frac{\Delta}{100f^2R}}$$

Where D = depth of focus

$\Delta$  = distance of object from the lens

$f$  = camera extension (i.e., focus)

R = ratio.

To simplify, let  $\Delta = nf$  where  $n =$  a number,

$$\text{Then } D = \frac{2f(n-1)}{\frac{100fR}{n} - \frac{n}{100fR}}$$

And to express this by stop numbers marked in the decimal system, if D S = stop number

$$D = \frac{2f(n-1)}{\frac{f\sqrt{1,000}}{nDS} - \frac{n\sqrt{DS}}{f\sqrt{1,000}}}$$

This last expression is very easy to apply in practice, although it is not evident when looked at.

To apply these formulæ to the case given. It is clear that when  $\Delta = f$  or  $n = 1$  that  $D = 0$ . The interpretation is that depth of focus does not exist at all when copying equal. Consequently the eminent lens maker had proposed an absurdity, which I believe was afterwards admitted. This shows why life sized heads cannot be obtained sharp, or, in fact, anything approaching to good definition. My proposal to make a lens especially for large heads arose out of this, by giving a negative curvature of field. Astigmatism, &c., may step in, but I would venture to recommend a trial, for the evils introduced may prove less than those existing, with the advantage of a quick exposure, since depth of focus would not depend on the stopping down.

I am sure that you will forgive so long a communication for two reasons: one that I wish to set myself right, after making the errors I did, knowing better at the time; and the second, because some of the questions discussed may prove of interest to your readers.

Although, as before stated, I in no way wish to excuse myself, I felt somewhat aggrieved at a mine being sprung upon me at the eleventh hour.—Yours faithfully,

DAVID SALOMONS.

Broomhill, Tunbridge Wells, May 14th.

## HYDROQUINONE DEVELOPER.

SIR,—I have read with interest Dr. Kenyon's paper in your last issue, and should like to make one or two remarks on the subject. When I brought it forward last year at a Technical Meeting of the Photographic Society, I stated that the mixed developer could be used over and over again, and would last almost indefinitely. It should be added that this is only the case if it is kept in a closely-stoppered bottle, so as to avoid oxidation. Some little time ago I tried a solution which had been left standing in an open measure-glass for several days, but had not changed colour much. It still acted, but very slowly, giving in about an hour an image which, after fixing, was white by reflected, and pale brown by transmitted light.

Dr. Kenyon says that hydroquinone has a strong tanning action on gelatine, and warns us against using it for stripping films. I do not quite understand whether he has used it for stripping films, and has found that it prevents them from stripping; anyhow, my own experience is diametrically opposed to this. Having eight films  $7\frac{1}{2}$  by 5 inches to develop, I made up four ounces of developer, thus: 1 oz. of hydroquinone solution (6 grs. to the oz. with 20 grs. potassium meta-bisulphite), and 3 ozs. of the solution of mixed sodium and potassium carbonates as usually employed with pyro for strippers. No bromide was added. I immersed the eight films successively, and kept them constantly moving. They began to develop in about two minutes, and in about fifteen minutes I judged them to be fully developed. On subsequently transferring to collodionised glass in the usual way, they all stripped in warm water with delightful ease, giving brilliantly clear negatives of the purest neutral tint. A negative from the same roll developed with pyro instead of hydroquinone, all other circumstances being the same, obstinately declined to strip in boiling water. I am told that this is obviated by diluting the developer considerably. I have not tried this yet, but anyhow my single experiment with hydroquinone makes me fancy it a good deal for strippers.—I am, yours faithfully,

W. F. DONKIN.

May 14th.

## DIFFUSION OF FOCUS.

SIR,—I might be content to let Mr. T. R. Dallmeyer's last letter pass without reply, but that he charges me with unfairness in dealing with his own previous communication, and with reversing the sense of the quotation I gave from Mr. Chapman Jones: two charges which are entirely unfounded.

When a writer claims three distinct advantages, and puts them into separate paragraphs as 1st, 2nd, and 3rd, as Mr. Dallmeyer did in his letter of April 27, each claim may fairly be considered by itself, unless there is something in the paragraph relating to it to show that it must be taken as qualified by what precedes or follows; and of this there was no indication.

With regard to my quotation from Mr. Chapman Jones, Mr. Dallmeyer says, "Mr. Debenham does not grasp the situation at all," and adds that planes "within the focal point" correspond to objects in the background. Now it is true that the expression quoted is ambiguous, and if it stood alone might refer to either background or foreground. Mr. Jones, however, by saying that the gain there was undisputed (which, by the way, it was not), and that he might pass it by, and then proceeding to argue for those planes of definition which would correspond to objects in the background when a foreground object was focussed, showed plainly enough that the words within the focal point must be construed in the sense in which I quoted them.

I do not accuse Mr. Dallmeyer of having wilfully reversed the meaning of the quotation in order to put me in the wrong; presumably, he did not refer back to the original, although, when quoting, I gave the page where it might be found.



Mr. Dallmeyer calls my reference to the beard in a portrait as representing the foreground "a very feeble paragraph." This, however, is not argument, and I am sure photographers will appreciate the disadvantage of a rosy definition of this appendage, and of neglecting, as far as possible, the foreground which it represents.

Mr. Dallmeyer has, within the last few weeks, made a fundamental alteration in the claim for depth of focus, by admitting neglect of foreground planes, and claiming an advantage for background planes. This is an entire change of front, and might afford ground for a fresh argument, but it is not at all the same thing against which I have been arguing, and against which Grubb demonstrated twenty years ago. If it had been intended to limit or qualify the claim to definition on one side of the focus only, why was this not done at the time, in reply to Mr. Grubb, or why is it so late in the day that a change of claim is made?

Mr. Dallmeyer says I "entirely ignore, as might be expected," that "in a lens perfectly corrected for spherical aberration there is and can be only one point perfectly defined, and the remainder entirely out of focus. In the other case, by introducing positive spherical aberration in the lens, there are wide limits of partial definition corresponding to both background and foreground." To this I submit that, if by out of focus is meant, as will be generally understood, out of focal definition, the statement is contrary to the fact. With a perfectly corrected lens, as with one possessing spherical aberration, there are limits of partial definition, as the plate is removed more or less from the focal plane. Grubb's demonstration was to show that these limits are wider with the corrected than with the uncorrected lens.

Mr. Dallmeyer's concluding remark, that he "cannot personally afford the time to further educate Mr. Debenham," is a feeble impertinence which will, I should think, impose on but few, and of which his maturer judgment will probably disapprove.—Yours, W. E. DEBENHAM.

#### THE "MEAN" OF COMPOSITES.

SIR,—In the PHOTOGRAPHIC NEWS of two or three weeks since, a communication appeared from Mr. Francis Galton, in which he pointed out the desirability of securing the "mean" of a selected group of portraits in preference to the "aggregate," the latter, hitherto, having been the accepted outcome. In the communication which I forwarded to the NEWS of last week, I took occasion to maintain that the geometric super-position of the component negatives is the preferable method of securing the desired result. Your compositor, however, assumed "mean" to mean "meaning," and having thereupon substituted the latter word, he, by consequence, perfectly succeeded in rendering the passage *meaning-less*.  
Bristol. W. MATHEWS.

#### A PHOTOGRAPHIC CLUB FOR MILE END.

DEAR SIR,—I have to inform you that a photographic club has been formed in connection with the People's Palace, Mile End, E. The officers are:—*President*, Sir Edmund H. Currie; *Vice-Presidents*, E. Howard Farmer, Esq., F.C.S., and Robert Mitchell, Esq.; *Committee*, Messrs. Albu, Downing, Farmer, Gamble, Hawkins, Hellary, and Lawday; *Librarian*, Mr. William Ludlow; *Hon. Sec. and Treasurer*, Mr. William Barrett, 16, Clare Road, Forest Gate.

The Club is somewhat limited to its acceptance of ordinary members, for the rules provide that "persons entitled to be nominated as members of the Club are members of the People's Palace, and any persons who are or who have been students of the Photographic Class." Honorary members are nominated by the committee, and have all the privileges of the Club. The subscription for ordinary members is 1s. entrance fee, and 2s. 6d. per annum; while that for hon. members is any sum not less than 10s. 6d. per annum.

The inaugural meeting was held on Saturday last, an excursion to Hampstead being arranged for. About twenty members turned up, and after the day's work a group of the Club was taken, and then an adjournment to tea was found to be very necessary, after which some time was spent in a social manner. Mr. Hellary occupied the chair and sang a song, after which the Secretary spoke a few words, urging the members present to feel that the responsibility of making the Club a grand success depended upon them. Other songs were sung, and the meeting broke up, the members returning from Hampstead a little after 9 o'clock, conscious of having spent a pleasant and, I trust, a profitable day. WILLIAM BARRETT, *Hon. Sec.*  
16, Clare Road, Forest Gate, E., 14th May, 1888.

### Proceedings of Societies.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The usual weekly meeting was held on the 10th inst., W. H. PRESTWICH presiding.

J. J. BRIGNSHAW exhibited one of Lancaster's improved quarter-plate Instautograph cameras, the bellows racked out to a focus of 11 inches. It had all the necessary movements, was compact and light, and had no loose parts. He considered it a marvel of cheapness.

Some prints on Aristotype paper were passed round by F. J. Grammer, showing very fine detail.

J. B. B. WELLINGTON, referring to his statement the previous week, that plates developed with hydrokinone were liable to fog, showed some examples of  $\frac{1}{2}$ -plate negatives in proof of this assertion.

F. C. CEMBRANO had used the hydrokinone developer with a similar experience, but found it resulted from using pure carbonate of soda. The addition of a little bromide, however, rectified this. He had used Balagny's developer:—

Sulphite (25 per cent. solution)...	...	5 parts
Carbonate of soda (25 per cent. solution) ...	10 "	
Hydrokinone in alcohol (10 per cent. solution)	1 part	

If ordinary washing soda was used, the addition of bromide would stop development. He had found this developer work well for instantaneous exposures.

A. COWAN remarked that he had found no advantage at present in using this developer in preference to pyro and ammonia.

J. J. BRIGNSHAW exhibited a detective camera. The focus is regulated by a handle at the bottom of the camera working in a slot, by which also the camera is held when exposure is made. The plates are carried in dark slides, but they have to be transferred from the slide to the camera. In order to do this, the slide is placed vertically over a transverse aperture in the top of the camera; the bottom of the slide is now withdrawn, and the plate falls into a groove made to receive it at the back of the camera. The aperture is then closed, and the dark slide removed. After exposure the dark slide is again placed over the opening and the camera reversed, when the plate falls back into the dark slide.

F. P. CEMBRANO said he had recently seen some gelatinobromide prints developed; the subject being two children against a dark background. As development proceeded, the half-tones seemed to glide into the shadow, with the result that the heads of the children appeared surrounded by a halo. Different exposures were made of the same subject, using the same developer, with the same result in each case. Further experiments showed that this curious phenomenon only occurred when the half-tones of the picture were in contact with deep shadows. He promised, if possible, to obtain the pictures referred to, and show them at a subsequent meeting.

P. EVERITT exhibited some matt surface prints showing excellent results. The paper had been sensitized with ammonia nitrate fifty grains to ounce, and the prints toned with gold and platinum.

A Member asked what kind of camera-stand was considered the best.

H. C. TRINKS gave preference to a stand having sliding legs; they were of great advantage on uneven ground; he had found this kind of stand of great use in his continental tours.

F. A. BRIDGE advocated the brattice stand as being useful in travelling. To keep his stand and camera steady, if occasion



required it, he carried a piece of string with him, by which he was able to hang his camera case to the screw of the tripod head.

**NORTH SURREY PHOTOGRAPHIC SOCIETY.**

A MEETING was held on May 8th, at the West Norwood Constitutional Club, G. R. FLUDDER in the chair.

Mr. WOLFF showed the new Photographic Exposure Scale recently invented and introduced by Mr. Ackland. It consists of a square card, having attached to its centre three revolving dials, and is intended to be used in conjunction with the actinometer. With a knowledge of the sensitometer number of the plate to be used, and also of the actinic value of the light, Mr. Ackland's new scale gives, without any calculation, the correct exposure required for any given subject.

At the meeting on May 29th J. Thompson will lecture on "A Journey through Cambodia," illustrated with lantern slides.

It is decided to hold the first meeting of the season at Ewell, on June 2nd.

**CAMERA CLUB.**

ON Thursday, May 10th, Sir DAVID SALOMONS read a paper describing a simple apparatus for finding approximately the focal length and optical centre of any lens. LYONEL CLARK occupied the chair. Discussion followed the reading of the paper, and was taken part in by C. Beck, the Chairman, and Dr. Lindsay Johnson, who exhibited an apparatus used for finding the focal length of spectacle lenses.

During the evening A. STROH, by special request, again exhibited and described his detective stereoscopic camera. Much interest has been taken in this apparatus—Mr. Stroh's own production—as combining extreme ingenuity and excellent adjustment.

Previous to the paper, D. P. RODGERS exhibited a camera having a novel swing arrangement.

On Thursday evening, May 24, there will be a meeting of members.

**CARDIFF AMATEUR PHOTOGRAPHIC SOCIETY.**

THE customary meeting was held at their rooms, Working Street, on Wednesday, the 9th inst., ALEXANDER KELLAR, President, in the chair.

Cecil H. Murrell, C. P. Lee, W. Morgan, and W. Foster were elected ordinary members. The members, by the kind permission of the Misses Rous, visited Court-y-Ralla recently, and the results—some charming pictures of this delightful locality—were duly exhibited and compared.

It has been decided to hold an exhibition, in the autumn, of "Photography and Photographic Apparatus," open to the United Kingdom, at which medals and certificates will be awarded in amateur and professional classes. Most encouraging promises of support have been offered.

**EDINBURGH PHOTOGRAPHIC SOCIETY.**

THE seventh ordinary meeting of the current session was held on the evening of the 2nd May, the PRESIDENT occupying the chair. Three gentlemen were elected as ordinary members.

A. N. M'ALPINE gave a lecture on photo-micrography, which contained much that was interesting to the large number of members present. The lecturer advanced and recommended a style of taking negatives of microscopic objects different from that in common use, and to illustrate his meaning exhibited the apparatus he employed for the purpose, which consisted of a microscope placed vertically, and over which was fixed a bellows camera which could be expanded or contracted as required, and kept in position by side screws working on uprights. No focussing screen is used, and the lecturer maintained that in addition to the ease with which negatives could be made, the results were equal to those obtained by the common method. Mr. M'Alpine explained that he had only recently taken to the making of micro-negatives, and while he handed round examples of what he had done, he did so more to show how easy the work was than for any excellence it possessed.

T. BRENNER followed with further explanation of the apparatus made use of, and exhibited an arrangement of a kind similar to that shown by Mr. M'Alpine, though of a less finished construction.

J. FORGAN also brought forward a microscope mounted on an adjustable stand with the object of making negatives of micro-slides. He gave some reasons for holding the opinion that the usual method of photographing microscopic objects was to be preferred to that advocated by Mr. M'Alpine, and quoted some authorities in support of his remarks. At the same time he thought the Society greatly indebted to the lecturer for his able

treatment of the general subject, which was one of ever growing importance, and which the Edinburgh Society ought not to be behind in making acquaintance with.

JAMES M'GLASHAN read a short paper upon a fault in stripping films, at the same time exhibiting an example of what he complained.

THE SECRETARY exhibited a number of negatives taken on Mawson and Swan's photo-mechanical plates which had been kindly sent by that firm. The clearness of the shadows and the density of the high lights were extraordinary, and amply demonstrated that gelatine films under favourable conditions were perfectly suited for mechanical work.

**LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.**

A MEETING was held in the Mayor's Parlor, Old Town Hall, on May 9 (C. UNDERWOOD in the chair), when one member was elected, and one member proposed for ballot at next meeting.

Mr. TUCKER announced that the members of the Loughborough Photographic Society intended visiting Wingfield Manor, and the members of the Leicester Photographic Society were invited to join them; an invitation it was decided to accept.

The President (Geo. BANKART) then gave his promised demonstration on Development of alpha Paper. Having some already exposed prints, he proceeded to develop them by ferrous oxalate, explaining, as he progressed, the different dodges he had found useful, and which had assisted him at arriving at good results. The after process of fixing and toning were gone through and explained, and the whole was satisfactorily accomplished, and found considerable favour with the members present.

Mr. WILKINSON then demonstrated the process of stripping a negative for the purpose of reversing, which proved a very useful experience to the members.

This being the last evening meeting for the session, the meeting was adjourned until the second Wednesday in October.

**BIRKENHEAD PHOTOGRAPHIC ASSOCIATION.**

THE ordinary monthly meeting was held on the 10th inst., PAUL LANGE in the chair.

H. D. Houghton was elected a member.

It having been decided at the last meeting to hold a photographic survey of the Hundred of Wirral, considerable time was devoted to the consideration of carrying out the scheme successfully. John Hargreaves, a member of the Royal Historical Society, had prepared specially for the occasion lithographed maps of the district, marked off in as equally as possible fifteen different sections, showing everything of note in each. The names of some thirty members having been handed in to the Secretary, the various sections were balloted for, two operators being allocated to each. Mr. Hargreaves, unavoidably absent, sent a long letter stimulating the members to enter on the work enthusiastically, and pointing out the advantages that would accrue to the Association when it was completed and made public.

Mr. LANGE exhibited his detective camera, and explained the working of its shutter, which is a modification of Kershaw, having a double roll of cloth with an aperture in each, which, moving in opposite directions, gives greatly increased rapidity. He exhibited some examples of work done with it at a local race meeting, where the horses, in jumping, were represented in mid air, and perfectly sharp all over.

THE SECRETARY exhibited and explained James's magnesium flash lamp.

It was decided to hold the Association's competition for the best set, limited to six exposures and untouched negatives, on Saturday, June 9, the locality selected being from Bromborough Station to Bebington Village.

**SHEFFIELD CAMERA CLUB.**

A GENERAL MEETING of the members of this new Association was held on Wednesday evening, at No. 8, Fitzalan Square. Dr. MORTON presided, and there was a good attendance.

The following gentlemen were unanimously elected as officers:—

*President*—Dr. Morton.

*Vice-Presidents*—B. W. Winder and G. E. Maleham.

*Treasurer*—W. Gilley. *Hon. Secretary*—J. O. Arnold.

*Committee*—C. F. Coombe, G. T. W. Newsholme, E. Howarth, C. Hardy, Charles Yeoman, and J. H. Rawson.

Arrangements were then made as to details regarding the Club, which has excellent prospects of success.



## Talk in the Studio.

**ORANGE GLASS SUBSTITUTE.**—Mr. J. B. Huffman, of Chillicothe, Mo., sends the following substitute for orange glass for dark-room work; it is simple and easily tried:—

Asphaltum ... .. 3 parts

Spirits of turpentine ... .. 1 part

Coating the glass 1, 2, 3, or 4 times, as desired, same as flowing collodion.—*St. Louis Photographer.*

**CRYSTAL PALACE PHOTOGRAPHIC EXHIBITION.**—It has been decided to hold another Photographic Exhibition at the Crystal Palace during the spring of 1889.

**PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.**—The usual monthly Technical Meeting will take place on Tuesday next, May 22nd, at 8 p.m. Open at seven for journals and conversation.

**INTERFERING WITH A PHOTOGRAPHIC BUSINESS; EXTRAORDINARY CASE.**—On Wednesday last, *Tod-Heatley v. Benham* came on for hearing in the Court of Chancery, before Justice Kekewich. The landlord of 7 and 8, Gloucester Terrace, Brompton Road, and Elliott and Fry, photographers, moved to restrain Dr. Benham, the projector of the Queen's Jubilee Hospital, from using No. 6, Gloucester Terrace, in such a way as to cause a nuisance. The case for the plaintiff was that the business of the hospital came within the scope of the prohibition in the lease, which forbade the carrying on of any noisome, obnoxious, or offensive trade. Mr. Fry, in the witness-box, said that the hospital injured his business as a photographer. Persons had come to his house, as he thought, to be photographed, and had taken a seat and inquired for the doctor. Moreover, parents objected to bringing young girls near a place where repulsive diseases were treated. After the arguments of Counsel, his Lordship said he thought the hospital introduced the danger of infection into the neighbourhood, and he must therefore grant an injunction. The operation of the injunction would be suspended for six months, in order that the hospital might have time to arrange its affairs. The judge seems to have decided that the profession of a medical man is a "noisome, obnoxious, or offensive trade." Perhaps some day a photographic business will be similarly condemned at the suit of some neighbour whose customers object to the class of people visiting the establishment.

**WHEN WILL FRAUDULENT LENS VENDORS BE PROSECUTED?**—This question may now seriously be asked, considering the following record of a conviction in a case quite parallel with the existing system of selling lenses under false names. The *Pall Mall Gazette* of Wednesday evening last says:—"At Sheffield to-day an important case under the Merchandise Marks Act came before the stipendiary. The information was laid by the president of the Sheffield Federated Trades Council against Messrs. John Baker and Co., cutlery manufacturers, for having in their possession a card of German nail scissors on which were the words John Baker and Sons, manufacturers, Sheffield. The stipendiary inflicted a fine of £5 and costs." Perhaps, the opticians and reputable dealers could form a Federated Trade Council to deal with the lens question.

**NORTH LONDON PHOTOGRAPHIC SOCIETY.**—There will be an excursion on Whit Monday to Taplow, proceeding along the river to Maidenhead. Trains leave Paddington, Bishop's Road, at 10.6. Rendezvous at Bear Hotel, Maidenhead, at 6 o'clock p.m.

**CITY AND GUILDS OF LONDON INSTITUTE.**—The annual Students' Conversazione will be held at the Technical College, Finsbury, on Friday, May 25th, 1888, commencing at 7 p.m., when a lecture will be delivered by Professor S. P. Thompson, on "Polarization of Light," also a lecture will be delivered by Professor J. Perry, on "Magnifying Springs." Tickets may be obtained from the office of the College, or from W. D. Cuning, P. V. McMahon, Hon. Sec. Prices: Ladies, 2s. 6d.; Gentlemen's, 3s. 6d.; double, 5s.

**DERBY PHOTOGRAPHIC SOCIETY.**—The ramble on Saturday last was at Repton, and was attended by a large number of the members. About 120 plates were exposed, and some very good negatives obtained.

**THE PHOTOGRAPHIC EXHIBITION AT BRADFORD.**—The *Bradford Observer* gives the following particulars and list of prizes taken:—"Class 1.—Landscape (full plate and upwards): 1st prize, Mr. H. Forsyth; 2nd prize, Mr. W. H. Scott; highly commended, Mr. D. G. Law and Mr. I. Sonnenthal. Class 2.—Landscape (half plate and under full plate): 1st prize, Mr. W. H.

Scott; 2nd prize, Mr. M. B. Wallace. The latter gentleman was also highly commended for a number of views. Class 3.—No exhibit. Class 4.—Instantaneous: 1st prize, Mr. M. B. Wallace; 2nd prize, Mr. W. S. Smith; highly commended, Mr. I. Sonnenthal. Class 5.—Interiors: 1st prize, Mr. H. Scott; 2nd prize, the Rev. T. Melodey, M.A. Class 6.—Architectural Subjects: 1st prize, Mr. W. H. Scott; 2nd prize, Mr. H. Forsyth. Class 7.—Portraits: No prizes; highly commended, Mr. George Roberts. Class 8.—Genre pictures: No award. Class 9.—Enlargement: 1st prize, Mr. W. H. Scott; highly commended, Mr. W. H. Scott and Mr. George Roberts. Class 10: Mr. H. Forsyth receives a silver medal for sixty collodio-albumen transparencies, exhibited in stereoscope. Class 11.—Lantern Slides: 1st prize, Mr. W. S. Smith; 2nd prize, Mr. M. B. Wallace (not exhibited to the public). In addition to the above prizes, a silver medal was offered by the editor of the *Amateur Photographer* for the three best pictures in the exhibition taken by one competitor. The medal was finally awarded to Mr. H. Forsyth for Nos. 2, 6, and 112, "A View in Hyde Park," "Haddon Hall," and "Ball Room, Haddon Hall."

**PHOTOGRAPHIC CLUB.**—The subject for discussion on May 23rd will be "The Hydroquinone Developer." Bank Holiday outing at Oxford; trains from Victoria at 10.40, London Bridge at 10.44. Lunch at Lympsfeld.

## To Correspondents.

**FRENCH TYRO.**—1. Destroy the gelatine by the addition of about its own bulk of sulphuric acid, then treat by usual methods. 2. Probably you use far too much of the colouring material.

**HAINSWORTH.**—Perhaps you can get them from Paris, through Marion and Co., of 22, Soho Square.

**J. WITHAM.**—The trouble arises from the use of certain qualities of gelatine in making the tissue, and is mitigated by quick development and leaving only a short time in the cold water. In order to work to the former condition you must very carefully adjust the exposure. Keeping the tissue a few days after sensitizing is sometimes an advantage, and you had better use a stronger bath. Try to find and to eliminate the condition which makes your tissue become insoluble so soon. The following are common causes:—Bath too acid, and requires tempering with ammonia; fumes of acid, or gas, or leaky drains in drying rooms; the use of an old sensitising bath; putting away the tissue damp. Write again if needful.

**L. Y. X.**—Brush over with a warm solution of one part of Coignet's gold label gelatine in fifteen of water.

**PAX.**—Make a cast in plaster from the gelatine, and use this plaster mould in making a stereotyp. Stereotyping, however, by the plaster process is a little troublesome, but you will find instructions in a handbook of stereotyping published at about 5s., by Wyman, of Great Queen Street. Perhaps if you take the mould to Sbarrow and Anderson, 16, West Street, Soho, London, they will cast you the plate: this being one of the few firms working the plaster process.

**PLATINOTYPE.**—The method you mention is, as far as we know, not included in any of the Patents; but your best way will be to obtain the Specifications and carefully read them for yourself.

**W. LAWLEY.**—We are much obliged to you for giving us an opportunity of seeing the apparatus, which presents some excellent characteristics, and involves a principle which, as far as we know, was first put into practice by W. Spink, of Brighton; and one substantial advantage of his system is the absence of india-rubber fittings inside, the decay of these sometimes giving unexpected trouble.

**A. RICHARD.**—Perhaps the best way will be for you to advertise for someone to give you instruction. There are many capable persons among our readers, and probably some with leisure and inclination to teach.

**WALTER CAMERON.**—The pyroxyline has probably so deteriorated by age as to have become quite useless. Obtain a fresh sample.

**F. B.**—We are under the impression that the address is, care of Mann and Fursmann, Bury Street, Bloomsbury, London, W.C.

**WM. WASHAM.**—The arrangement was made for the designer by Wratten and Wainwright, photographic material dealers, of Great Queen Street, London, W.C., and we think that they are prepared to supply the public.

**MORGAN and KIDD.**—Your letter, which bears the Richmond post mark of two days later than the written date, is too late for this week, but shall appear in our next.

**J. S.**—1. There is no patent in connection with the name, but it may be registered; the process is, as far as we can judge, quite an ordinary one. 2. The first or the third.

**W. EXCELL.**—1. We compliment you on your success. 2. The number should be 1,200. 3. Write to Mr. Husband.



# THE PHOTOGRAPHIC NEWS.



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## OFFENSIVE TRADES.

TOD-HEATLY AND ELLIOTT AND FRY v. BENHAM.

THE development of civilisation brings with it many complicated and troublesome difficulties and questions, one of which is the increasing difficulty of avoiding offence or injury to one's neighbours, and the corresponding (or consequent) necessity for circumspection and care in the conduct of our mutual affairs and businesses.

How so to live as to get a livelihood without treading (metaphorically) on some one's toes, in the great and seething crowd of present-day life, is a problem daily demanding solution. The matter must be studied on both sides of the question. On the one hand, we must avoid doing anything which may prejudice, injure, or even annoy or offend our neighbour; and, on the other hand, the neighbour must not be too punctilious and sensitive—too ready to make complaint and take offence. In a crowd there will be jostling.

Photography is a calling conducted under difficulties, some of which, indeed, beset other businesses; but in England pre-eminently it has one foe—the weather; and especially after weeks of rain, or fog, or a long winter, the photographer is eager to make the most of his opportunity, and apt to be irritable and resentful of anything which may militate against the full advantage he would obtain from the renewal or return of favourable conditions.

The fact of our calling not involving the supply of a necessary of life, but ministering almost entirely to pleasure merely, makes us naturally apprehensive of any surroundings or concomitants likely to check or interfere with the flow of customers, sitters, or clients, for by these various names are the patrons of the studio distinguished.

(What an odd thing it is, by the way, that these words, “patron and client,” should bear such a different—in fact, almost an opposite—signification to that originally borne. The client was formerly dependant on his patron, and the patron the protector of the client; now-a-days the client is the patron.)

Among the objects that impede the prosperity of the photographer, and militate against or detract from the attractiveness of his establishment, and may, in fact, keep people away from the door, must be reckoned a “noisome, noxious, or offensive” trade or business.

Before, however, initiating litigation for the purpose of putting a stop to such an interference with our rights as this may create, and as a caution not to be too sensitive on the point, or hasty in seeking a remedy, let us see what is the position of the matter before the law.

A man may, without being liable to an action, exercise a lawful trade—as that of a butcher, brewer, or the like—notwithstanding it is carried on so near the house of another as to be an annoyance to him, in rendering his occupation less pleasant, agreeable, or profitable, provided the trade

is so conducted that it does not occasion a nuisance in law.

There is, however, a distinction in this respect between a trade that injuriously affects property, and one that causes only a certain amount of personal discomfort.

A leading case on the subject, the verdict of a jury for the plaintiff having been confirmed by the Court of Queen's Bench, the Exchequer Chamber, and the House of Lords, is that of *Tipping v. St. Helen's Smelting Company*. This was an action brought by the plaintiff, a landed proprietor, to recover damages from the defendants, who erected and used certain smelting works upon land near, and caused large quantities of noxious gases, vapours, and other noxious matter to issue from the works, and diffuse themselves over the land of the plaintiff, whereby the vegetation was injured, the cattle rendered unhealthy, and the plaintiff prevented from having so beneficial a use of his property as he would otherwise have enjoyed.

It will be observed that the obnoxious works in this case were erected in a part of the country (Lancashire) where such works would, if anywhere, be tolerated, the property being largely composed of mineral manufactures.

The Lord Chancellor said, in giving judgement, “In matters of this description it appears to me that it is a very desirable thing to mark the difference between an action brought for a nuisance upon the ground that the alleged nuisance produces material injury to the property, and an action brought for a nuisance on the ground that the thing alleged to be a nuisance is productive of sensible personal discomfort.”

This case was decided in 1865, and from that time to the present there has been a constant stream of litigation on the subject.

This sometimes takes the form of an action for damages as in the above case, or an application for an injunction, or both, may be claimed in the same action.

The latest case decided, and one likely to interest photographers, is *Tod-Heatly and Elliott and Fry v. Benham*. This case, referred to last week in the *PHOTOGRAPHIC NEWS*, was an action brought for an injunction to restrain the proprietor of the Jubilee Hospital from carrying on the hospital. The ground taken by Messrs. Elliott and Fry was, that the hospital being for the treatment of diseases of the throat, eye, skin, &c., persons were deterred from frequenting the studio (which adjoined) by the contiguity of the hospital, and the visits of patients affected with offensive, and it might be contagious, diseases. Judgment was given for the plaintiffs. The case was not decided, however, on the ground of Messrs. Elliot and Fry's specific complaint, but mainly on the covenants in the lease. From a letter in the *Standard* of May 19, it appears there is to be an appeal, and the ultimate decision may be the other way. The Judge said the case was on the border



line, and he would have called for a reply had he not been fettered by authority. The same Judge, in fact, recently decided that the business of a butcher, though it comprised a slaughter-house, was not a noisome, noxious, and offensive trade or business. He went further: he decided that it was not a business which was one likely to "be, or grow to be, a nuisance or annoyance" to the owners or occupiers of contiguous property.

[This case came before him on the complaint of the ground landlord, who contended that the carrying on of this business was a breach of the covenants of the lease, and brought an action for ejectment, or, as it is now called, recovery of land, and injunction on the ground of said breach. The lease contained, as many do, covenants against offensive and noxious trades, enumerating some of them.]

In the case now under discussion, the Judge, as before observed, did not decide mainly in consequence of Messrs. Elliot and Fry's complaint as to their business, but on the principle laid down in *Bramwell v. Lang*, decided by the late Master of the Rolls.

Mr. Justice Kekewich said, "In *Bramwell v. Lang* the covenant was almost in the same language" (the usual covenant against noxious trades, &c., as in the butcher's case), "and in substance was indistinguishable. The late Master of the Rolls in that case granted an injunction, one of the grounds of his decision being that a hospital was a business. He went further, for he stated his own views in very plain terms when he said, 'It is well known that there are some throat diseases which are contagious, and, moreover, it is very possible that a patient in his first visit to a hospital might be found to be suffering from some disease of an infectious or contagious nature, and not from an ordinary throat or chest disease; and he accordingly held that on the evidence it was conclusive that persons in the neighbourhood had suffered annoyance, and that the possible danger from infection was a matter of which they had a right to complain. The evidence on these heads was quite as strong in this case, which was a case on a very similar covenant.'"

The right to a remedy, especially if not sought by the landlord, depends on the degree of annoyance, nuisance, or damage.

#### PLATINUM PRINTING WITHOUT DEVELOPMENT.

WHETHER as a substitute for the long-established mode of printing in warm tones on albumen paper, as appears to be anticipated by some, or as a distinct variety claiming and occupying an increasing field of its own, there seems to be no room to doubt that photographs of a nearly pure black engraving-like tone, and on paper without the gloss to which we have become so much accustomed, are destined to occupy a prominent position, not only as objects for exhibition in the galleries, but as commercial productions.

Evidence of the growing taste for pictures of this character is not far to seek, and, indeed, appreciation of really good work of the kind has not been wanting at any period of photographic history. From thirty to forty years since, Hennah and Kent, of Brighton—a firm which has, we believe, for many years ceased to exist—earned a wide reputation and commanded an extensive business by the high-class character of the portraits which they produced in black and white tones upon a matt surface paper. Other photographers produced pictures somewhat similar in character, but as the blacks in salted paper were generally deficient in depth and richness, a considerable amount of work, of a more or less artistic character, was commonly placed upon the photograph before it was presented to the public. This proceeding necessarily enhanced the cost, and rendered the faithfulness of the photography open to question. In Hennah's process the paper, when printing, contained some

gold as well as silver, and whether due to this circumstance or not, the prints were sufficiently rich to require but a moderate amount of artistic labour to finish them.

The introduction of the Platinotype process started a new interest in black tones and matt surface, and the excellent work in this direction shown by many exhibitors for some years has helped to foster a taste for productions of this character, which have the additional advantage of undoubted permanency. More recently, developed prints on bromide of silver paper have achieved some popularity, and the results of this method and of the platinotype are sometimes almost identical to the eye, although the claims of silver prints to be regarded as permanent may fairly be considered as open to question. Prints obtained by development on bromide paper may also be converted into platinum prints by substitution. Details of the process will be found in the French Correspondence contributed by Leon Vidal, and published in our columns a few months since. An evidence, however, of the growing popularity of pictures having the engraving-like appearance to which we have referred, is the increasing number of specimens (whether platinum prints or developed bromide ones, it is impossible to tell by mere inspection) which are placed on view in the show-cases and windows of photographers of high standing.

The introduction of Pizzighelli's platinum printing process without development—details of which we published in our columns last autumn, p. 724 and 729—is, we believe, destined to mark an era in the production of matt surface printing. Some specimens shown by J. B. B. Wellington at the last technical meeting of the Photographic Society of Great Britain—to the report of which, on another page, we refer our readers—struck us as being in no way inferior in brightness and richness to those which he has previously exhibited made by the development process. The great advantage, however, of Pizzighelli's method is its simplicity. The print is made in the printing press in the same way as an ordinary silver print to just the depth required, and there is no development. Perhaps the reason why Pizzighelli's process was not more largely adopted in this country immediately on its publication was, that there seemed to be a difficulty in preparing the sodium ferric oxalate solution, which is one of the essentials of the process. This difficulty, however, is now removed, as will be seen by the report to which we have referred. This chemical is now an article of commerce, and at a price which need not create any difficulty. The preparation of the paper, Wellington described as being very simple and easy, and we look forward to seeing the process as widely extended as its permanency and beauty of result, and unrestricted publication by its author (Capt. Pizzighelli) entitle it to be.

#### LAW FOR PHOTOGRAPHERS.

BY S. J. DEBENHAM, SOLICITOR.

##### CHAPTER I. (Continued).

It is a common error to suppose that any agreement is sufficiently stamped with a sixpenny stamp. On the contrary, it must, if an agreement for tenancy, be stamped as a lease. In short, it is a lease, *i.e.* a demise; though this term is not generally applied where the period is for less than seven years.

A tenancy limited to three years may be created by verbal agreement only; but this, of course, is not desirable. Anything beyond this must be in writing and under seal. A tenancy from year to year is a term certain for twelve months from the date of its commencement, and can only be determined by six months' notice to quit, which must expire on the anniversary of the commencement of the tenancy, and at the end of each year, if not terminated by the proper notice, another twelvemonth is added to the term. This tenancy arises by implication of law, where, *without any agreement for letting*, there has been occupation and payment of rent.



It is another frequent error to suppose that the landlord is in general, in the absence of stipulations on the point, bound to keep the premises in habitable repair. On the contrary, the obligation is on the tenant to keep the premises wind and water-tight, and to do fair and tenantable repairs; but he is not bound to replace fixtures worn out by time, or to remedy the mere wear and tear of the premises, or to do substantial and lasting repairs. He is bound to pay the rent during his term, notwithstanding the premises are burnt down; and an agreement should always provide against this liability. The tenant may also himself insure against fire.

The rule of law is that the occupier, and not the landlord, is *prima facie* liable for damages resulting from a nuisance arising upon the premises, or for injury to other persons or contiguous property from the ruinous or dangerous condition of the premises. An open or badly constructed or worn-out cellar flap, or dangerously projecting sun-blind, are such nuisances.

#### CHAPTER II.—GLASS-HOUSES AND LIGHTS.

In many cases it will happen that on taking premises it is found necessary to alter, or perhaps to erect, a glass-house or studio. This is sometimes built by the landlord, and an additional rental charged. If not, it is desirable to know whether, in the event of removal, these articles are the property of the tenant or the landlord. Formerly, a chattel affixed to or planted in the soil was thereby made part of, and thereby belonged to, the freehold; but a chain of authorities has settled that chattels may be annexed to the freehold, and yet remain as such chattels after they are annexed as before, and this is now the rule as to trade fixtures in general. In connection with this point it should be noticed that articles which are not actually fixtures are removable at all times before and at the determination of the tenancy.

In considering as to the removal of trade fixtures, the question is whether their removal is in accordance with any prevailing practice, is possible without injury to the estate, and whether they were in themselves of a perfect chattel nature before they were put up—in other words, whether they may be removed without being entirely demolished or losing their essential character or value. If they fulfil these conditions, it is immaterial that for the purposes of removal they have to be taken to pieces.

It does not appear to have been yet specifically decided whether a photographic glasshouse built on and attached to the premises in the ordinary way is removable by the tenant. We conclude that it is, following the general rule as to trade fixtures. Thus a baker's furnace, a dyer's vats, a soap boiler's apparatus, a colliery steam engine, a brewer's coppers are removable. The leading work on landlord and tenant (Woodfall) sums up the question thus:—"The distinction is between buildings of a permanent nature, and machinery and fixtures erected for the purposes of trade, the latter being removable, the former not." As between the photographer and his landlord, the matter may be, should be, settled by agreement in the first instance. Questions will, however, still remain dependent upon the character of the chattel, whether it be distrainable for rent due to superior landlord, &c.

If, as I have supposed, the tenant himself proposes to erect his glass-house, he must remember to observe the conditions of the Building Acts. In London he must obtain the sanction of the Metropolitan Board of Works. His plans will have to be deposited and approved by the district surveyor in the manner prescribed by the Acts.

#### LIGHT.

The breath of life to a photographer is the light of the sky, and I must not quit the subject of business premises without saying something on this matter.

Light and air are in legal language called easements, that is, accessories which do not actually belong to or form part of property conveyed, but which are essential to its due enjoyment. Many may suppose that when the

studio or glass-room is built, the matter is settled, and that, having obtained a good light, you are entitled to the enjoyment and use of it free from interruption or obstruction. This is an error, inasmuch as the absolute right to enjoyment can only be acquired by its use.

A light the right to which has been thus obtained is called "ancient." The right to ancient light—that is, such as cannot be darkened or obstructed without subjecting the aggressor to an action at law—is acquired by use for twenty years. The ground upon which this privilege arises from user (as it is called) is this, that from the fact of uninterrupted usage, a grant or licence is presumed to have been originally given. Twenty years' uninterrupted enjoyment of windows looking upon the land of another is sufficient ground for presuming a grant or licence to open the windows, in the absence of evidence to the contrary; and, as this will be seen, this is confirmed by Act of Parliament.

The Act of Parliament regulating, or I may almost say governing, this subject is the 2 and 3 Will. IV., c. 71, commonly called the Prescription Act, which is entitled "An Act for Shortening the Time of Prescription in Certain Cases."

S. 3 of this Act is as follows:—"And be it further enacted, that when the access and use of light to and for any dwelling house, workshop, or other building shall have been actually enjoyed therewith for the full period of twenty years without interruption, the right thereto shall be deemed absolute and indefeasible, any local usage or custom to the contrary notwithstanding, unless it shall appear that the same was enjoyed by some consent or agreement expressly made or given for that purpose by deed or writing."

It is remarked in the leading work on "Easements" (Gale) that no provision appears to be made for the circumstance of the premises upon which the restriction is to be imposed having been during the whole or part of the time in possession of a tenant—for the ignorance or acquiescence of the landlord, or even for cases in which it may have been absolutely impossible for him to have interfered at any time during the twenty years.

But I submit this criticism is somewhat pointless. In the first place, most premises are in the occupation of a tenant, therefore to have excluded such would have been irrational; secondly, the section is intended for the public benefit.

If you do erect your own studio, you must therefore take care that you do it in such a situation that the light cannot be obstructed or darkened by an owner of adjoining property, who may be desirous of building or extending an already existing building in a manner which would interfere with you. If, however, you take or buy premises which possess this right, and your "ancient lights" be obstructed, you have your remedy by action at law or in equity (Chancery). But you may have to wait until the trial before the remedy is effectual, as this depends on the amount of the damage you suffer. In general, however, substantial damage will command the peremptory interference of the Court, which will grant an injunction on motion at an early stage of the proceedings.

One or two cases decided by the Courts of Law may show the principles involved in this matter, and I therefore append them.

1. A building containing ancient lights was pulled down and replaced by another, in which the point was set back, and a dormer window converted into a skylight. Held, that the right to the access of light was not lost; but any substantial alteration in the plane of the windows destroys the right (Jessel, M. R.). But Lord Justice Fry slightly modified this doctrine, saying that the right remained where any portion of the light which would have passed through the old windows passes also through the new.

2. An ancient light of the plaintiff, a sculptor, had a north aspect in a street 31 ft. wide. Defendant's buildings on the opposite side of the street were, as to part, exactly



31ft. high; and, as to the other part, a little less than that height. They claimed to have a statutory right to raise their buildings to a height which would subtend an angle of 45° measured from a base-line level with the centre of the plaintiff's light. Held, that the statutory regulations as to the height of buildings in streets is not to be taken as limiting the right by prescription to ancient lights, but that such right depends upon the degree and amount of obstruction in each particular case.

3. In action for the obstruction of ancient lights, the judge directed jury that they were to consider whether there had been a sensible diminution of light so as to make the plaintiff's premises less available for the purpose of occupation or business to which they were then, or might thereafter be made, applicable; and that the damages were to be estimated according to the diminution of value of the premises for such purposes. Held, a right direction on the ground that the purposes for which the premises had actually been used while the light had been enjoyed, were not the proper measure of the light.

4. In order to acquire an absolute and indefeasible right to light under s. 3. of the Prescription Act, it must be shown not only that there has been uninterrupted access of light to the building in respect of which the easement is claimed, but also that the light has reached the building by one and the same channel for the statutory period. *Harris v. De Pinna*, 33 Ch. D. 238. This case also decided that the structure in question was not a building at all within the meaning of the Act.

The current of decision is rather in favour of a liberal construction of the statute, tending to facilitate and support the use of light.

#### NOTES FROM NEW YORK.

AN AMERICAN'S TRIP THROUGH SWITZERLAND AS ILLUSTRATED AT A LANTERN EXHIBITION BEFORE THE NEW YORK AMATEUR PHOTOGRAPHIC SOCIETY.—THE BOSTON EXHIBITION.

"A Trip through Switzerland," explained by Prof. D. L. Elmendorf, of the New York Deaf and Dumb Institute, was the subject of the lantern entertainment given before the Society on the evening of April 25th, under the management of the new Lantern Slide Committee, and it proved to be very enjoyable to the crowded audience which filled the limited area of the Society's meeting room.

Leaving New York for Havre, we see an excellent view of the friends of the passengers on the dock shaking their handkerchiefs and "good byes." This was explained as a most difficult picture, since it was taken directly against the sunlight. Some pictures on board the steamer, including the lady who held a book before her face, but who lowered it to hear the good story the Professor was telling the captain, when she was subsequently unconsciously caught in the picture, which also included an excellent likeness of the genial captain, and a view of the officers on deck taking their daily observations, next followed, and were all excellent. One or two views of ships in full sail in mid ocean, and a deserted wreck, were much admired.

Arriving at Havre, we see the splendid docks and harbour, with the lighthouses, also the peculiar construction of lines of piling projecting into the sea to break the force of the waves. With one or two views in Rouen, the journey was continued to the western end of Lake Geneva. Here the special kind of boats used were exhibited, the churches, and the architecture. A trip around the lake was made, and included some magnificent views. Prof. Elmendorf considered it the most beautiful place in the world.

From the lake, the Rhone valley was followed, and included interesting glimpses of Swiss life. We saw pictures of the best ladies in town, wearing odd looking beaver hats; a group of Swiss guides, having their favourite long pipes in their mouths; and a group of Swiss children caught when they did not know it. Ascending the valley, the

noted Rhone glacier is reached. Here we observe the little stream of water issuing from the base of the mammoth glacier which forms the constant supply to the river Rhone.

Excellent views of the ascent of the glacier, and from the top of it in different directions, next followed.

The treacherous nature of the snow in covering up great crevices through which guides sometimes fell to their death was explained, and in descending the glacier on a sort of toboggan slide the speed attained was stated as something terrific. A view showing the party ready to start on the downward trip was capitally done.

Then followed views along the Furca Pass to Andermatt; here the St. Gothard Pass was reached, and views showing the entrance to the great tunnel were exhibited. Passing through the St. Gothard Pass we come to Atdorf, near Lake Lucerne, the place where William Tell is said to have shot the famous apple; splendid pictures of the Tower and of Tell's statue were shown.

Proceeding from Atdorf we pass through Klausen Pass to Linthal, thence over into Tyrol, Austria, a perfect heaven for the camera, as the Professor expresses it; mountains, valleys, rivers, churches, and curious people all form a great variety for the amateur to select from. Here we go through wonderful ranges of mountains, passing up the Kauserthal to the Oetzthal range, over the Gepatch, Kesselwand, and Hinterer's glaciers into Sterzing.

Proceeding thence by train to Salzburg, we catch pretty views on the way, and take a walk to Konigs See. Passing by Munich, we go at once to Lindsu, on Lake Constance. Here we have an excellent view of the steamer leaving the town. The Austrian Custom House officials, Professor Elmendorf said, were the most stupid block-heads he had come across. They insisted on opening everything, but when told that it was nothing but glass they accepted the statement; so sensitive plates in that country are considered as so much glass, which must be weighed and paid for at so much per pound. He wished there might be some dynamite box go off among them sometime, that they might be scared. In Germany, and France, and Switzerland, it was sufficient to show that you were an amateur photographer to successfully get along.

Crossing Lake Constance by boat, we take the train to Zurich, on Lake Zurich, and a city noted for its fine buildings and beautiful surroundings. A fine view of the Grossmunster or principal cathedral was shown; also of the front of the main railroad station, of the first-class passenger coaches and locomotives. The superintendent sent for a new locomotive, three miles away, to come up and be photographed. The trains travel through a city and suburbs at snail pace. Should any one jump on, they stand a chance of being arrested and fined.

A peculiar view was taken from the rear end of a train looking forwards as it was going round the curve. The average speed is twenty-five miles an hour.

From Zurich we pass on to Zug on Lake Zug, where Professor Elmendorf arrived just after the terrible avalanche of 1887, which carried down buildings and people into the Lake in a second, killing many hundreds. His splendid views of the debris and results of the disaster told of the appalling effect it must have had. He related one or two pathetic incidents about it. Unfortunately, his exposures on the famous Rigi Mountains, at the southern end of the lake, were spoiled. But other glimpses of the fine scenery around the lake were shown.

Going now to Lake Lucerne and Lucerne, we reach a most magnificent country abounding in beautiful scenery and fine hotels. Several views of the noted Lion carved out of the solid rock were shown. Views of the Swiss Post Office carts were also exhibited, and the fact that they will carry a trunk around by post packed with crockery, which is never broken, was explained. It was far more perfect than anything in America; you simply put a postage stamp on the trunk, and it would go early and safely to the desired destination.



From Lucerne the trip ended at Berne. Here was shown a superb panoramic view of the whole city taken from one of the surrounding peaks. Excellent views of the famous peaks, over twelve thousand feet high, near the city—such as Jung Frau, Schreckhorn, and Wetterhorn—were shown, also a view of the celebrated high clock tower which stands in the centre of the city, and has a procession of bears come out and move around it when it strikes the hour. There were also pretty views of some of the avenues and the fine hotels. The view of the great Nydeck Bridge entering Berne, and said to be the largest in Switzerland, was very fine, and loudly applauded. The last slide shown was coloured with twenty-seven different colours; it represented a picture of a Roman tower near Berne looking against a setting sun. The effect on the screen was charming, and it formed a good ending for such a pleasant evening's entertainment.

In speaking of the trip (after the story was told and the lights turned up), Prof. Elmendorf remarked, in reply to questions, that he had three gross of four by five plates made for him specially by the Stanley Company, and out of the 274 shots he made, he secured 258 good negatives and slides. He did not develop any of the plates until he returned home, and then he used the Cooper soda and pyro developer, using twice the amount of pyro which is usually advised, since for slide negatives it was necessary to carry the development along pretty well to get density and contrast in the high lights, and depth and density in the shadows. He developed two at a time in one tray. All of the slides were made by contact on Carbutt's lantern slide plates, the time of exposure being, from one to three seconds, about a foot away from an ordinary gas flame, and were developed six or eight a time in the hydrochinon developer, as advised by Dr. Piffard, using it at its full strength, and taking out each plate as it appeared to have enough density. If the plate was over-exposed, the picture would have a brown black colour; if properly timed, it would be more black. The developer was much better than the ferrous oxalate for this purpose.

The following is the formula :—

Hydrochinon	...	...	...	15 grains
Sulphite soda	...	...	...	60 grains
Water	...	...	...	1 ounce

Soda solution :—

Carbonate of soda (crystals)	...	...	...	30 grains
Water	...	...	...	1 ounce

To form the developer, mix equal parts of each, and, after using, return to the bottle to use over again.

Prof. Elmendorf advised adding also a small quantity of a solution of bromide of potassium, which would correct over-exposures. He carried a light 4 by 5 novelette camera, seldom using a tripod, and used a battery of four or five lenses of different focal lengths for distant and near views. He believed in short exposures for interiors.

The slides were coloured by aniline dye colours, and he generally combined two complementary colours, one film over the other, to obtain a particular colour. The careful and perfect way in which the slides had been coloured attracted considerable notice, and showed that the Professor was an adept at it. A vote of thanks was accorded to the Professor for the entertainment. It is a long time since the Society has had such a thoroughly good exhibition, which it may be said was due largely to the efforts of the new lantern slide committee.

President Garfield announced before the exhibition commenced that the Society's lantern would be used, and that the lantern slide committee whom he had appointed consisted of the following members :—F. C. Beach, Chairman; Charles Simpson, Walter A. Singer, Clarence S. McKune, George Marshall Allen, and George Boynton.

Prof. Elmendorf explained the pictures in an easy, off-hand, entertaining way. Mr. Beach and Mr. Singer operated the lantern satisfactorily, and were assisted by

Mr. Simpson. A few minutes after ten the exhibition terminated.

The report from Boston is that a fine exhibition is promised; the entries number about 312 frames, about eighty less than the New York Exhibition of last year. There is also over a hundred lantern slides, and many transparencies and opals. Prof. H. S. Rowland (of Baltimore, Maryland), and Mr. Frank, Mr. Sutcliffe (of Whitby, England), contributed, so it is said, some of the finest specimens of astistic work. A lantern exhibition of short duration is to be given every evening; there is also to be published a catalogue, which will no doubt prove of considerable value. The exhibition will close on May 12th. The Boston Club has adopted a special classification of its own, which I am informed was not fully approved of by the other participating societies.

The New York Society is expecting to introduce, before long, into its dark-room, the incandescent electric light, and may possibly try a similar light in its optical lantern. The electricity is to be taken from street mains, so that all the trouble of experiment with battery electricity will be avoided. The exposure is to be but a trifle more than gas. Mr. Rockwood has recently taken 11 by 14 views of the congregation in the Rev. De Witt Talmage's large Brooklyn Tabernacle, by the magnesium flash light, which were pretty fair.

SULPHITE.

New York, May 2nd, 1888.

## BROMIDE PAPER FOR REPRODUCING MAPS, PLANS, ETC.

BY W. M. ASHMAN.

### FIRST ARTICLE.

WHEN a large number of copies of subjects more or less in black-and-white, like plans and some other drawings, are required, for military, commercial, or other purposes, there are few methods of reproduction from an original of greater service than the photo-lithographic or zincographic processes so fully described by Major-General Waterhouse in the pages of the PHOTOGRAPHIC NEWS, whether hand-colouring be applied afterwards or not. The results arrived at are in all respects equal to the designs from which they are taken, and either plates or stones once prepared for the work are capable of withstanding any reasonable amount of wear before the delicate surface from which impressions are made in printers' ink shows deterioration to any appreciable extent. Although it is now possible in some of the great centres of industry like London, New York, and some Continental cities, to get work of this kind done at remarkably short notice, and upon the whole, perhaps, with greater economy than one could prepare the printable clichés for themselves, yet there are occasional instances to be met with in business in which a reproduction of a design, map, plan, or other drawing, either of smaller or larger dimensions, may be required quickly, and where a good photographic positive in black-and-white will answer the purpose admirably. Under such circumstances, silver bromide paper is of the greatest possible use, since with really good negatives of the subject in hand, and a proper attention to details of exposure and development, with such modifications of formulæ as may by experience or experiment be deemed advisable, results of a very satisfactory character are without difficulty obtainable, and with a celerity which, to the uninitiated, may appear quite astonishing. Thus it is possible, as most photographers are aware, to produce a negative of a drawing, and, by means of rapid washing and drying, have it ready for printing in less than an hour. Expose bromide paper beneath it, develop, fix, wash, and dry the resulting print in a like period, although the short time which could, under such circumstances, be devoted to the process of washing would obviously be insufficient to eradicate the whole of the fixing agent left in the paper after fixation.

So much, then, for the rapidity of execution when the



exigencies of a case require it. And, it may be added, that as the exposure of the paper is only a question of seconds within a foot or eighteen inches distance of a gas flame (batswing burner), the rate at which duplicates could be produced is one governed principally by other considerations than that of exposure. In this respect platinotype printing is completely out-distanced, while the resulting prints on bromide paper are in every way as suitable when sufficient attention is paid to the details of fixing, washing, and finishing.

As work of the kind we have been considering is often asked for, and very possibly would be in much greater demand if the capabilities of the bromide process in this direction were more universally understood, the writer proposes to deal with the details of reproducing a subject of the kind referred to in a manner which he trusts will be sufficiently clear to the tyro without becoming tedious to others, who may probably employ the process already for the class of work named.

When about to copy a drawing by means of the camera, it is first of all necessary that the object, whatever it be, should lie flat upon a board or other surface, or if convenient, be stretched upon a frame, and the margins well secured thereto by means of drawing pins or tacks, and thereby reduce the chances of cockling to a minimum. If this precaution be unheeded, there is danger of inequality of lighting being discovered when the work is complete. At any rate, if not noticed in the early stages, it will eventually be a source of annoyance. Even illumination is a condition to be sought after, and a well-diffused light out of doors will, to those not in possession of a studio having a broad expanse of light, answer better than when light can only be admitted in limited quantity from an ordinary window or small studio lit from one side only. Under these two latter circumstances it may happen that when an otherwise correct exposure has been given, one side of the drawing is deficient in force.

Let us suppose this possible defect has been provided against, and that an equal distribution of light pervades the entire surface owing to the plan, drawing, or paper sketch being tightly fixed up in a well diffused light; the next consideration is that of lens and camera best suited for our purpose. These conditions are mainly perfect defining power, coupled with absolutely, or as near as can be, straight lines. For these reasons it is better to select an instrument embracing a fairly wide angle, and if of tolerable long focus, so much the better, so that the camera is not too close to the object, and thereby obstructing light. Rectilinear lenses of the rapid type issued by reputed makers, when stopped down to a working aperture of  $\frac{1}{16}$ , usually give perfect marginal sharpness on plates corresponding in linear measurement to that of the focal length of the lens. With a diaphragm of such small aperture, it is a difficult matter to be quite sure that the best focus has been selected; therefore, it is not advisable to insert the stop in the lens until after the proper focus has been adjusted. It is essential that the camera should be parallel to the object, properly centred and level, then the distance from the centre of the lens to the four corners of plan or other drawing to be copied ought to be equal. This condition may be ascertained by measurement, and a spirit level is a useful adjunct for determining when the position of the camera is level, for it is important for the camera to square with the drawing, in order that the lines when reproduced shall be true.

When satisfactorily adjusted, the focus may be arranged and a plate exposed. This, of course, must be regulated by the conditions of light, speed of plate, &c.; but in a good light, and with a lens such as that named, the subject being black and white, or very light tints, an exposure of thirty seconds at this season of the year will probably be sufficient for an ordinary plate of commercial manufacture. When the reduction in size is but slight, a few seconds longer may be required to secure a vigorous printing negative, and per contra, when reduction in size

is very considerable, an exposure of twenty seconds or even less may suffice. Only an approximate idea of what time is likely to be necessary can be given, but it will doubtless be of sufficient service as a guide to the inexperienced, in copying this class of subject, to prevent unnecessary waste of plates and valuable time.

The ordinary developer employed with the sample of plates used answers quite well, provided it does not contain an excessive proportion of alkali to pyrogallol, or ferrous sulphate to potassium oxalate. The writer gives preference to ammonia pyro development, using about half the proportion of alkali in the first place, and when detail is all visible add the remainder, and continue the process until sufficient density appears upon examination to have been gained to ensure the negative being a vigorous one when fixed. This latter process needs no comment, neither does that of washing, beyond mentioning that if the drying is to be accelerated by soaking the negative in methylated alcohol to extract water, much less washing will be needed. Producing the positives therefrom must form the subject of another article.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

EXPERIMENTS ON INTENSIFYING—PRINTING WITH ARISTOTYPE PAPER—COLLODIO-CHLORIDE TRANSFER PAPER—EDER'S NEW ORTHOCHROMATIC COLLODION EMULSION—MAGNESIUM FLASH LIGHT.

*New Experiments on Intensifying Negatives.*—In my previous letter I have already mentioned that Captain Himly, of Berlin, has introduced a new intensifier with salts of lead, which proves to be very useful, but the composition of which has not been published by the inventor. Such an intensifier being, however, a desideratum, some other investigators have recently made experiments in this direction, and I am glad to hear that one of these, E. Vogel, junr., the son of Professor H. W. Vogel, has obtained very satisfactory results. The intensifiers with uranium and salts of lead, which were very successfully employed in the wet collodion process, are offering great difficulties in the case of gelatine plates. Whilst acting only slowly on the film, they often stain the plates, and produce unequal density. According to Professor Eder, the reason lies in the fact that the gelatine film is hardened by the red prussiate of potash contained in bath intensifiers, so that the solutions are prevented from penetrating into the film. Anticipating this being the case, E. Vogel thought it a good plan to use substances by which the gelatine will be dissolved—as for instance the various acids, formic acid, acetic acid, citric acid, oxalic acid, &c.—and he soon found that a certain quantity of such an acid may indeed prevent the hardening of the gelatine film. So he obtained excellent results by adding glacial acetic acid to the well-known intensifiers with prussiate of potash. The effect, as he says, was a surprising one. The following intensifiers with acetic acid give within a few minutes an intensive colour, whilst at the same time the same intensifier without acetic acid proves to be almost entirely ineffective. E. Vogel applies the following mixtures:—

### I.—Selle's Uranium Intensifier.

Red prussiate of potash	1 : 100 water	50 c.c.
Uranium nitrate	1 : 100 water	50 c.c.
Glacial acetic acid	...	10 to 12 c.c.

The thoroughly washed negative is placed, wet or dry, in this solution until it has acquired the desired density, when it is washed out for ten to fifteen minutes. If the washing is prolonged too much, then the gained density will go back, which, however, is an advantage in the case of an over-intensified negative.

### II.—Eder's Lead Intensifier.

Nitrate of lead	...	4 grammes
Red prussiate of potash	...	6 "
Water	...	100 c.c.
Glacial acetic acid	...	10 to 12 "



In this bath the negatives acquire a whitish grey colour. To darken them, they are washed for a short time, and may then further be treated in different ways, according to the character of the negative. For negatives with half-tones it is recommended to colour the plates blue by immersing them into a bath consisting of one gramme of ferric chloride in 10 c.c. of water, and then to convert this blue colour into a yellowish brown one by application of diluted ammonia. To line negatives a very suitable colour may be imparted by use of permanganate of potassium or bichromate of potassium with ammonia, chloride of copper, &c. Permanganate of copper colours the negatives dark brown, bichromate of potassium with ammonia gives a yellow to reddish colour, chloride of copper a brownish-red one. For the sake of simplicity, however, the uranium intensifier will generally be preferred to the intensifier with salts of lead.

*Printing with Aristotype Paper.*—As to the nature and treatment of the so-called "Aristotype Paper," which is on a large scale manufactured by Dr. Liesegang, of Dusseldorf, elaborate explanations have already been given in the PHOTOGRAPHIC NEWS, and it will therefore be known to the most of your readers that this is a pure photographic paper, coated with a substratum of barytes, and afterwards with chloride of silver containing just sufficient gelatine to give to the paper the gloss of the best albumenized paper. Dr. Liesegang, the ardent scientist, has spared no pains and no money to render this wonderful paper as perfect as possible, and I strongly believe that it is destined eventually to supersede the albumenized paper, over which it has so many advantages. It prints quicker than albumen paper, and the fine details of the negative are most accurately reproduced upon it, for the reason that the sensitive film lies on the surface of the paper, and is prevented from sinking into it. Above all, it gives vigorous prints, even from weak negatives from which no satisfactory print can be obtained on any other paper. As this paper is said to be also extensively employed in England, it will perhaps be of interest to many of your readers to become acquainted with a new method of giving to the aristotype prints a highly glossy appearance, as it is employed by my friend, Eugen von Gothard, of Hérny. The prints, after being thoroughly washed, are dried, and the glass plates upon which the prints are to be squeegeed very carefully cleaned with Grune's polishing powder, and rubbed dry with Joseph paper. When the prints are quite dry, four to six of them are placed into water; then a glass plate is slightly moistened with a sponge, and the prints cautiously laid upon it, after having been one to two minutes in the water. When the glass plate is full, a parchment paper is placed over the whole, and the water pressed out with an india-rubber squeegee. It is well to dry the prints as quickly as possible, and as soon as they are dry—which will require about two hours—they must at once be stripped off. The prints will peel off the glass with the greatest ease, acquiring a highly glossy surface. If the prints are dried for a longer period than necessary, then the stripping becomes more difficult. By this method most beautiful prints can be produced on Liesegang's aristotype paper in the simplest manner.

*Collodio-Chloride Transfer Paper.*—There is another paper manufactured by Dr. Liesegang, which proves to be very useful in transferring prints to glass plates, or in reproducing negatives. It consists of a film of collodio-chloride upon gummed paper. The paper is exposed to light under a negative in the ordinary printing-frame till a very dark print is obtained. It is then laid flat, the printed side downward, upon a glass plate which has been moistened with cold water on its surface. With an india-rubber squeegee the print is then pressed into contact with the glass plate. After a minute or two, when it will be seen that the paper becomes loose, it is simply taken away. The film now adheres to the glass plate in an imperfect

manner, therefore a little care is needed to keep it on the glass. It is washed under the tap by keeping the film at one corner with the thumb, then an ordinary gold bath is poured over it, and, a convenient tone having been reached, it is fixed with hypo solution 1 : 10, washed thoroughly under the tap, and allowed to dry. For large sizes, it is better to first coat the glass plate with solution of gelatine; this prevents the film from slipping. For small sizes, many operators succeed perfectly well without the gelatine. For reproducing negatives, no toning bath is used, and from the obtained diapositive a negative is printed in the same way as described above.

*Professor Eder's Orthochromatic Collodion Emulsion.*—I have just been favoured by my highly esteemed colleague, Dr. Eder, with a paper containing a description of his new method of preparing collodio-bromide emulsion, which method he has now established at the new Photographic Teaching and Experimental Institute at Vienna, being under his able direction. This method, as Professor Eder says, is exceedingly simple, and throughout certain. The emulsion is prepared in the following manner: A.—15 grammes of crystal nitrate of silver are dissolved in 12 c.c. of water, then 90 c.c. of alcohol (95°) are added, and then mixed with 150 c.c. of 4 per cent. plain collodion. B.—15 grammes of pure crystallized bromide of cadmium are, by application of slight heat, dissolved in 75 c.c. of alcoholic eosine solution (1:800), and then 150 c.c. of 4 per cent. plain collodion are added. The bromide solution is now in the dark room gradually added to the silver solution and well shaken, till of the bromide solution only 5 to 10 c.c. are left; then the trial is made whether the emulsion still contains an excess of silver nitrate. This emulsion, namely, will prove to be satisfactory only in cases where it contains still a small excess of silver nitrate, which leads to the formation of eosine silver. If the bromide be in excess, then the much less sensitizing action of the eosine alone would be predominant, and the sensitiveness of the emulsion would be very low. To make the trial, a few drops of the emulsion are poured on a glass plate, allowed to settle, and a drop of a solution of yellow potassium chromate is poured over it. If there is still a great excess of silver nitrate, an intensively cherry spot will be formed (chromate of silver); in this case a little more of the bromide solution is added, and then the trial repeated. As soon as but a feeble orange coloured spot is formed, the emulsion may be used. (An emulsion with a great excess of silver gives more sensitive and vigorous films, but unclear and often fogged ones; if, however, the excess of silver is too small, the emulsion will become insensitive, and the orthochromatic action will be reduced. If this be the case, 1 gramme of silver nitrate is dissolved in a few drops of water, then 10 c.c. of alcohol are added, and the solution is gradually mixed with the emulsion, until it gives a good negative, if an exposure is made for a trial. (Emulsions containing much colouring matter will also stand to more nitrate of silver.) The emulsion can be used at once, but it will be better to employ it not before twelve to twenty-four hours. To the glass plate to be coated with the emulsion, some india-rubber solution is applied around the edges, then it is collodionized as usually, allowed to settle, and then immersed in a dish containing well-water, where it remains until all greasiness disappears. By this the nitrates contained in the unwashed original emulsion are eliminated. It will be best to expose the coated plates while they are still wet, as they will become less sensitive after drying. The exposure will be about half as long as in the case of wet collodion plates, which are subsequently to be developed with iron oxalate. The most paintings can be photographed without the use of a yellow screen if this emulsion is employed; dazzling blue may be subdued eventually by the aid of a yellow screen, prepared with aurantia collodion. The exposed plates may be developed either with iron-oxalate, or pyro-soda, or pyro ammonia; but the following formula serves very well:—



A.—Water ... ..	100 parts
Sodium sulphite ... ..	10 "
Potassium bromide ... ..	3 "
Citric acid ... ..	1 part
Pyrogallie acid... ..	2½ parts

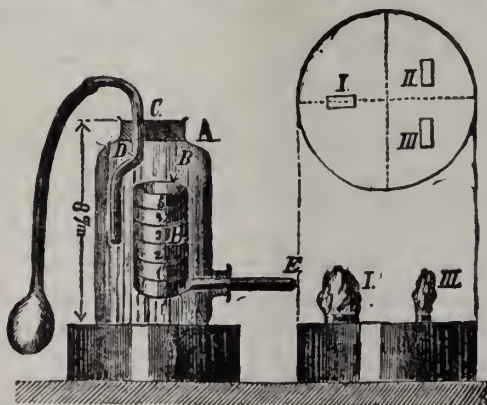
B.—Ammonia ... ..	1 part
Water ... ..	6 parts

Before use are mixed—

Water ... ..	100 c.c.
Pyro-solution (A) ... ..	10 c.c.
Ammonia solution (B)... ..	10 c.c.

The picture comes out very soon, and will be developed after thirty to fifty seconds. They are fixed in the ordinary hypo solution. Should it happen that the plates are fogged with this developer, then 6 parts of B, 12 parts of A, and 100 parts of water may be mixed. It seems to be deserving notice that, if the exposure is protracted too far, the silver deposit of the collodio-bromide emulsion plates is of a reddish colour. After fixing, the plates are washed, poured over with 50 per cent. alcohol, to remove the last traces of eosine, and once more washed with water. Intensifying, though being very seldom necessary, can be done with silver and pyro and citric acid. Reducing the negatives will be often necessary. For this purpose the well-known mixture of hypo solution with red prussiate of potash serves well. The emulsion will keep eight to fourteen days, but at the end of this time fog will often make its appearance. If it is desired to have an emulsion which keeps, it should be prepared with a slight excess of bromide, to which the silver nitrate in excess is added only just before use. Good results are also obtained if the emulsion is precipitated with water, washed, dried, dissolved in ether-alcohol, mixed with colouring matter and silver nitrate, and then used. The first described method is, however, simpler, quicker, and less expensive.

*A Simple Arrangement for Magnesium Flash-Light.*—A correspondent of *Der Amateur Photograph*, L. Schulthess, of Zurich, has constructed a simple and effective arrangement for firing the magnesium powder, dispensing with the dangerous potassium chlorate. In the sketch I give



here, A represents a tubulated glass bottle, into which a graduated glass tube, B, is inserted. At the top of the bottle the wide neck is stoppered with a cork, C, which is pierced by a glass tube, B. To this glass tube a piece of india-rubber tubing is attached, terminating in a pneumatic ball. The outlet, E, of the glass tube, B, being about  $\frac{1}{16}$  of an inch wide, is directed against a spirit lamp which has three flames. To use the apparatus the desired quantity of the magnesium powder is placed into B, then the lamp is lighted, and by pressure on the india-rubber ball the magnesium powder is blown through the glass tube, E, against the flame, I. All of the powder which passes this flame without being ignited will be taken up

by the flames II and III. As to the glass tube, D, it should not be adjusted with its end over the receptacle, B, otherwise the magnesium powder would be whirled up and scattered by the direct air current.

### Notes.

The United American Photographic Exhibition, as organised by the Photographic Society of Philadelphia, the Society of Amateur Photographers of New York, and the Boston Camera Club, was opened on the 7th inst., and has given much satisfaction to the visitors; and organisers of exhibitions in Europe may learn several lessons from it.

The catalogue is something more than a bare list of frames, as not only is each photograph in a series lettered, but against each are numerous particulars calculated not only to interest, but also to instruct the visitor. As an example we may give the following:—"W. K. Means, Boston Gas Light Co., *Boston Camera Club*, 283a, Waterworks Reservoir, Pittsfield, N. H. *Lens*—Darlot rapid hemispherical, No. 1. *Developer*—Pyro, potash, and soda. *Plate*—Carbutt, B. *Print*—Albumen silver; not by exhibitor."

The Photographic Society of Great Britain was contrasted with that of France in a note which appeared in the first column of p. 313 of last week's News; but the note was made rather unintelligible by the striking out of "French" from the beginning of the tenth line. Readers are requested to insert the necessary word.

Last week we referred to Professor Cohn's use of the magnesium flash-light as a means of obtaining records in ophthalmic surgery, and we now give a sketch of the apparatus he uses.

The main feature consists of a benzoline lamp, *h*, fitted with an asbestos wick, and provided with an arm, *f* *g*, which arm carries a tube, *e*, upon which is fitted a small



funnel, *t*, provided with a lid. A little magnesium powder having been put in the funnel and the lid closed, air is



forced through the flame by pressing the india-rubber pear, *b*. A benzoline flame is said by Professor Cohn to possess special advantages over a Bunsen or spirit flame.

It seems that the English photographers who practise the various photo-mechanical processes rather hesitate to exhibit in next year's Paris exhibition. The reason is not far to seek, the French being admittedly our masters in work of this sort, and our representatives lack the courage to compete with them on their own ground. It is to be regretted, but it is natural enough; still, hardly the way to promote business, and we fancy our Yankee friends will be more enterprising.

Astronomical photography has its pleasures. The most successful and the best known of our astronomical photographers was, in the early days of this branch of photography, engaged in the investigations which eventually gave us the picture of the Nebula of Orion. He was using an ordinary camera fitted on an equatorial stand, and it was necessary, by means of the finder, to keep the camera steady on a star, the eye never being removed from the telescope for more than the briefest interval during the hour-long exposure. On one occasion, the tired astronomer, after the end of the hour, reached out his hand to replace the cap of the camera, when he found the operation needless, the cap never having been removed. Under these circumstances there were only two things to be done—to go straight, and speechless, to bed, or to set to work and repeat the exposure. Of course Mr. Common adopted the latter alternative, and earned the workman's best reward—the satisfaction of having done something.

Some of the fashionable photographers were very busy last week photographing the ladies presented at Court. In many instances they went to be photographed, after the ceremony, and a contemporary remarks that "some of the ladies looked very tired." It is doubtful whether these photographs will be anything more than a memento of the occasion, as for them to be flattering, or even pleasing portraits, is out of the question. In the arrangements made for leaving Buckingham Palace "some one had blundered," and the unfortunate ladies and their chaperons had in many cases to wait three-quarters of an hour for their carriages. What a preparation for having one's portrait taken! First the worry and nervousness, and the anxiety about dress; next the crush in the ante-room, and the possible loss of a feather, or the risk of a torn dress; then the awful ceremony itself, and the consciousness that the curtsy was not as graceful as it might have been; and, lastly, the waiting, tired and hungry, for the carriage. In what a terribly limp and jaded condition some of these unfortunate ladies must have reached the photographer's!

The complaint as to an annoying neighbour is not always on the side of the photographer, as it was in the case of Elliot and Fry last week. Some time ago the owner of a

house with a studio attached, let the latter and a couple of rooms for a period of six months to a photographer. When the latter had possession and commenced to work, the landlord discovered that the chief trade was done on Sunday. As the landlord had no sabbatarian views, and did not live on the premises, he did not care very much, but the neighbours did. There is no one so intensely respectable as the suburban resident, and the holy horror of the good people who lived in villas may be imagined at the glaring breach of the fourth commandment. Moved by their expostulations, the landlord remonstrated with the tenant, but was met with the rejoinder that there was nothing in the agreement about not opening on Sunday, in addition to which, if he did not work on Sunday, he could not pay his rent, for his takings on that day were as much as those for all the rest of the week. Nothing could be done save an enforcement of the Act of Charles II. of pious memory. However, no one cared to take action, and so the photographer remained his six months, and then, to the relief of the neighbours, gave up possession, and sought another neighbourhood.

"You have done well this Bank Holiday, of course," an itinerant photographer on one of the commons near London was asked on Monday. "No, I haven't," was the reply; "it's a good deal too fine for me." "Too fine! what do you mean? I should have thought the weather was just right for photography." Oh, it's all right one way, but not another. You see, holiday people with a little money have gone right away, and the fine day's tempted 'em. Now when it's dull, they just wander about and not far from where they live, and if they've nothing better to do they patronise me and praps the public house."

## Patent Intelligence.

### Applications for Letters Patent.

7039. JOSEPH FRANCOIS FETTER, 7, Westminster Chambers, for "An apparatus for enlarging photographic negatives."—May 11th, 1888.
7067. A FUHRMANN, Bridge Street, Manchester, for "Circulating stereoscopic panorama."—[Complete Specification.]—May 12th, 1888.
7070. JOSEPH DAY, Scout Hill View, Dewsbury, for "An improved stereoscope and method of lighting the same."—May 12th, 1888.
7176. WILLIAM PHILLIPS THOMPSON, 6, Lord Street, Liverpool, for "Improvements in combined diaphragms and shutters for photographic and other lenses."—(*Edward Bausch, United States.*)—[Complete Specification.]—May 15th, 1888.
7212. JOSEPH FRANCOIS FETTER, 7, Westminster Chambers, London, for "An apparatus for showing exactly the position in the camera of the object that is to be photographed."—May 15th, 1888.
- 7,348. W. C. HUGHES, Brewster House, Mortimer Road, Kingsland, London, N., for "Improvements in magic lanterns for enlarging or otherwise, and in apparatus used in connection therewith."—[Complete Specification.]—May 17th, 1888.

### Application for Amendment.

In the matter of an application by FREDERICK BARR, of 28, Clarendon Road, Walthamstow, for Letters Patent for the invention of "Improvements in camera stands, dated the 20th January, 1888. No. 907.

Notice is hereby given that the above-named FREDERICK BARR has applied, under the provisions of the Patents, &c., Act, 1883,



for leave to amend the above-mentioned application for a patent by inserting therein the name of THOMAS PARSONS WATSON, of 313, High Holborn, London, Optician, and constituting him an applicant for the said Letters Patent jointly with the said FREDERICK BARR.

Any person or persons intending to oppose the said application for amendment must leave notice of objection thereto (on Form G), at the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C., within one calendar month from the date hereof.—Dated this 19th day of May, 1888.

H. READER LACK, Comptroller-General.

**Patent on which the Tenth Year's Renewal Fee has been Paid.**

2,084 of 1878. A. DAVIS. (*Hoffman*).—Tripod heads.

**Patent which has become Void through Non-payment of the Fourth Year's Renewal Fee.**

2,981 of 1884. W. B. WOODBURY.—Producing printing blocks by photography.

### Specifications Published.

5903. THOMAS RUDOLPH DALLMEYER, of 19, Bloomsbury Street, in the County of Middlesex, Optician, and FRANCIS BEAUCHAMP, of High Cross, Tottenham, in the County of Middlesex, Engineer, for "Improvements in what are known as instantaneous photographic shutters."—Dated 22nd April, 1887.

A shutter founded on the iris diaphragm. The full Specification will appear next week.

3259. JOHN PLACE, of Bull Street, Birmingham, in the County of Warwick, Optician, for "Improvements in photographic shutters."—Dated 3rd March, 1888.

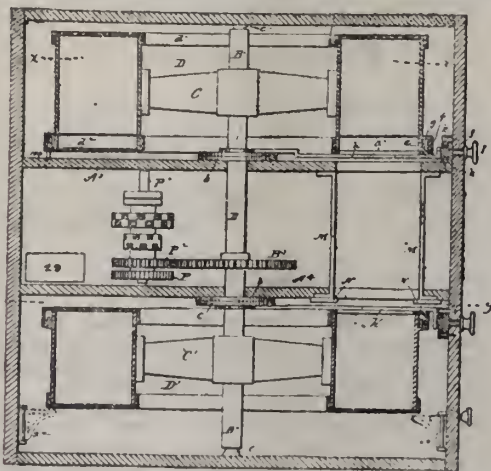
An arrangement somewhat similar to the early Dallmeyer shutter, or the Noton shutter, but operated by cords.

### Patents Granted in America.

378,126. EDWARD N. BLISS and JAMES F. MIDDLETON, Newark, N.J., "Automatic electric photographing apparatus."—Filed April 13, 1887. Serial No. 254,614. (No model).

*Claim*.—1. In a camera, a shaft, carrying at each end a drum, one of which drums is adapted to hold sensitive plates, and the other adapted to hold the same plates after they have been exposed, the drums being tight on the shaft and turning with it, as described.

2. In a camera, a shaft, carrying at each end a drum, one of which is adapted to hold sensitive plates, and the other adapted



to hold the same plates after they have been exposed, the drums being tight on the shaft and turning with it, in combination with a motor for moving the shaft, as described.

3. In a camera, a shaft, carrying at each end a drum, one of which is adapted to hold sensitive plates, and the other adapted to hold the same plates after they have been exposed, the drums being tight on the shaft and turning with it, in combination with a motor for moving the shaft located within the camera, as set forth.

4. In a camera, the combination, with a permanent shaft having connections with a suitable motor, of a removable shaft

having clutches for attachment to the permanent shaft, the said removable shaft forming the support for a plate-holder or reservoir, as set forth.

5. A camera consisting of two drums, one of which is adapted to revolve above the other, each provided with receptacles for sensitive plates, a chamber between the said drums, and a holding or retaining device within the said chamber, the chamber being provided with the usual opening for the exposure of a plate, and the said opening being covered by a shutter, as set forth.

6. A camera consisting of two drums and a chamber between the same, both drums being connected with a common shaft, and each having receptacles for sensitive plates, the upper drum having a slot in its lower cover or cap, and the lower drum having a corresponding slot in its upper cover, the said slots registering at their edges with vertical slots in the chamber, as and for the purpose set forth.

7. A camera consisting of two drums, and a chamber between the same, both drums being connected with a common shaft, and each having receptacles for sensitive plates, the upper drum having a slot in its lower cover or cap, and the lower drum having a corresponding slot in its upper cover, the said slots registering at their edges with vertical slots in the chamber, a retaining device within the said chamber, the chamber being provided with the usual opening for the exposure of a plate, and the said opening being covered by a shutter, as and for the purpose set forth.

8. The combination, with a drum having receptacles for sensitive plates, of retaining devices for the said plates, a motor for rotating the drum, and releasing devices brought into operation by the rotation of the drum for dropping the plates successively, as set forth.

9. In a camera, a sectional shaft provided with clutches for making proper joints, two of the sections supporting plate holders or reservoirs, and being detachable and removable, for the purpose set forth.

10. In a camera having hinged or removable top and bottom, the combination, with the said top and bottom, of pintles attached thereto or formed thereon, and a sectional shaft, for which the said pintles form the bearings when the top and bottom are in place.

11. In a camera having hinged or removable top and bottom, the combination, with the said top and bottom, of pintles attached thereto or formed thereon, and a sectional shaft, for which the said pintles form the bearings when the top and bottom are in place, the said shaft being provided with clutches for making proper joints, two of the sections supporting plate-reservoirs and being detachable and removable, for the purpose set forth.

12. The combination, with a drum having receptacles for holding sensitive plates, and a motor for rotating the said drum, of a cap covering the bottom thereof, the said cap being stationary, and being provided with a slot through which the plates are adapted to fall successively as the drum is rotated.

13. The combination, with a rotating drum having receptacles for holding sensitive plates, of a cap covering the bottom thereof, the said cap being stationary, and being provided with a slot through which the plates are adapted to fall successively, as described.

14. The combination, with a rotating drum having receptacles for holding sensitive plates, of a stationary cap covering one end thereof, the said drum and cap being provided with interlocking devices, whereby the removal of the drum also causes the removal of the cap, as and for the purpose set forth.

15. The combination, with a rotating drum having receptacles for holding sensitive plates, of a stationary cap covering one end thereof, the said drum being provided with a horizontal flange which slides upon rollers attached to the cap, substantially as set forth, whereby the drum can be rotated freely while the cap remains stationary.

16. The combination, with a rotating drum having receptacles for holding sensitive plates, of a stationary cap covering one end thereof, a slot in the said cap, and a slide adapted to cover said slot, the drum, cap, and slide being secured together, whereby the drum can be removed without exposing the sensitive plates.

17. In a camera, the combination, with a shaft supporting a drum which is provided with receptacles for holding sensitive plates, of a slide covering a slot in one end of the said drum, the said slide being swivelled to the shaft, and having a detachable handle, which extends through one wall of the camera in a manner to be operated from the outside thereof.

18. In a camera, the combination, with a plate-holder or reservoir, of a number of folding brackets attached to the walls of the



camera, the said brackets being connected with each other and with a lever extending through one wall by bell cranks and rods, substantially as described.

19. A shutter for photographic cameras, consisting of a pair of screens mounted on arms adjustably secured to a shaft, whereby the shutter may be worked alternately from one side to the other without resetting.

20. The combination, with a pair of shutter-arms adjustable upon a shaft, of a fixed arm with which the shutter-arms have connection.

21. The combination, with a pair of shutter-arms adjustable upon a shaft of a slotted fixed arm, a pin moving in a slot therein, and a pair of links connecting said pin with the shutter-arms, for the purpose of regulating the time of exposure.

22. In a camera, the combination, with a shutter having adjustable arms and a motor for operating the said shutter, of adjustable detents for limiting its motion in either direction.

23. The combination, with the commutators  $RR'$   $R^2$ , of an electric generator and circuits and connections, as described, including a circuit-closer and electro-magnets, whereby, as a result of the operation of the circuit-closer, the camera-shutter will be reversed, the plate dropped, the drum released, rotated, and locked, and a new plate inserted in place of the old, the said operated parts being located within a camera-box.

24. In a camera, the combination, with a shutter, of an electro-magnetic motor for operating the same, a commutator in the circuit of the said motor, and electro-magnetic devices operated by the closure of the motor-circuit for reversing the commutator connections, whereby repeated closures of the motor-circuit will actuate the shutter in opposite directions without resetting.

25. In a camera, the combination, with a shutter, a plate-supporter, a plate-holder or reservoir, and a detent for the said plate-holder, of electro-magnetic devices and circuits and connections, substantially such as described, whereby a single closure of the circuit will operate the shutter, remove and restore the plate-supporter, release the plate-reservoir and rotate the same for the dropping of a new plate, and restore the detent.

26. In a camera, the combination, with a drum having receptacles for holding sensitive plates and a shaft on which said drum is mounted, of an electro-magnetic motor operatively connected with the said shaft, as and for the purpose set forth.

27. In a camera, the combination, with plate-supporting arms or levers centrally pivoted, of pins projecting from said arms or levers into an opening of substantially triangular shape in armature rod or bar, whereby, on the operation of the magnet connected with the armature of the said lever, the outer ends of the said plate-supporting arms or levers will be spread apart and release the plate, as set forth.

28. In a camera, the combination, with an electric generator, a motor in the circuit thereof, and a shutter operated by the said motor, of detents for the said shutter forming the terminals of a second circuit, the said second circuit being operatively connected with devices for releasing a sensitive plate, whereby the shutter is first reversed to expose the plate, and the plate is afterward dropped.

29. In a camera, the combination, with an electric generator, a magnet in the circuit thereof, and plate-supporting arms or levers which are operated to release the plate when the magnet is energised, of a circuit-closer brought into operation by the release of a plate for closing another circuit through a magnet which operates a detent for the plate holder or reservoir.

30. In a camera, the combination, with a battery, a magnet in the circuit thereof, and a detent for the plate-holding drum or reservoir operated by the said magnet, of a circuit-closer brought into operation by the action of the said magnet, the said circuit-closer serving to close another electric circuit through a magnet which operates the drum or reservoir.

31. In a camera, the combination, with a drum having receptacles for holding sensitive plates, of a series of holes formed in the wall or casing of the said drum, a spring-bolt adapted to enter any one of the said holes, and an electro-magnet for operating the said bolt, as and for the purpose set forth.

32. The combination, with a rotating drum having receptacles for holding sensitive plates, of a stationary cap covering the bottom thereof, a rib extending centrally along the said cap, and a series of rods each provided with a flange which extends along the bottom of one of the said receptacles, and supports a sensitive plate, the said rib and cap being cut away to form a slot, through which the said plates are adapted to fall successively as the drum is rotated.

33. The combination, with a ratchet mounted upon a shaft

which forms part of a battery-circuit, and an armature also forming part of a circuit of the same battery, of an isolated pawl for operating the said ratchet, the said pawl being attached to the said armature, and the said shaft carrying a series of commutators connected up in circuit with photographic apparatus, substantially as and for the purpose set forth.

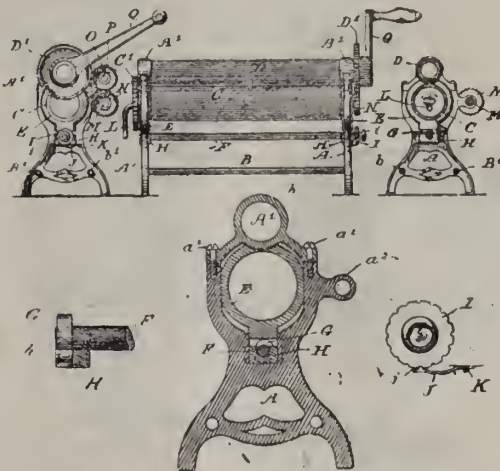
34. The combination with a rotating drum having receptacles for holding sensitive plates, with a battery and a primary-circuit closer in circuit therewith, of secondary-circuit closers controlling branch circuits and operated electro-magnetically by the actuation of the first-named circuit-closer, the said branch circuits having a return-connection between the primary-circuit closer and the battery, whereby the circuits controlled by the said secondary-circuit closers will be operated, even though the first circuit-closer should be released before their operation is accomplished.

35. In a camera, the combination, with a drum having receptacles for holding sensitive plates, a series of holes formed in the wall or casing of the said drum, and an electro-magnetically-operated spring-bolt adapted to enter any one of the holes, of a spring on the said bolt, which is brought into contact with a second spring when the bolt is drawn, the two springs forming the terminals of a circuit which includes an electro-magnetic motor for operating the said drum, as and for the purpose set forth.

36. The combination with a conducting-frame within which a sensitive plate is adapted to slide, of a spring pin or bolt actuated by the said plate when in place, and a spring pressing against the said pin, the said spring and frame constituting the terminals of an electric circuit which includes an electro-magnet for releasing a plate-holder, whereby as soon as a plate is dropped the plate-holder is released and made ready to be moved forward for supplying a new plate in place of the old.

379,314.—WILLIS G. C. KIMBALL, Concord, N.H., "Photograph burnisher."—Filed Sept. 15th, 1887. Serial No. 249,772. (No model.)

Claim.—1. In a photo-burnisher, the combination, with the feed-roll, of a hollow adjustable internally-heated burnishing-roll of larger diameter than said feed-roll, the former located



above the latter, gearing whereby their complete revolutions are made in unison, and suitable standards and bearings, arranged substantially as and for the purpose set forth.

2. In a photo-burnisher, a feed-roll mounted in stationary bearings, a burnishing-roll mounted in adjustable bearings, one of said rolls being of larger diameter than the other, gearing whereby their complete revolutions are made in unison, mechanism comprising a revolving shaft, and cams or eccentrics for adjusting said burnishing-roll in a plane parallel with the feed-roll, and suitable standards and bearings, all substantially for the purpose described.

3. In a photo-burnisher, the combination of a feed-roll, a hollow burnishing-roll of larger diameter than said feed-roll, gearing by which said rolls revolve equal one with the other, mechanism comprising a shaft and eccentrics for adjusting said burnishing-roll in a plane parallel with the feed-roll, an operating-crank, and suitable supporting standards, all substantially for the purpose set forth.



4. The combination of a feed roll, a hollow internally-heated vertically adjustable burnishing roll of larger diameter than said feed roll, gears for revolving said rolls equal one with the other, mechanism for adjusting said burnishing-roll in a plane parallel with said feed-roll, an operating-crank, and suitable supporting-standards, all constructed and operating substantially for the purpose set forth.

379,343. JOHN E. THORNTON, Manchester, County of Lancaster, England, for "Photographic camera."—Filed July 16th, 1887. Serial No. 244,547. (No model.) Patented in England Feb. 24th, 1886, No. 2,670.

*Claim.*—1. The combination, with a photographic camera, herein described, of the angular sliding plates, fork, and struts, and flat springs, substantially as shown and described.

2. In the extension-frame of a photographic camera, the rack or racks, with teeth formed on their upper and lower edges, and in combination therewith the bottom pinion and the extension-pinion, actuating the angular side sliding-plates, carrying fork, stretchers, and front board, substantially as described.

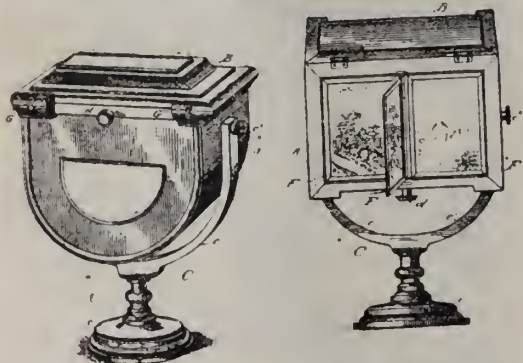
379,377. WILLIAM J. M. DOBSON, BROOKLYN, N.Y., for "Photographer's kit."—Filed Feb. 15th, 1887. Serial No. 227,652. (No model.)

*Claim.*—1. In a kit for photographers' use, the pair of central cross-bars and a set of clamps adapted to serve in an ordinary plate-holder, substantially as herein specified.

2. In a kit for use in the photographic dry plate holder, a set of two or more adjustable clamps, each having a clutching arm or hook and adjusting point in combination with cross-strips engaged with the plate-holder, all arranged for joint operation, substantially as and for the purposes described.

379,522. GEORGE M. PORTEUS and FREDERICK S. MILLER, Chicago, Ill., for "Photograph-exhibitor."—Filed Jan. 23, 1888. Serial No. 261,687. (No model.)

*Claim.*—1. As an improvement in photographic exhibitors, the tilting case A, pivotally mounted upon a supporting-stand, and provided with a hinged lid which can be opened and thrown back out of the way when the box is tilted to bring its top to a side position, and a set of photograph-holders, and mechanism, substantially as set forth, for supporting and operating the same, contained within the case and arranged, whereby when the



top of the box is brought to one side and opened the photographs can be successively projected out from the box for inspection, substantially in the manner described, said members being all combined and organised substantially as and for the purpose specified.

2. The combination of the tilting case A, provided with a flat hinged lid B, for opening and closing the top of the case, the set of photograph-holders, and mechanism, substantially as described, for operating the same, contained within the box, a locking device for temporarily holding the box at the required angle, and the stand C, having arms c' c', whereon the box, pivotally supported to tilt about a horizontal axis, all constructed and arranged substantially as shown and described, and for the purpose specified.

379,964. WILLIAM H. LEWIS, Brooklyn, assignor to E. and H. T. Anthony & Company, New York, N.Y., for "Photographic apparatus."—Filed October 14, 1887. Serial No. 252,342. (No model.)

*Claim.*—1. The combination, in a bellows-supporter, of an upper and a lower supporting-piece, united by extensible connecting devices, substantially as described.

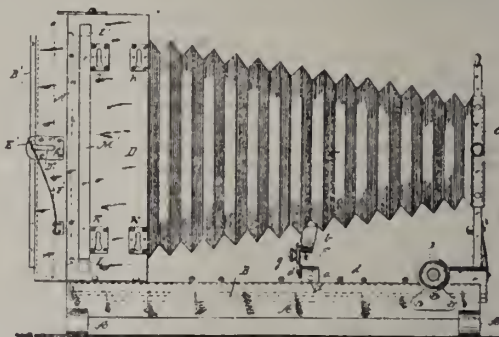
2. The combination, in a bellows-supporter, of an upper and a lower supporting-piece, united by extensible pivoted strips, the ends whereby are geared into each other, as and for the purposes set forth.

3. The combination, in a bellows-supporter, of an upper and lower supporting-piece, united by extensible connecting-strips, and a set-screw, whereby friction may be applied to the movable parts, as and for the purposes set forth.

4. The combination, in a bellows-supporter, of an upper and a lower supporting-piece, united by extensible connecting devices, and slotted plates on the under side of the lower supporting-piece, which engage with corresponding devices on the frame of the apparatus, whereby the supporter will be held firmly in place as and for the purposes set forth.

5. The combination, in a photographic camera, of a spring-controlled ground-glass plate and double supports for the plate, against which it is held by spring action, whereby the plate will be supported and held in two positions, one of them coincident with the plate on which the picture is to be taken, and the other sufficiently rearward thereof to allow of the insertion of the plate-holder, substantially as set forth.

6. The combination, in a photographic camera, of a spring-controlled ground-glass plate and double supports for the plate, against which it is supported and held by spring action,



whereby the plate will be supported in two positions, one of them coincident with the plate on which the picture is to be taken, and the other sufficiently rearward thereof to allow of the insertion of the plate-holder, the parts being constructed and arranged in such a manner that upon the release of the ground-glass plate from its said rearward resting-place it will be pressed against the plate-holder by spring action, substantially as and for the purposes set forth.

7. The combination, in a photographic camera, of a plate-holder-supporting frame A', ground-glass frame B', having pins E', plates C', having bayonet-jointed slots D', and springs F', substantially as and for the purposes set forth.

8. The combination, in a photographic camera, of a plate-holder-supporting frame A', ground-glass frame B', having supporting-pins E', plates C', having guides for the pins E', and springs F', substantially as and for the purposes set forth.

## Correspondence.

### ACCIDENTAL DESTRUCTION OF NEGATIVES.

SIR,—We have read the article on Debenham and Gabell v. Morgan and Kidd in your issue of May 4th, and also Mr. Debenham's letter on the same subject in that of last week. Will you allow us to add a few words of comment, as unless the main issue on which the case depended is clearly seen, there is a danger of very misleading deductions being made from the verdict.

The whole case turned on the question of whether we had or had not taken sufficient care of the negative entrusted to us to make us irresponsible for the damage that unfortunately occurred to it while in our possession. The negative was broken on its way home. Our messen-



ger had it wrapped in paper only, and was carrying it in his hand. Our contention was that the negative was safer in the hands of our messenger—an experienced man used to the handling of negatives—than if it had been sent by post in a slight cardboard box as forwarded to us by Messrs. Debenham and Gabell. The Judge gave a verdict against us because he was of opinion that the negative was not safe in the hands of our messenger without a box or some protective wrapper, and therefore sufficient care had not been taken to absolve us from the consequences of the accident.

The case, of course, presents no novel feature, and will not be of much service as a precedent, as it was already quite clearly established that a firm is responsible for any accident occurring to an article in its possession if it can be proved that due and reasonable care was not taken of that article to protect it from ordinary risks. But, on the other hand, a firm would certainly not be liable for damage occurring if owners failed to prove that the accident was the result of carelessness. It is obvious that if ordinary care taken was not a sufficient plea, trade enlargers, printers, retouchers, &c., could not carry on their business, as in spite of whatever care is used, when thousands of fragile negatives are handled, occasional accident is quite unavoidable. If these unfortunate workers for the trade were to be heavily penalised whenever an accident occurred, their earnings would be decidedly precarious; especially as they would often find, to their cost, that the dead donkey is worth considerably more than the live lion.

For our part we do not challenge the ruling of the Judge, but we think our negligence was not very gross or hard to excuse, and was parted from reasonable care by a very fine line indeed. We shall, however, endeavour to treat our customers' negatives with even more care than formerly. For our own sakes, and for the sake of all workers having charge of negatives for a time, we have thought it advisable to point out as clearly as possible under what conditions we are and are not legally responsible for damage done to a negative while in our possession. —Yours faithfully,

MORGAN AND KIDD.

*Argentic Gelatino-Bromide Works, Kew Foot Road, Richmond, London, S. W., May 15th, 1888.*

[This letter, though dated 15th, came in an envelope bearing the Richmond post stamp of the 17th.]

#### THEORETICAL CONSIDERATIONS IN EXPOSURES.

SIR,—Sir David Solomons in your last issue says, with reference to the meeting of the Photographic Society at which his paper was read, that he felt aggrieved at a mine being sprung upon him at the eleventh hour. As one of the speakers who criticised and pointed out the errors in his paper (Capt. Abney and Mr. T. R. Dallmeyer were the others), I think that I have a right to "feel aggrieved" at such a preposterous charge being made. How can the criticism of a paper at the very meeting at which it was read, in the presence of the author who has the right of reply, be "springing a mine"? and what is the reference to the eleventh hour? Ought we to have spoken before we knew what he was going to say?

Sir D. Salomons, whilst admitting the errors referred to, now puts it that he knew better at the time, and speaks of the one relating to the objects not altering in size with their distance as an obvious oversight. If he did know this simple elementary optical law at the time, he seems to have forgotten it again since then, for, in slightly altered form, he repeats the same absurdity as that contained in his paper. He now says that "objects moved along the line of depth of focus, when this is infinite, do not alter appreciably in size." According to his own or any rational definition of depth of focus, any extra terrestrial object—say the moon, and any other at a greater or infinite distance beyond—will be within the planes of depths of focus, and according to Sir D. Salomons' amended propo-

sition, the moon would not diminish in apparent diameter if removed to the distance of Jupiter or of Sirius. Therefore, if at those distances she would preserve her present apparent great superiority of size, she must actually be as much larger than those orbs as she appears to the eye to be. Again, he says that a ship at distances of one mile off and of two would, with a very short focus lens, appear as of one size, and that the smaller the stop the nearer would the images appear to be of one size. As a matter of fact, so long as the images could be defined, the one ship would appear to be of double the length of the other; and shortness of focus of lens, or size of stop, has nothing whatever to do with it.

No doubt there is something to be said in favour of papers being looked through by a competent person before being presented to a meeting, but this rule, where it exists, is not intended for the instruction of the author, but to prevent the time of the members being wasted, and the Society itself from being made ridiculous, by gravely entertaining crude speculations the promulgation of which an elementary knowledge of scientific laws would have at once prevented. It appears to me that the best thing to do when such papers are read (and I have to go back nearly a quarter of a century to remember such another at the "parent" Society) is for the members present to show by their criticism that the Society does not acquiesce in the statements put forward.

W. E. DEBENHAM.

#### Proceedings of Societies.

##### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

At the technical meeting of this Society held on Tuesday evening, the 22nd inst., the chair was taken by H. TRUEMAN WOOD.

FRIESE GREENE showed some portraits taken by the magnesium flash light. He had not found that the public were satisfied with the photographs taken in this manner, complaining that they were made to look too old, though they did seem to like the process of being thus photographed. He had sometimes added nitrate of strontium to the magnesium, in order to obtain pictures which should not require so much retouching. He considered that there was a saving of about one-third of the retouching when nitrate of strontium was used. On one occasion, however, he had had an explosion when using this mixture, which evidently requires great care.

W. E. DEBENHAM suggested chloride instead of nitrate of strontium, to avoid the danger of explosion.

FRIESE GREENE had tried it, but in that case had not found any saving in the retouching.

W. T. WILKINSON showed a negative taken on a rapid chloride plate and developed with soda. It was a copy of a line subject made for a "process" purpose. It was, he said, intense enough, the blacks being so perfectly clear—like collodion, in fact. Like collodion, too, the negative could be intensified, if desired, with silver. Negatives thus made were applicable either for half-tone printing processes, or for "gridiron" blocks, as they were called, for printing in the typographic press.

F. BEDFORD thought it remarkable that these chloride plates could be developed with pyro and ammonia, which method was generally said to be inapplicable to the development of chloride emulsion.

The CHAIRMAN said, that as he was interested in the Paris Exhibition of 1889, he was anxious to know what English photographers and makers of apparatus were likely to send there, and the amount of space which they would require.

F. GREENE had some very early photographs of Paris taken by Fox Talbot, which he would be happy to send.

W. H. HARRISON said that historical exhibits were particularly desired by the authorities of the Exhibition, and that for these there was to be no charge for space.

A Member brought up the subject of the Society's standards for flanges and screws, and regretted that they were not more universally adopted.

F. GREENE said that he had taken a gelatine plate and covered it with green glass and ground glass. He had then exposed it for a short time to the light of an incandescent electric lamp. After this it had proved to require only half the exposure in the camera that would otherwise have been required.



W. E. DEBENHAM said that a similar plan had been to some extent adopted in the collodion days. Various colours and ways of lighting were recommended for this, which was called auxiliary exposure. It was found, however, to be of no consequence what was the character or source of light, so long as the proper amount was given. He had also tried it with gelatine plates, but these generally lost in quality by the action.

W. ENGLAND remembered a similar sort of proceeding earlier still in the Daguerreotype era, when it had been recommended to line the camera with white.

J. B. B. WELLINGTON showed some photographs printed in platinum by the Pizzighelli printing-out process. He had found no difficulty in his first attempts, following the published directions—using, not the arrowroot, but the gum formula—the gum and all the chemicals being mixed in one solution and applied to the paper with a brush. He had also successfully applied the bichloride of mercury for sepia tones.

T. BOLAS inquired whether the last speaker had found anything to indicate inferiority in the process, or had he found any difficulty in preparing the sodium ferric oxalate.

J. B. B. WELLINGTON thought the results superior to those of the ordinary platinum process, being richer. The sodium ferric oxalate he had procured ready made from Hopkin and Williams. He preferred to coat the paper himself, and considered it better than that which was to be bought.

THE ASSISTANT-SECRETARY said that when these technical meetings were established, one of the points insisted upon was that results should be shown at them. He had had a communication from Sebastian Davis, who wished that circumstance brought into notice, as for a long time past their attention had been almost entirely devoted to apparatus and processes, and results had been but very little shown.

THE CHAIRMAN observed that on that evening they had all results before them.

F. BEDFORD showed an enlargement of three diameters, from a negative taken with detective camera.

#### NORTH LONDON PHOTOGRAPHIC SOCIETY.

AN ordinary meeting was held on May 15th, J. TRAILL TAYLOR in the chair.

Several members exhibited prints from negatives taken on the preceding Saturday at Enfield.

THE PRESIDENT opened the discussion on "Detective Cameras" by exhibiting and explaining one of the form first introduced by the Scovill Company, and which has formed the model for many of the English detective cameras now in the market. It consisted practically of a small bellows-bodied camera enclosed in a leather-covered case, which also provided space for carrying several dark slides. All the motions necessary for taking a picture, except that of changing the dark slide, could be performed without opening the case, the focussing lever, trigger, and screw for regulating speed of shutter being placed underneath the case, a sufficiently deep flange all round protecting them when the camera was stood down, and at the same time effectually concealing them from view. The holes for the lens, finders, and focussing screen were covered by sliding plates of ebonite, so that the whole apparatus looked like a plain satchel or cornet case. Although this camera was provided with finders, he had not found them necessary, as with a little practice the image could be well centered on the plate, the operator being better able to judge the correct moment for exposure by watching the object than by looking at the very small screen of the finder. The President also exhibited a very handsome detective camera by Anthony, of New York, which attracted as much attention by the perfection of its arrangements as by its size, being enclosed in an alligator portmanteau as large as the ordinary traveller requires for a few days' journey. It did not materially differ in its leading features from the Scovill type, but afforded facilities for carrying a large reserve of plates. As an example of quite a different type, Mr. Taylor showed Sharland's Aurora Camera, invented by Samuels, which was truly a model of compactness. Externally, it was a small ebonised box about the size and shape of a very small cigar box, the only opening visible being that for the lens. On opening the lid the front part of the box was found to be utilised as the camera body, while the back portion contained a dozen plates, each fixed in a metal sheath, all the sheaths being in close contact. When a plate has been exposed it is simply raised by a small spring and passed over to the back of the chamber, leaving the next plate ready for exposure, the top of the chamber being covered with a flexible bag through which the plate is grasped

during the operation of changing. The bag in the specimen shown was made of india-rubber cloth, but this was liable to become torn or cut. Mr. Rouch had made an improvement by substituting soft Suède leather, which was always soft, and was also much more durable.

S. W. ROUCH said that, besides the leather bag, he had introduced other improvements in Mr. Samuel's camera, and exhibited two cameras somewhat similar to the one shown by Mr. Taylor, but with an improved shutter working immediately in front of the plate. There was also an arrangement by which fresh plate chambers, each carrying a dozen plates, could be attached to the camera. The lens was adjusted so that all objects beyond fifteen feet distance were in focus. A front and back sight afforded the means of correctly centering the picture on the plate.

W. BEDFORD showed a camera of the Samuels type constructed of an ordinary cigar box, in which he had fixed a Wray lens, behind which was a revolving shutter, made in the form of a segment of a cylinder, having a vertical wedge-shaped slit in it. This was made to pass rapidly behind the lens by means of a spring, and wedge-shaped opening allowing a greater exposure to be given to the foreground. He thought that the shutters of detective cameras should not be too rapid, as the subjects were usually near the camera. His shutter somewhat resembled that invented by Mr. Bolas, who was one of the first to construct a detective camera.

THE PRESIDENT said that Mr. Bedford's shutter seemed well adapted to the purpose he designed it for. It was, perhaps, worth mentioning, however, that the cylindrical shutter was originally invented by Professor Piazza Smyth, who used it in his small Egyptian camera. It was exhibited and described at the Edinburgh Photographic Society in May, 1866.

WALTER FEW next showed a very ingenious arrangement for detective work. He said that the very short exposures necessary could only be given during a portion of the day, while good pictures could be taken in the ordinary way, both in the early morning and the latter part of the day. In order, therefore, to be provided for any class of subject, he had constructed a cloth-covered case resembling the Scovill pattern, but slightly larger; in this he had fixed a 5 by 4 camera by Dallmeyer, with all possible movements, a Wray's rapid lens, and a Kershaw shutter; the box also contained, in the otherwise waste space, the focussing cloth, tripod head, and two dozen plates. The camera was always ready for an exposure when being carried, while if a portrait or interior was required, the camera could be instantly removed from the case and fixed on the tripod stand.

C. E. MILES exhibited the Artists' Hand Camera, which, although intended for the same purpose as an ordinary detective camera, made no attempt at concealment. It was a mahogany box with a rapid lens projecting from the front, a rotating shutter working inside the camera; the upper portion of the box was utilised as a finder, a spring hood screening extraneous light off a good-sized screen. The dark slides were of the envelope form, an external sheath drawing down, and leaving the plates inside the camera.

W. BISHOP showed a detective case which he had made for his camera. It was similar to that used by Mr. Few, but the arrangements were of a less expensive character. He used a single landscape lens with a revolving shutter made of cardboard working in front of it, giving an exposure of one-eightieth of a second. A small spirit level was let into one of the corners, so that it would serve to level the camera, whether the picture was taken horizontally or vertically. He had successfully used the camera from a railway carriage in motion, as well as from a boat and omnibus. Some very sharp and well-exposed pictures were exhibited by Mr. Bishop, as showing the efficacy of his contrivance.

T. BECK exhibited a very perfect and elaborate instrument of the Scovill type, which, while not exceeding that camera in size, had a much greater capacity for containing double dark slides, six or eight of which could easily be carried inside the case. The lens was fitted with the Iris diaphragm, which was regulated by a lever working along an index graduated to the various apertures. A Newman's shutter was fitted to the lens, and the length of exposure could be adjusted by turning the cap of the air cylinder through an opening in the outside case. If the camera was required for ordinary work, it could be fixed on a tripod stand, the shutter permitting an exposure of any length to be given, while the whole surface of the focussing screen could be seen, thus enabling the operator to properly arrange his picture.



F. BRAUN exhibited and explained Marion's Parcel Camera, which was the smallest and most innocent-looking of its class. It consisted of a simple box covered with brown paper, carrying a lens fitted with a very ingenious revolving shutter. The plates were carried in flexible bags, whence they were dropped into a groove in the camera, a suitable valve preventing the entrance of light. This form of camera was thought by the members to be less likely to be detected than any shown.

T. J. COLLINS showed a camera of the Scovill type; it was, however, fitted with a roll-holder instead of slides or plate-carriers. The shutter was of the "eyelid" pattern, opening and closing from the centre. It was so arranged that it opened and closed very rapidly, thus giving the greatest effective exposure during the time the lens was open. Focussing was effected by turning a small bronzed milled head outside the camera.

T. W. SAMUELS said that many persons knew that he had very strong views on the subject of detective cameras. He thought that a detective camera should be unlimited in its capabilities. What was wanted was an instrument which should always be ready for use, that the photographer could take up at a moment's notice charged with its complement of plates, and go forth ready for any subject he might encounter, be it a yacht race, a dark glen, or an interior. In making a detective camera, simplicity should be aimed at, so that the operator might be free to attend to his subject, instead of having to make careful adjustment and arrangements of his apparatus. In making his original detective camera he had found it convenient to place the plates in sheaths similar to those used in the changing back invented by him in 1843. He had brought two cameras, made long since, with him, and would show the ease with which the manipulations were performed. When plates were used, each sheath only wanted lifting from front to back; but if paper or films were employed, two could be placed in each carrier, back to back, and the carrier required lifting and turning round inside the bag for the second exposure. Where a focussing arrangement was deemed necessary, he thought the lever attachment the most convenient, and as he saw it on several of the cameras exhibited on the present occasion, he felt some satisfaction in being able to claim it as his own invention. Of course, in building a detective camera, every one would, as far as possible, try to utilise lenses and shutters which they already possessed; but where a shutter had to be fitted, a simple slip of metal, perforated in the centre and passing through the lens in the diaphragm slot, would be found perfectly effective; and if a thread was attached to each end of it, it could be pulled in either direction, so that it was practically always set. For centering the picture, a view meter was superior to a finder, as the operator had the advantage of looking directly at his subject, and seeing the exact amount of view included in his picture. In proof of this he would refer to the fine collection of pictures exhibited some years ago at Pall Mall by Herr Brandel. This gentleman used a light metal frame fixed on top of a simple box camera.

F. W. HART said he was glad to hear the drop-shutter in the diaphragm slot so well spoken of. Those present might recollect that some time since he exhibited a series of views taken by an amateur with such a shutter; they were marine pictures, and comprised an albatross on the wing, dolphins, &c., and testified to the extreme rapidity of this form of shutter.

In consequence of the lateness of the hour, it was decided to postpone the discussion on the cameras exhibited till the following meeting on June 5th, when there will also be an exhibition of lantern transparencies by T. E. Freshwater.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE ordinary weekly meeting was held on the 17th inst., L. WARNERKE occupying the chair. The merits of hydrokinone as a developer being under discussion,

J. TRAILL TAYLOR remarked upon the different ways of spelling the word adopted by various writers to the journals.

A. COWAN exhibited two plates, one developed with hydrokinone, the other with pyro and potash; he gave preference to the latter developer. The hydrokinone developer was very slow.

THE CHAIRMAN said a French journal considered this an advantage, as the plate could be put in the developer over night and left until the next morning.

J. B. B. WELLINGTON could get nearly twice as much detail by using the hydrokinone developer; he was able to develop a plate in about three minutes.

P. EVERETT had tried hydrokinone, and showed a negative that had taken twenty-five minutes to develop.

F. P. CEMBRANO exhibited the bromide prints referred to by him at the previous meeting, developed with hydrokinone, in which a peculiar phenomenon presented itself when the high lights were in direct contact with dark shadows. The developer used on this occasion was

1.—Hydrokinone	...	...	...	...	40 grains
Sul. soda	...	...	...	...	160 "
Water	...	...	...	...	10 ounces
2.—Washing soda	...	...	...	...	2 ounces
Water	...	...	...	...	10 "

The experiment was repeated several times, the result each time being exactly the same. Prints were also shown developed with a similar developer, but restrained with bromide; in these the phenomenon was absent.

W. J. HARRISON asked what were the characteristics of an iodide of silver emulsion.

J. B. B. WELLINGTON believed it would be found insensitive, except in the presence of free silver.

J. TRAILL TAYLOR said one of the acid developers used for wet collodion would probably bring out the image.

W. J. HARRISON believed the image was latent after exposure, but was not capable of being reduced with an alkaline developer.

J. TRAILL TAYLOR said he had known plates to be developed without either pyro or iron, the developer being a strong infusion of tea.

F. P. CEMBRANO exhibited a negative of some clouds which showed, by transmitted light, innumerable light spots all over it, having the appearance of stars; also a strip from a paper negative, on which some very fine lines appeared after development; the negative had been used in a roll holder.

THE CHAIRMAN considered the latter due to friction or shearing stress.

J. TRAILL TAYLOR remembered a paper being read some time ago by S. H. Grubb, at the Society of Arts, and some photographs being exhibited of portions of the heavens, showing stars not seen by the naked eyes; each of these stars showed a greater or lesser disc, which was considered very beautiful by the astronomers present. A question arose in his mind whether it was possible for a fixed star to show a disc, and whether it might not arise from a mechanical defect of the plate. A Daguerreotype plate would be the best for this purpose, as it would represent only stars that could be seen. To ensure accuracy in astronomical work two views should be taken at the same time of the same portion of the heavens; anything not duplicated would not be genuine, or the exposure might be prolonged, when every genuine star would have a tail.

THE CHAIRMAN, referring to spiritualistic photography, said advantage was taken of mechanical defects in a plate to endeavour to pass them off as images of spirits. On one occasion he was invited to attend a séance for the purpose of exposing some plates; he was not to look at the medium after focussing, or the picture would be spoilt. In the semi-darkness that prevailed a rather long exposure was necessary. In the negative the white cuff of the medium could be clearly traced as having passed across to the outside breast pocket, and a white handkerchief taken out and placed on the medium's head.

F. WHITE showed a four-fold stand; when opened it was perfectly rigid, each joint being bolted; it closed to 16½ inches.

THE HON. SECRETARY read a letter from the Hon. Secretary of the Photographic Convention of the United Kingdom, a copy of the rules being enclosed. The rule to which special attention was directed, was as follows:—"Every photographic or kindred society in the United Kingdom shall be entitled to appoint one delegate to serve on the general committee. Any society whose members amount to or exceed fifty in number shall be entitled to appoint one delegate for every fifty members on its roll."

THE HON. SECRETARY stated that a great many of the London and Provincial societies had signified their intention of being represented at Birmingham.

It was unanimously decided that the Association should be represented at the forthcoming convention, and Messrs J. B. B. Wellington, H. M. Hastings, and F. P. Cembrano were appointed delegates.

J. TRAILL TAYLOR said the Midland Railway had offered to reserve special saloon carriages for members attending the Convention upon two clear days' notice being given to the Company.



## DUKINFIELD PHOTOGRAPHIC SOCIETY.

At the meeting on May 15th (JOHN T. LEES in the chair), the following were elected members:—John Sampson, Arthur Sampson, J. G. Wagstaff, Dr. Robinson, H. Grundy, F. W. Cheetham, and J. W. Hadfield.

A paper was read by WILLIAM JENKINSON, followed by a demonstration, on "Toning and Fixing."

On May 19th the members had an out-door meeting to Strines, returning along the valley of the Gout to Marple, and met with some very charming bits of scenery. The party consisted of about eighteen members and friends, and fifty plates were exposed.

## Talk in the Studio.

**A READY-MADE HYDROCHINONE DEVELOPER.**—From C. Hethton Lewis, of 60, Lansdowne Street, Brighton, we have received sample bottles of a ready-made hydrochinone developer which we understand he has put upon the market. The maker does not state the composition of the developer, but it consists of two solutions, and we have found it to work satisfactorily, and with the special advantages of hydrochinone.

**TYLAR'S PAPIER MACHE TRAYS.**—From W. Tylar, of 57, High Street, Aston, Birmingham, we receive a specimen of his new series of light paper trays stamped up in one piece. A projection on the edge serves for an inscription indicating the use of the tray as "Developer," "Fixing," or "Alum." The desirability of keeping each tray to one special use should be obvious to all.

**PHOTOGRAPHY FOR SEABOARD SURVEY.**—Professor Davison, of the Coast Survey, contemplates applying photography to the whole line of the Pacific seaboard. He will select stations ten miles or less apart, and views ten to twenty miles broad off shore. The more distant portions of the view will give the land-fall and line of the crests of the coast mountains as seen seaward by the navigator. There will also be views of the headlands seen from three points: one when travelling northward, another southward, and the third when abreast of them. The islands will also be photographed from several points of approach. The work will be a long one, but the immense value of such views to navigators is beyond question, and we hope the project will be carried out at an early date.—*Anthony's Bulletin*.

**GROVE ON PHOTO-KINETICS.**—Sir William R. Grove (Justice Grove) is the author of the first popular exposition of the doctrines as to the correlation of force now generally held, and one of the early experimenters in the physical principles underlying photography; hence special interest is attached to some remarks he made while lecturing at the Royal Institution on "Antagonism." He says:—"But photography carries us further; it shows us that light acts on matter chemically, that it is capable of decomposing or forcing asunder the constituents of chemical compounds, and is therefore a force met by resistance. In the year 1856 I made some experiments, published in the *Philosophical Magazine* for January, 1857, which seemed to me to carry still further what I may call the molecular fight between light and chemical affinity, and among them the following. Letters cut out of paper are placed between two polished squares of glass with tinfoil on the outsides. It is then electrized like a Leyden jar, for a few seconds, the glasses separated, the letters blown off, and the inside of one of the glasses covered with photographic collodion. This is then exposed to diffused daylight, and on being immersed in the nitrate of silver bath the part which had been covered with the paper comes out dark, the remainder of the plate being unaffected. (This result was shown by the electric light lantern.) In this case we see that another imponderable force, electricity, invisibly affects the surface of glass in such a way that it conveys to another substance of definite thickness, viz., the prepared collodion, a change in the chemical relations of the substance (iodide of silver) pervading it, enabling it to resist that decomposition by light which but for some unseen modification of the surface of the glass plate it would have undergone, and no doubt the force of light being unable to effect its object was reflected or dispersed, and instead of changing its mode of motion in effecting chemical decomposition, it goes off on other business. The visible effect is in the collodion film alone. I have stripped that off, and the imprint remains on it, the surface of the glass being, so far as I could ascertain, unaffected. Thus in the film over

the protected part, light conquers chemical affinity; in that over the non-protected part, chemical affinity resists and conquers light, which has to make an ignominious retreat. It is a curious chapter in the history of the struggles of molecular forces, and probably similar contests between light and chemical or physical attractions go on in many natural phenomena, some forms of blight and some healthy vegetable changes being probably dependent on the varying effects of light, and conditions, electrical or otherwise, of the atmosphere."

**THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.**—On Thursday next L. Warnerke will give an account of the Photographic Exhibition recently held at St. Petersburg, with illustrations of the same.

**BEYOND ITS POWER.**—Amateur—"You said I could take instantaneous pictures with this camera. It's a swindle." Shopkeeper—"No: I said it would take groups and slowly moving objects. I did not warrant it to take a racehorse or a cannon ball." "Well, I tried it on a messenger boy and failed." "Impossible!" "I failed, and that's all there is about it." "Very strange. Had the boy a telegram in his hand?" "No, he was going to his dinner." "Oh?"—*New York Sun*.

**PHOTOGRAPHIC CLUB.**—The subject for discussion on May 30th will be "Carbon Printing." Saturday afternoon outing at Pinner: meeting at Queen's Head at 6.30; trains every twenty minutes.

## To Correspondents.

\* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

**C. SMITH.**—If you add sulphuric acid—say ten drops to each half pint—the turbidity will disappear.

**DEFAUD.**—If the photographer in question sells photographs on white opaque glass as photographs on China or porcelain, we should think he could be prosecuted for selling goods under a false description.

**L. BARKER.**—Hydrofluoric acid is the only available solvent.

**MARIA.**—1. The new edition has not yet been issued. 2. "Chlorate," not "Chloride."

**M. EDEN.**—1. The question will be fully dealt with in a future article. 2. You can make just the same profession as your rival if you can summon resolution to outrage the truth in an equally flagrant manner. Still, apart from the immorality of the thing, we advise you not, as this kind of thing disgusts the better class of customers.

**EDWARD HARNETT.**—An arrangement of the kind has been used, but the graduation of the arc is a somewhat more complex affair than you take it to be. If, however, the exposure is made while the plummet is in the position shown in your photograph, the indication will be approximately correct.

**A. J. HILDER.**—You were answered in the Correspondence column; and if we had received the additional particulars in anything like reasonable time, we should have written an article on the subject.

**DRUGGIST.**—1. If you sell lenses fraudulently marked you may, perhaps, be held liable. 2. They are not generally used now, and we take it that your only chance is to obtain some old stock from a dealer. Try Rouch, of the Strand.

**NEGATIVE.**—Apply Prussian blue—either ground in oil or water—to the back of the negative, and the result will be excellent in proportion to your skill and judgment in using the pigment.

**HAMPSTEAD.**—1. The foil answers very well, but paraffined paper is cheaper. The latter can be obtained from Kettle, 11, Kingsgate Street, Holborn. 2. We prefer to use a brush, but some persons float on the paper on the solution.

**M. CAMPBELL.**—We cannot undertake to do the work for you.

## The Photographic News.

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For Advertisement Scale see page v.



# THE PHOTOGRAPHIC NEWS.

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### PROFESSOR EDER'S ORTHOCHROMATIC COLLODION EMULSION PROCESS.

LAST week, under the heading of German Correspondence, we gave some particulars as to the important orthochromatic process which Dr. Eder has just published, and the following particulars will be of additional service to our readers.

Dr. Eder points out that, all things considered, and under correspondingly favourable conditions, collodion negatives possess undoubted advantages over gelatine negatives, especially when the negatives are to be used in connection with the photo-mechanical printing methods; and for this reason it was considered desirable to give special attention to the production of a satisfactory orthochromatic collodio-bromide emulsion.

The method now adopted has already been in use at the laboratory of the Imperial College of Vienna for some months.

As before pointed out, the emulsion is made in the following manner:—

Preparation A is made by dissolving 15 grammes of silver nitrate in 12 cubic centimeters of water, after which 90 cubic centimeters of alcohol of 95 per cent. are added. In the next place 100 cubic centimeters of plain collodion containing four per cent. of pyroxyline are mixed in with constant agitation.

Afterwards, solution B is made by dissolving 15 grammes of pure crystallised bromide of cadmium in 75 cubic centimeters of an alcoholic eosine solution containing one part of eosine colour to 800 of alcohol, after which 150 cubic centimeters of the plain collodion containing four per cent. of pyroxyline are added.

With regard to the eosine colour to be used, it should be borne in mind that as some eosine colours have more tinctorial strength than others, it is occasionally sufficient to use an alcoholic solution as weak as one part in two thousand. Moreover, eosine colour having a yellowish tinge is preferable to that having a bluish tinge. That sold as Phloxin answers very well.

Having thus prepared A (the argentic collodion) and B (the bromide collodion), the next step is to mix them in the dark room. For this purpose the bromide collodion is added, a little at a time and with agitation, to the silver collodion, until about 5 or 10 cubic centimeters of the bromide collodion remain unadded. At this point it is necessary to test if the emulsion still contains excess of nitrate of silver; a small excess of this salt being an essential condition for satisfactory working, as the eosine compound of silver is then formed.

To test the emulsion, a few drops are poured out on a glass plate, allowed to set, and a little solution of yellow

chromate of potassium is allowed to fall upon it. If a great excess of silver nitrate is present, a bright cherry-red spot of chromate of silver is formed, and a little more of the bromide collodion must be added, after which the test must be repeated. The right point is reached when only a faint orange spot is produced when the chromate solution comes in contact with the set emulsion. It is to be noted that an emulsion with a somewhat considerable excess of silver nitrate has a tendency to produce fogged and marked plates, although such plates are very sensitive; but when the excess of silver is very small, not only is the sensitiveness much less, but the plates are far less orthochromatic than they otherwise would be. Should too much of the bromide collodion have been added, the proper excess of silver must be restored by cautiously adding a little of the following solution:—Nitrate of silver, 1 gramme; water, a few drops (*i.e.*, sufficient to dissolve the silver nitrate); alcohol, 10 cubic centimeters. Emulsions containing a considerable proportion of colouring matter will bear a larger excess of silver nitrate than emulsion containing only a small proportion of eosine.

It is desirable to allow twenty-four hours for the emulsion to ripen, but it can be used immediately it is made. The plates should be bordered with india-rubber solution, coated with the emulsion in the ordinary way, and soaked in water as soon as the film has set; the soaking being continued until there is no longer any appearance of greasiness. It is best to expose the plates while wet, as if once dried they lose in sensitiveness. The sensitiveness may, in the former case, be estimated as double that of an ordinary wet collodion plate developed with iron, and most pictures can be satisfactorily photographed without a yellow screen, although in the case of very bright blues it is desirable to use a screen of glass coated with aurantia collodion.

For development one may use either oxalate of iron or pyrogallol developer, but the developer given on page 328 of our issue of last week may be mentioned as a preparation which has been some time in use with satisfactory results.

Orthochromatic emulsion prepared as above described will keep good for a period of from eight to fourteen days, after which fog sets in. If, however, it is desired to prepare an emulsion for stock, it should be made with a slight excess of bromide; but immediately before use the necessary quantity of the silver solution already referred to must be added.

On page 328 of our last issue will be found some notes about the washing and precipitation of the emulsion, if this should be considered desirable.

The process, as above described, is a perfectly reliable one, and merits the attention of all who have to reproduce coloured objects.



## FLASH LIGHTS FOR PHOTOGRAPHY.

The production of an artificial light suitable for photographic portraiture has lately occupied a good deal of attention, chiefly because of the ingenious suggestion recently made to ignite magnesium powder by means of gun-cotton or gunpowder, and because of the very considerable fall in the price of magnesium.

The successful use of magnesium in this form has led to the introduction of special lamps for its combustion in puffs, and there is, perhaps, a sufficient amount of novelty in the means used to justify the term, "*new flash light*," as applied to these methods.

The old and well-known method of getting a highly actinic light by burning bisulphide of carbon in nitric oxide gas has recently been described by Dr. Bolton, of Ohio (p. 273 of present volume), and this method of producing light merits further experiments.

The chief objects of the methods recently brought forward are to get an effective light that shall be cheap and portable, and, if possible, so brilliant that it may enable a photograph to be taken in a fraction of a second. As neither an extensive system of gas burners, nor the electric light, can fulfil these conditions, we must apparently fall back upon special combustibles—sulphur and magnesium being the two substances that most readily lend themselves for this purpose—and by the use of oxygen or oxygen-containing substances, such as nitre or potassium chlorate, the luminosity of the combustion may be considerably increased.

In 1875 John Spiller described, though not as a novelty, the combustion of sulphur upon the surface of molten nitre (potassium nitrate). In the previous year, Delachancé and Mermet constructed a lamp for burning bisulphide of carbon with nitric oxide gas, that a steady flame might be obtained instead of the mere flash produced by burning a jar of the mixture. It is worth while reminding our readers that although this mixture has been burnt hundreds of times without accident, dangerous explosions of it have taken place.

A. Riche and C. Baily made some experiments seeking a method of eliminating the possibility of accidents with proper precautions in using this light, and they found that by directing a jet of oxygen upon molten sulphur, a more photographically active light was obtained, and this without the possibility of explosions. They found that the light so obtained produced in a given time nearly twice as much effect upon a dry plate as the light from a magnesium lamp.

In the *News* for 1875 (p. 367), a contributor suggests the burning of phosphorus upon a pressed down mass of dried nitre, and the heat of combustion melting the nitre as it is required. In this case fumes of solid phosphoric anhydride are given off.

Many pyrotechnic powders have been suggested, and used from time to time; but we will only refer to one to be found in the *News* for 1883 (p. 104), given on the authority of Traill Taylor. It contains potassium chlorate, sulphide of antimony, sulphur, and magnesium dust. Concerning it, Mr. Taylor says:—"A small portion of this emits, when burned, a flash not only of intense brilliancy, but of exceedingly short duration. An engraving that was in a state of motion during the burning of a quantity so small that could be piled upon a twenty-five cent piece (say a shilling) yielded a negative (wet plate) which was found on development to be quite sharp and fully exposed." A mixture somewhat similar to this was "discovered" again a year or so ago.

Other cheap and portable lights for photographic purposes have been proposed from time to time, most of them old, though called new. We have not attempted to catalogue all the suggestions in this connection.

## IDENTIFICATION BY PHOTOGRAPHS OF THE HAND.

SEVERAL times we have referred to hand-markings as

affording a means of identification, which is often of greater value than ordinary photographic portraits, the markings being not only characteristic of the individual, but remarkably persistent; and this matter was, among others, treated of by Francis Galton, in an interesting lecture delivered on the 25th ult., at the Royal Institution.

The Lecturer dealt with the various anthropometric methods for identification, and in the course of his remarks said that individuals differ in a measurable manner, in so many respects, that a person may be identified with considerable precision by a statement of his measures. The curious variety of imprints made by inked finger-tips admitted of being classed and catalogued. They seemed to be singularly persistent, judging from four specimens that were exhibited of the digit marks of Sir W. Herschel, made in the years 1860, 1874, 1885, and 1888 respectively. Though there was a difference of twenty-eight years between the dates of the first and the last, no difference



could be perceived between the impressions. Sir W. Herschel had made great use of digit marks for purposes of legal attestation among natives of India. Prisoners were now identified in France by measurements of their heads and limbs, according to the ingenious method of M. Alphonse Bertillon. The measures of each prisoner were all entered on the same cards, and the cards were classified according to the successive measures they contained, just as words were arranged in a dictionary according to their successive letters. The classification did not take more note of the measures than by placing each in the category of large, medium, or small, as the case might be. Thus one measurement gave rise to three possible groups, two to nine, three to twenty-seven, and so on. The lecturer exhibited the rough working model



of an apparatus he had contrived that could select by a single movement those cards out of many hundreds whose measures corresponded within any desired limits with those of any given person. The profile of a face, he continued, could be measured with much precision on the sharp outline of a photograph. The observed differences in feature were severally small, but they were numerous and more independent of one another than the lengths of the various limbs. One of the objects the lecturer had in view in the present inquiry was to discover measurable and independent peculiarities that would assist in hereditary investigations. He had some hope that by noting many of these it might be possible to trace in every person clear evidence of his parentage and near kinship.

As an illustration of the perfection with which the markings of the hand may be recorded by photography, we here introduce an impression from a block made by W. C. Dallas of a negative he took some months ago. In order to obtain a satisfactory register of the markings the light should be somewhat oblique, but not too oblique.

Not only those who are concerned with the means of identification, but also any persons who study chiromancy, should take interest in records such as we now present to our readers.

#### NOTES FROM NEW YORK.

**BOSTON EXHIBITION—CLOCK-SPRING DIES—NEW DETECTIVE CAMERA—THE "CELLULOGRAPH," AND LANTERN SLIDE MAKING.**

*Boston Exhibition.*—The latest information concerning the Boston Exhibition, now in progress, and which terminates on May 12th, is that it is quite a success, attracting considerable attention in Boston and vicinity, and is very largely attended, something like 800 per day. Lantern exhibitions occur every evening, which prove quite an attractive feature. A neat and comprehensive catalogue is issued, showing 320 separate frames as having been entered, also 18 transparencies and 26 lantern slides. The New York Society has 16 exhibitions, Philadelphia Society 13, the Boston Club 32, Providence Association 1, Baltimore Amateur Society 1, Lowell Amateur Association 1, and 15 miscellaneous and 3 foreign exhibits, two of which have taken diplomas. The catalogue also shows that about 30 preferred the pyro and potash developer, 8 the pyro, potash, and soda developer, 41 the pyro and soda developer, 8 pyro and ammonia, 5 oxalate and iron, and 4 hydrochinon, with either potash or soda as an alkali. For lantern slides the ferrous oxalate developer is mostly used, but two or three exhibitors prefer hydrochinon. So it will be seen that the adherents of pyro and potash and pyro and soda seem to be very nearly equal, with a majority slightly in favour of the soda. I give you a list of the awards, according to classes, announced on Monday the 7th inst. :—Class 1 (best landscape larger than 6½ by 8½), Professor H. A. Rowland, Baltimore, Md.; also for Class 14 (probably a marine view), 2 diplomas; Frank M. Sutcliffe, Whitby, Eng., 2 diplomas; one in Class No. 2 for best landscape, 6½ by 8½ or under, and one in Class 8 (probably figure study); 2 diplomas to Horace A. Latimer, Boston, Mass., Class 3 and Class 15, latter best set of lantern slides; 2 diplomas to George B. Wood, Philadelphia, Pa., one in Class 6 and one in Class 8 (probably figure study); one diploma to Miss Annie L. Richards, Boston, Mass., for Class No. 11 (probably interiors); David Pepper, Philadelphia, Pa., Class 13 (probably instantaneous work); one diploma to John C. Lee, Boston, Mass., for Class 16; one diploma to H. H. Suplee, Germantown, Pa.; one diploma to Dr. K. K. Andrews, Cambridge, Mass., Class 18; and one diploma to Miss Catherine Barnes (special Ladies' Class), making fifteen diplomas in all, or about twelve less than were issued last year at the New York Exhibition. The work is fully equal, if not in some respects superior, to that shown in New York. At the regular meeting of the New York Amateur Society, on the 8th inst., Mr.

Edward Leaming read a valuable paper on "Printing and Toning Plain Paper," and Mr. F. C. Beach read a paper on—

*Clock Spring Dies for Lantern Slide Mats*, by Jos. P. Beach, the following being an extract:—"The costly nature of lantern slide mats as now supplied by the various stock dealers has led me to devise a simple plan by which an amateur may make hundreds of mats at cost of a dozen, when you have to buy them. And as the mat very often has a great deal to do with the proper setting off the picture, it is well for the amateur who is interested in this subject to provide tools for producing varied sizes and shapes to fit any given picture. My method consists in taking a block of hard mahogany, apple-tree or pear-tree wood with the end grain upwards, and about an inch and a half thick, and as large in size as an ordinary lantern slide plate, and marking on the surface with a lead pencil the form and size of the mat you want, but, perhaps, a trifle smaller than an actual size. Then with proper tools, chisels and files, I take off the block a half inch in depth of the wood, until it assumes the oval or square marked out. I back up the mahogany block with half-an-inch of a softer kind of wood, securing it by screws, and bore a hole through the centre three-eighths of an inch in diameter. This permits the air to reach the centre. Around the wood form thus made I bend an ordinary clock spring, which can be bought very cheaply, and is usually about ¾ of an inch wide, and secure it to the wood by screws. I prefer to do this with the aid of a vyse, putting in one screw at a time until the circuit is completed. The pressure of the vyse holds the steel against the wood in place until it is fastened by the screw. Before the steel is bent around the wood form, holes for the screws should be punched with a blunt-faced punch where needed. The steel should be put on a piece of hard wood or a block of solder. If the spring is too hard to punch a hole through it, then take out the temper by heating in a stove, and cooling by throwing into a bed of ashes. It will be seen that the thickness of the spring, ½ of an inch, will be too great to cut the paper clean and sharp, hence I advise filing down one edge before it is attached to the block, finishing with a very fine file. In putting it on the block it is necessary that the ends come close together; they may be allowed to lap a trifle, which can be afterwards filed away. I generally use a pair of plyers and a hammer to partially shape it around the block. For making square shapes it is better to obtain thinner steel than the clock springs, for if they are used, the temper of the steel has to be removed. After the holes are punched out they should be reamed a little. Special thin steel can be obtained from most dealers in machinist tools and supplies, while the old worn-out clock spring can be bought for a song from any large clock company. To cut out the mats I simply fold up a sheet of paper 8 by 10 in size until it is four layers in thickness, and of the conventional lantern size pattern, then place it over the steel die; upon the paper I put a piece of mahogany wood with the end grain in contact with the paper, and then by light quick taps of the hammer on the wood, the mats are quickly made, and your die is still ready for hundreds more. The hard wood can be bought from dealers in engravers' and printers' blocks at the corner of Dutch Alley and Fulton Street."

Mr. Beach also exhibited an improved *Detective Camera*, the invention of Mr. J. H. Ford, of N.Y. City, who is also the proprietor of the *Concealed Camera*. The point of interest about the camera is that it is compact, light, easily and quickly operated, simple and durable, and inexpensive. It makes pictures about two and one-half inches square, and somewhat larger in size than the concealed or Vest Camera. The negatives are well adapted for making lantern slides by contact. The lens is double, and about as large in diameter as a good-sized button. It is secured to a hemispherical nickel-plated metal front, which is screwed to a light square wood frame, adapted to



receive a delicate single plate, plate-holder having a slide and everything complete. The lens is the success of the camera, since it works at a set focus, rectilinear and wide-angle combined, and cuts near and distant objects perfectly sharp. No ground-glass is required. Operating within the hemispherical front of the camera is a hemispherical shutter having an aperture equal in size to the diameter of the lens. The shutter works in a vertical plane, and is propelled by a small coiled wire spring on its axis outside. This construction precludes the possibility of any light leaking by the shutter. It is set by moving a small crank attached to the axis. The release mechanism is very simple, consisting of two rods so arranged that when one is pushed downward with the finger, it carries the other rod with it, allowing the full sweep of the shutter for an instantaneous exposure. For a time exposure, one rod is pushed downward, releasing the shutter, which revolves a quarter of a revolution until stopped by the second rod; the exposure is then made, and when the rod is depressed the shutter completes the latter half of its revolution, closing the lens. A flat tension spring, regulated by a screw, presses upon the shaft of the shutter, which easily regulates the speed. Ordinarily the camera can be carried in the palm of the hand, allowing the lens-tube to project through the fingers; it is then concealed, but the one shown was enclosed in a neat black walnut box with an ornamental handle, and could carry two or three extra plate-holders. Excellent specimen negatives and prints were passed around, showing clearly the value of the apparatus. By using square plates, the inventor claimed the expense of working the apparatus was reduced. Round pictures could be made on the square plates if desired. The general get-up of the camera, its simplicity, and neatness, and compactness attracted considerable attention, while the low price at which it is to be supplied greatly added to its probable utility.

Following this, he explained and exhibited a new style of photograph called the "Cellulograph," which he said was patented. The sample shown had been given to him by the owner of the process, Mr. C. Theo. Cain, of Owensboro, Kentucky. The principle of the process was the transfer of a collodion film to a sheet of celluloid. The directions Mr. Cain gave were as follows:—Take a sheet of plate glass perfectly smooth and slightly larger than the intended picture, and put around one side or face of it a safety edge about one-quarter to an eighth of an inch wide, of a solution made of water (4 ounces) in which the white of one egg is placed. When the edging is hard and dry, flow the plate over with collodio-chloride emulsion, which can be purchased ready prepared at most any manufacturer of photographic supplies. As soon as dry, place the plate, film side downwards, in a horizontal position in a fuming-box about eight or ten inches above the saucer containing ammonia, and let it remain there from three to five minutes. The prepared plate is next put in a printing frame behind a negative, in the sun or shade, and printed the same as silver paper, care being taken to print a little darker than is desired. The operation can be observed by looking through the back of the sensitive plate when the back of the frame is opened. After printing, wash the plate for three or four minutes under the tap, and then tone with the following bath:—

Gold solution (strength, 1 grain to the ounce of water) ... .. 1 dram  
Neutralise acidity with carbonate of soda until red litmus paper turns blue, then add  
Water ... .. 8 to 10 ounces

The picture on the glass in this solution will tone very gradually, first from a red colour to brown, and then to purple. When the right tone is obtained, remove the plate, and wash in or under running water for five or ten minutes, then fix in a very weak hypo bath, one ounce of hypo to fifty ounces of water. Next wash under the tap for a few minutes, or in three or four changes of water for

about an hour. The plate may then be set up to dry spontaneously or by heat. This is in reality a transparency on glass. To transfer the film from the glass plate to the celluloid plate is the next process. The celluloid plate is flowed over with a solution of plain collodion (5 grains of cotton to the ounce), this is allowed to set and soak somewhat into the surface of the celluloid, then the coated surface is again covered with a camphor solution made as follows:—

Alcohol ... .. 1 ounce  
Camphor ... .. 5 grains

And a little excess is left on the surface, so that when the glass plate is pressed upon the celluloid surface, the camphor solution will embed its film. To aid in the transfer Mr. Cain has a special frame made; the celluloid plate, after being coated, is put in it, then the glass plate, picture side down, is placed in contact with the celluloid while the surface is moist and is clamped in contact therewith under pressure by suitable devices. To avoid air-bubbles when placing the glass in contact with the celluloid, first let one end of the glass plate strike the celluloid, then with a slow but gradual continuous motion, lower it until it is in perfect contact all over. In about three-quarters of an hour the celluloid sheet and plate may be removed from the pressure of the frame, when it will be found that the glass, by loosening one part of the albumen edge, will easily separate from the celluloid, leaving on the latter the positive picture, apparently highly burnished, and resembling very closely in finish an ivorytype. If left longer than three-quarters of an hour, the picture will separate itself. The celluloid sheet bearing the picture, being damp, is apt to curl up some, but by putting it under pressure until it is thoroughly hardened it will dry flat. Should it at any time show a tendency to curl afterwards, it may be flattened by passing over the back a moderately warm flat iron. If it is desired to put round the picture any embossed or ornamental border, it may be easily done by damping the celluloid sheet slightly, and placing it between suitable dies. A slight pressure will mould it to any desired form. The celluloid sheet may be mounted on still heavier sheets or on cardboard by using a solution somewhat stronger in camphor than that previously mentioned, and also more pressure. The specimen Mr. Beach showed presented a very pleasing appearance. When the simplicity of the process becomes known there will doubtless be a large number of amateurs and professionals who will be glad to utilise it. The picture can be readily coloured. Samples of celluloid without the picture, and a glass transparency ready to be transferred, were shown.

Interest in *Lantern Slide Making* in the Society is to be stimulated, as is shown by the following extract of the committee's report made by its chairman, Mr. Beach:—"The committee desires also to say that it has completed arrangements for the loan of the Society's lantern slides to members desiring to give private exhibitions at home. Application should be made a day in advance to any member of the committee. The committee has been informed that the Society, through the Board of Directors, has ratified the rules adopted at the Philadelphia Conference in February, creating 'The American Lantern Slide Interchange,' and has also been informed by Mr. Geo. Bullock that this action organises the Exchange, ours being the fifth society to ratify it. The Boston, Chicago, Pittsburgh, and St. Louis Associations are said to have withheld their assent, though one or two may reconsider. One of the advantages of the new Exchange will be that no slides will be permitted to be circulated except those properly mounted, and previously tested by the Board of Managers. Under the rules, this Society is required to have ready by October 1st next, one hundred suitable slides, which, after exhibition before the Society, will be sent to the Board of Managers, who will test them and return to the Society any that appear in its judgment to be defective. The balance will then be sent the rounds of



different associations, and at the end of six or eight months will return again to the Society. So far as this committee is concerned, it begs to submit the following plan. Let fifteen or twenty members interested in slide making submit to it, before September 1st next, ten or fifteen slides each; the committee will select therefrom one hundred for the Exchange; these it asks shall be loaned to it by the contributing members for nine months. At the end of that period, the committee will return the slides to the contributing members, with the request that such slides as have been selected for shipment abroad to the London Camera Club be donated to the Society, or in lieu thereof, duplicate slides equally as good furnished. By this method no member is compelled to give up any slide he may furnish. In thus donating slides to the Society for the purpose mentioned, the Society gets back in return as many slides of foreign scenery and subjects, which become eventually its permanent property."

A field excursion for our "Decoration" holiday, May 30th, is talked of.

SULPHITE.

New York, May 10, 1888.

## BROMIDE PAPER FOR REPRODUCING MAPS, PLANS, ETC.

BY W. M. ASHMAN.

### SECOND ARTICLE.

IN the latter part of the previous article it was pointed out that negatives, in order to yield satisfactory results, should be vigorous—namely, such as would yield bright silver prints with a little error on the side of density. The finest lines should not only be distinctly visible, but free from anything beyond the merest deposit, while masses of white ought to be sufficiently dense to ensure the proper representation of these parts in the prints. Too much exposure prevents this quality being obtained in negatives, and general flatness and covering up of the finest details are the usual characteristics produced. Upon the other hand, insufficient exposure may, as a rule, be recognised by poorness of image and very clear lines; intensification of such defective negatives does not give the printing value that they would have possessed had the correct exposure been given and development carried to the full extent.

Purchasers of bromide paper, whether in packets or rolls, are supplied with printed instructions by the manufacturers, who ought to be the best judges as to whether the formulæ therein contained have been well chosen. I am afraid it is seldom adhered to, however, so strong is the passion for experimenting in this direction. In treating of the details as we proceed, the ferrous oxalate developer will be selected, since, in a more or less modified form, it appears in every set of instructions we have seen. Suppose negatives 12 by 15 inches are to be printed, cut sheets of this size can be obtained in packets of a dozen pieces; or a strip 15 inches by 24, cut from a roll, will, of course, when divided, be just as convenient if two prints are wanted; indeed, many prefer working from rolls, as with ordinary care no deterioration takes place by keeping it in stock for a very long time.

The usual plan of proceeding, when printing in contact with negatives of the dimensions of the required print, is to employ a larger size printing frame supplied with a glass bed, and let the front be completely covered with ground glass. Tracing paper, tissue, or other diffuser, may be strained over at a few inches' distance from the glass surface, the object being to filter the light through a medium capable of diffusing, and as far as possible equalizing, the illumination. The negative to be printed should be dusted, and any gelatine, varnish, or extraneous matter adhering to the back removed. The negative is then laid down upon the glass bed of the printing frame, film upward, when it is ready for the reception of the paper. From this stage forward the work must be carried on in a non-actinic apart-

ment, the dark room being usually requisitioned for the purpose. This condition provided, the sensitive paper is adjusted, and the pressure frame closed. Assuming, for the purpose of this article, that a printing frame arranged as described contains a negative, and bromide paper of the requisite size pressed in close contact therewith, and no light other than that of a non-actinic character has reached the sensitive surface, all will then be in readiness for making an exposure. The time required to effect this properly may range from a second or less to several minutes, according to the kind of light employed, the distance it is situated from the negative, and the degree of opacity and colour of the latter. These conditions being somewhat variable, it is advisable not to use diffused daylight for any but extremely dense negatives, and even then an exposure of one second, made to the light of an ordinary room, may prove too much.

Artificial light is far more under control, and used, as a rule, for all sorts of negatives. The writer employs a No. 6 Bray gas-burner. In determining the distance a negative should be exposed from such a method of illumination, it should be remembered that an intense light is more effective in the case of a dense or yellow negative, and *vice versa*. A thin, grey, quick-printing negative yields more vigorous bromide prints when exposed a long distance from the flame; therefore, as we are dealing with negatives possessing sufficient force to properly reproduce maps and plans, a medium distance of twenty inches or thereabouts may with impunity be chosen, provided the frame during exposure be kept in gentle motion in order to equalise as far as possible the distribution of the light. Negatives of drawings, &c., which have been carefully illuminated, ought, during printing, to be supported in a vertical position; when defective, however, from the cause alluded to, or unevenness of the coating of the plate, some benefit is derivable from supporting the frame during exposure at a slight inclination, so that the most dense parts are closer to the light. Thin portions may also be protected by shading with an opaque substance during a period of the exposure. With daylight, this convenience would hardly be practical. After the exposure has been made, and the apartment again rendered non-actinic, the paper is removed, and placed in a tray of cold water to soften, during which time it is customary to prepare the developer. The writer keeps saturated solutions of ferrous sulphate and potassium oxalate always ready for use, the former being acidified with sulphuric acid, and the latter with oxalic acid, and they are used for this purpose in the proportions of one part of iron added to five parts of oxalate, to which one minim per fluid ounce of a ten per cent. potassium bromide solution is added. With papers now in the market, development under the circumstances named would be complete in less than five minutes, when the print should be washed in two or three changes of acidified water (one ounce of acetic acid in a pint of water), rinsed in ordinary water to thoroughly eradicate the acid, and put into the fixing bath. One part of sodium hyposulphite dissolved in five parts of water is the strength generally employed for this purpose, but the writer prefers the addition of one part of common salt and a little sodium carbonate as well. Complete fixation should take place in twenty minutes, but no harm is at all likely to result by continuing the process for half-an-hour, provided the fixing bath be neutral. Acidity is apt to cause a separation of sulphur, and consequent reduction of a yellow deposit upon the surface of the print. Copious washing follows, and more than one well-known maker advocates sponging the prints afterwards with acidified water, and subjecting them to a second washing to remove the acid which the paper has absorbed. The prints are next placed in blotting-sheets, then dried spontaneously, cut to the exact size required, and mounted, if so desired, upon canvas, cardboard, or other support.

Provided the foregoing precautions have been observed, prints sufficiently strong in black and white for most



purposes ought to be the result. An increase in the proportion of iron recommended would tend to produce a grey image and softness generally; whereas an increase of potash or bromide slows development, and, in large excess, is productive of intense blackness and harshness of an undesirable character. The full force of a developed image is not apparent until after fixation, so that some little allowance should be made for this continuing action after visible development has been stopped. Prints which, after development, have not been soaked a few minutes in more than one change of acidified water, are liable to exhibit a brown stain in the white portions when dry. This colouration, which is due to the iron developer being left in the paper, can in most instances be cleared away by soaking the print in, and sponging the surface with, water acidified of the proportions already named.

After such treatment the prints require a couple of hours' washing to remove the acid. Yellow stains are the result of imperfect fixation, or, as above stated, a deposition of sulphur from the use of an acid fixing solution. Prints of a satisfactory character can be easily made by giving attention to the foregoing details, and that with a minimum of trouble combined with considerable dispatch. They should be dried spontaneously, and, if they are to be mounted, the backs only should be damped with a moist sponge. Strong starch paste is next applied, and the prints rubbed down upon cardboard or other support. When quite dry there is no difficulty in modifying or removing any portion of the print by means of a scraper or any other abrading substance. More additions may, with great ease, be made whenever requisite, owing to the admirable manner in which the surface of these bromide prints admits of modification. At our military establishments, office of works, and other centres, it is possible to imagine any number of uses for bromide paper as an agent for obtaining reproductions, whilst architects, surveyors, designers, and others, would, if they were acquainted with the usefulness of the process, avail themselves of its services far more than has already been the case, for in it they would discover some of the advantages that photography of to-day is enabled to offer business men, and, further, that prints so produced are presumably permanent.

## Review.

**EX VOTO.** An account of the Sacro Monte or New Jerusalem at Varallo-Sesia. Illustrated by numerous collotypes. By Samuel Butler. Price 10s. 6d. (London, 1888: Trubner and Co., Ludgate Hill.)

ALTHOUGH, perhaps, comparatively few persons will completely share the author's immense enthusiasm with regard to the Mount of Calvary at Varallo, there are very many who will welcome the book now before us, and be glad to have excellent reproductions in permanent photography of the interesting objects at Varallo.

The collotypes are done by Maclure and Macdonald, of Glasgow, and are excellent; indeed, collotype shows at its best in reproducing works of art.

## CAMERA CLUB.\*

THE HON. SECRETARY having read the resolutions agreed to at the previous meeting, and having given communications received since that occasion,

The Rev. F. C. LAMBERT proceeded to refer to points which he considered worthy of attention. He considered it a most important matter, but it was one which was certainly keenly contested, that when once a picture had been adjudged worthy of distinction it should no further be allowed to compete.

Mr. GRIMSHAW thought that medalled exhibitors would not send their pictures unless they were open to enter them for competition, as in exhibitions of a different character, he would suggest the

addition of a champion class, in which the distinguished picture<sup>s</sup> could be brought together in competition. He had mentioned this<sup>s</sup> suggestion to Mr. H. P. Robinson, when at Tunbridge Wells a day or two previously, and he had expressed approval of such a regulation.

Mr. DAVISON remarked that this way out of the difficulty was also suggested in some of the replies received from societies and from individual exhibitors. He thought, however, that it might possibly be found that this would oftentimes result in a very limited class being formed.

Mr. STURMEY pointed out that in that case the judges, as already provided for in Resolution No. 7, could withhold an award altogether.

After further discussion, the following resolution was adopted by a large majority:—Resolution No. 11: "That when once a picture has gained a medal it be not again admitted to competition except in a class specially set apart for pictures previously awarded a prize."

The next resolution was unanimously agreed to:—Resolution No. 12: "That in cases where pictures exhibited are the work of more than one operator, the same be notified in the catalogue."

On the next point an animated conversation took place, a proposition being put forward by Mr. Lambert, and supported by several speakers:—"That there be no classification of pictures whatever."

To this an amendment was proposed by Mr. S. G. B. Wollaston:—"That classification by subject is generally desirable."

On a vote the amendment was carried by a very slight majority.

Resolution No. 13: "That classification by subject is generally desirable."

Upon this Mr. Lambert proposed, and the resolution was carried: Resolution No. 14: "That a stated limit be imposed upon the number of pictures eligible to be sent into each class by one exhibitor."

A proposition was put forward that it would tend to the improvement of the work done by photographic exhibitors if the authorities organising exhibitions would suggest certain set subjects for illustration, giving full notice of the subject; but this was allowed to drop as being more fitted for private arrangements among the members of a society.

The subject of charge for wall space as opposed to charge per frame was also set on one side as being somewhat outside the scope of the meeting, and a matter which would be best settled by supply and demand.

The meeting terminated with the proposal (cordially made by gentlemen present from other societies) of a vote of thanks to the Camera Club for bringing forward the subject, and for making convenient arrangements for its adequate discussion and ventilation.

Below is appended a statement showing the opinions expressed by the provincial societies, and by well-known exhibitors, in answer to the circular sent out:—

### Cardiff Amateur Photographic Society.

Length of notice.—Spring, three months; autumn, four months.

Previous announcement of judges.—No, might bias exhibitor.

Judges for artistic or technical knowledge.—Same judges.

Class into sizes or subject, or technical and artistic.—Certainly, according to size and subject.

Awards or no awards; system of first, second, and third prizes.

—Three prizes, first, second, and third, in every class.

Practice of frequent exhibition of same picture.—Objectionable.

Limit of number of pictures or wall space for each exhibitor.—

Unlimited, and at discretion of committee.

How much to be done by the exhibitor.—All except preparing plate, paper, mounting, framing.

General remarks.—Apparatus, plates, &c., to be practically tested, and plates to be selected from dealers. Hanging committee to be non-exhibitors, and appointed by council.

### Coventry and Midland Photographic Society.

Length of notice.—As long as possible.

Previous announcement of judges.—Not before entries.

Judges for artistic or technical knowledge.—Art and science equally represented.

Class, in sizes or subject, or technical and artistic.—According to subject, and in two subdivisions as to size.

Awards or no awards; system of first, second, and third prizes.

—First, second, and honorary mention at judges' discretion.



Practice of frequent exhibition of same picture.—Only one first prize, except in a class specially arranged for medalled work.  
 Limit of number of pictures or wall space for each exhibitor.—Should be left to the exhibition committee concerned.  
 How much to be done by the exhibitor.—Exposure, developing, printing, toning, mounting, and retouching.  
 General remarks.—Champion class suggested for first medal pictures.  
 Exhibition fixture-list suggested in photographic press, and that greater prominence be given to apparatus.

*Dartmouth Amateur Photographic Society.*

Length of notice.—Three months  
 Previous announcement of judges.—Names of judges should be announced.  
 Judges for artistic or technical knowledge.—Judges for each section.  
 Class ; in sizes or subject, or technical and artistic.—Subject and sub-division under and over whole plate.  
 Practice of frequent exhibition of same picture.—Unanimously against repeated exhibition of same medalled picture.  
 How much to be done by exhibitor.—All, from exposing to mounting.

*Derby Photographic Society.*

Length of notice.—Not less than months.  
 Previous announcement of judges. To be announced at same time or exhibition circular. Five in number.  
 Judges for artistic or technical knowledge.—Judges for each section.  
 Class in sizes or subject, or technical and artistic.—According to subject.  
 Awards or no awards ; system of first, second, and third prizes.—First and second judges to have power to withhold either or both of these. This to be announced on circular.  
 Practice of frequent exhibition of same picture.—A picture once medalled not to compete again.  
 Limit of number of pictures or wall space for each exhibitor.—Have a limit depending on available wall space.  
 How much to be done by the exhibitor.—Exposure, development, retouching and printing.  
 General remarks.—Judging : separately by system of marks, and take average.

*Dundee and East of Scotland Photographic Association.*

Length of notice.—Not less than six months.  
 Previous announcement of judges.—Either at opening of exhibition or before if possible.  
 Judges for artistic or technical knowledge.—The majority of the judges should have a technical knowledge of the art ; the minority may be appointed for artistic quality.  
 Classes in sizes or subject, or technical and artistic.—According to subject.  
 Awards or no awards ; system of first, second, and third prizes.—If prizes at all, then first, second, and third, as only best work can be got for exhibition by offering prizes.  
 Practice of frequent exhibition of same picture.—Say, two years after first exhibit.  
 Limit of number of pictures or wall space for each exhibitor.—Do not limit.  
 How much to be done by the exhibitor.—If amateur : developing, printing, and retouching. If professional : his staff ; enlargements, his staff alone.  
 General remarks.—Charge for wall space, 2s. 6d. or 5s. for stated space, and a small charge for square foot afterwards. No advertising medals.

*Edinburgh Photographic Society.*

Length of notice.—Three months.  
 Judges for artistic or technical knowledge.—Exhibitors should have a voice in the selection of judges.  
 Class : in sizes or subject, or technical and artistic.—Artistic and technical excellence should be distinguished.  
 Awards or no awards ; system of first, second, and third prizes.—First, second, and third.  
 Practice of frequent exhibition of same picture.—Not objectionable.  
 Limit of number of pictures or wall space for each exhibitor.—Depends on circumstances.  
 How much to be done by the exhibitor.—At least make and develop the negative.  
 General remarks.—No charge for wall space, if possible.

*Gloucester Photographic Society.*

Length of notice.—Not less than three months.  
 Previous announcement of judges.—Committee divided.  
 Judges for artistic or technical knowledge.—For both.  
 Class in size or subject, or technical and artistic.— $\frac{1}{4}$  plate,  $7\frac{1}{2}$  by 5 and under ;  $7\frac{1}{2}$  by 5 to 10 by 8, and above 10 by 8.  
 Awards or no awards : system of first, second, and third prizes.—First and second only. Extra at discretion of judges.  
 Practice of frequent exhibition of same picture.—Medalled pictures, one season only.  
 Limit of number of pictures or wall space for each exhibitor.—No limit.  
 How much to be done by the exhibitor.—In amateur class the whole.

*Liverpool and Birkenhead Photographic Association.*

Length of notice.—Six months at least.  
 Previous announcement of judges.—No need to announce beforehand.  
 Judges for artistic or technical knowledge.—Five in number : one painter, one professional, one local judge.  
 Class : in sizes or subject, or technical and artistic.—Subject and classes : a separate class for every dimension.  
 Awards or no awards ; system of first, second, and third prizes.—Three for large classes, for others two.  
 Practice of frequent exhibition of same picture.—Medal pictures not to compete.  
 Limit of number of pictures or wall space for each exhibitor.—No limit.  
 How much to be done by the exhibitor.—Exposure, developing, printing, retouching, but not mounting.  
 General remarks.—Charge for wall space, 2s. 6d. per square foot.

(To be continued.)

## Notes.

Photographers in Canada are complaining bitterly of the special protective arrangements with respect to dry plates, and, unless we are misinformed, the circumstances under which a special high impost has been made require investigation. We will probably say more next week.

Newly-established papers are bound to do something to attract attention. The strangest notion yet hit upon is that of a journal of a semi-humorous character, which holds out as a bait an immediate photograph of the adventurous person who will invest in a year's subscription, and a right to his heirs and executors, to have him or her photographed after death if he or she at the time of death has continued to be a subscriber. The first proposition might be an inducement to some people ; as for the second, we should fancy it would act as a deterrent.

The *Echo* asks, "When will some impecunious younger sons take up photography as their sisters do millinery?" The answer might well be, When their sisters take to making bonnets at home for their relations and friends without any charge. The impecunious younger son does practise photography, but only as an amateur ; and the odd thing is, that while no one thinks anything of this, the West End milliners would raise a terrible cry if aristocratic young ladies set up as amateur milliners.

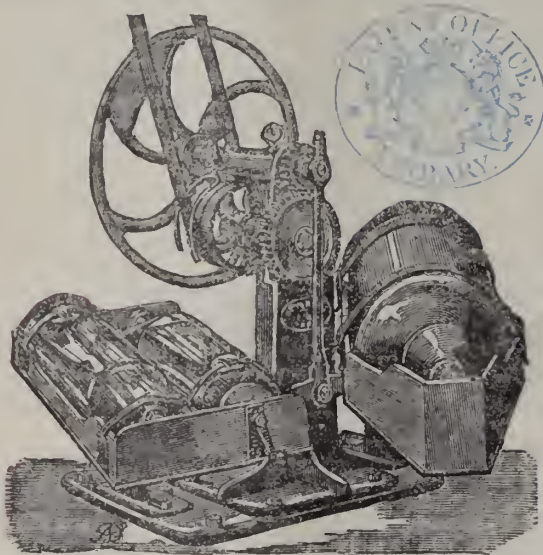
There is such a demand by artists for what may be termed "property" photographs, that we wonder some photographer does not go in seriously for extending the range of subjects. At present they are almost exclusively



confined to animals, but we fancy that instantaneous photographs of figures would be far more useful. It is said that an artist's model in New York is working out this idea very systematically. Armed with a detective camera, he goes about the city taking instantaneous pictures of ordinary street life. When he sees an unusual group, or particularly dilapidated tramp or bootblack of picturesque possibilities, he secures a negative, and artists gladly buy the results.

Steel dies for punching out photographic prints or for making masks are used occasionally by photographers, but the expense of the die is the usual obstacle. Hence many will be glad to hear of J. P. Beach's method of making dies by means of clock spring fastened round a wooden block. Details will be found on p. 339

The *American Druggist* gives the subjoined sketch of an agitating machine which is manufactured by Beyer Bros.,



of 16, Rue Lorraine, Paris. Possibly a machine of this kind may prove useful for agitating emulsions when being made.

We heard the other day of a curious instance as to how the "middleman" runs up the prices. "Here is a photograph case," said a manufacturer, "which I make and sell for 4s. The leather, the clasps, and the workmanship are of the best, and one dealer whom I supply will take all I can manufacture. I was at a shop the other day and I saw my own goods marked at 10s. 6d. Now I should like to know who gets the 6s. 6d. (more than a 100 per cent.) upon my charge for manufacture." The curious thing was, that he was quite contented with selling his goods at 4s., and stated that if any person other than a dealer came to him he would refuse to supply him. As for selling to the shop direct, it was not to be thought of. It would seem that the person in trade whose interests are most looked after is the much-abused "middleman."

Some itinerant photographers have very strict notions of propriety. An old gentleman who went to Swanage during the Whitsun holidays took a bath, and having on a very ornate swimming tunic, it occurred to him that it would be a good idea to be photographed in his costume, so he spoke to the proprietor of a photographic van on the beach. "Well, sir," said the photographer, "I should much like to do it, as I think it would make a good picture; but you see Swanage is so particular. I must defer to public sentiment, and if it were known I photographed you like that, it would be considered improper, and I should lose all my patronage."

The windows of stationers and photographic print dealers are just now flooded with what are called in the trade "opalines," art "opals," and "medallines." A fashion has set in for photographs on opal glass, the subjects of which are of the most various character, comprising (to quote a catalogue) "religious, secular, landscape, humorous, and many others." So far as we know, portrait photographers have not adequately taken advantage of the growing taste for photographs on opal glass, but it is difficult to move the public now-a-days to anything like enthusiasm concerning photographic portraiture; still a combined action might do much. But photographers never did combine in regard to any particular style, and we suppose never will. The average show-case is a melancholy example of individuality which forbids any hope of this kind. So far as the public are concerned, they merely regard photography as exemplified in the show-case as a most monotonous and stationary art.

A good many funny things have been written about the Queen and her photographs, but a statement in the *Citizen* of last week caps everything. Our contemporary gravely says: "It is no easy task to take a good photograph of the Sovereign, for her Majesty always insists that the Royal features shall be attached to a dummy body, considering that she has not herself been blessed by nature with a sufficiently Royal presence." One would like to have a few particulars as to how this extraordinary combination is produced. Has her Majesty a headless lay figure to do duty for her? It is well known, as we have before mentioned in these columns, that the Queen, when photographed in her state dress, stands upon a box, but this is a very different thing from having her face joined to a "dummy body." We are afraid somebody has been imposing on the *Citizen*.

Remembering the odium which of late has been cast upon the Metropolitan Board, it will scarcely seem an opportune moment for publishing the portraits of the members. The *Graphic*, however, thinks otherwise, and accordingly a fortnight or so ago the pictures of these gentlemen from photographs supplied, appeared. Two members, however, were absent, and a local paper, commenting on the fact, remarks: "There is a rumour that the two members in question are the only modest members now sitting on the Board, and that both positively refused to oblige with their photographs." The *Graphic*, if it wanted particularly to



have the portraits of these gentlemen, should have put in force what another illustrated paper which goes in extensively for portraiture finds a very effective method. "Very well, gentlemen," is the remark, when a photograph is refused; "since you won't oblige with a photograph, our artist must sketch you from life. He is sometimes very successful, but occasionally a taste for caricature is too strong for him to resist. We are bound to say that when he does caricature, the friends of the subject are always highly delighted." After this gentle hint, a photograph is generally forthcoming.

Here is a little story in two chapters. Chapter one. Some time ago a lady of fascinating manners, whose age was the right side of thirty, and who was dressed in widow's garb, called upon an old gentleman well known for his wealth, his liberality, and his susceptibility to flattery. The lady had a story to tell which touched his heart. Her husband had been dead six months, he had left her with three little children totally unprovided for, and she was struggling hard to maintain them. Unfortunately, she had got behind with the rent, and the landlord had threatened to distrain unless the paltry sum of eight pounds was at once paid. She was certain to succeed if she could only tide over this difficulty, and knowing Mr. —'s generosity, she had been emboldened to ask him for the loan of the amount, which she promised faithfully to return. All this was said to the accompaniment of glances from a pair of very bright eyes, and the climax was reached when the fair applicant pulled out a photograph of herself surrounded by her cherubs. The photograph was one of So-and-so's very best retouched, and the soft-hearted old gentleman admired the pretty picture exceedingly. His conquest was complete, and he at once wrote a cheque for the required sum. The lady thanked him with tears in her eyes, and departed.

Chapter two. The lady had not been gone five minutes before the old gentleman discovered she had left her photograph behind. But he was rather pleased than otherwise, because she would be certain to come back for it, and he would have the pleasure of a second interview, while in the meantime he could study her charming features at his leisure. He was still at this pleasing occupation when about half an hour afterwards a young man, pale and agitated, was ushered in. "I am from the bank, Mr. —," said the youth, "and I wish to know whether this cheque is right. It was presented to us about twenty minutes ago by a lady." "All right?" exclaimed Mr. —, testily, and scarcely glancing at the slip, "of course it is. What's the matter with it?" "Well, sir, some time after the lady was gone the head cashier was looking at the cheque, and it seemed to him that the letter *y* in the word eighty was different from the rest of the writing." "Eighty!" repeated the old gentleman, "there's no eighty; the cheque's for eight pounds." "There, we said so. The cashier was sure a *y* had been added." "You don't mean to say you paid the eighty pounds?" "Yes, sir, you see the figure eight is the one the swindlers always choose, and that's what excited our

cashier's suspicion. The worst of it is he was away at dinner at the time, and the man who cashed the cheque doesn't recollect the woman's features." "Not recollect 'em! I'll soon get over that difficulty," triumphantly exclaimed the old gentleman: "here's her photograph." And the picture was sufficient to lead to her detection. Ladies and gentlemen who live on their wits and other people's money, to be quite safe, should deny themselves the luxury of being photographed.

## Patent Intelligence.

### Applications for Letters Patent.

- 7,432. SAMUEL DUNSEITH McKELLEN, Spring Gardens, Manchester, for "Improvements in photographic cameras."—May 19th, 1888.  
 7,486. JAMES RODGETT McKIE, 135, County Road, Walton-on-the-Hill, Liverpool, for "Improved processes of obtaining more brilliant and permanent photographs than by the ordinary method, and the means to be employed in such processes."—May 22nd, 1888.  
 7,556. OTTO KREBS, 18, Buckingham Street, Strand, London, for "An improved process of transferring phototypes to lithographic stones."—[Complete Specification.]—May 22nd, 1888.  
 7,562. WILLIAM HENRY PRESTWICH, Warmington House, High Road, Tottenham, N., for "A revolving shutter for photographic lenses."—May 23rd, 1888.

### Specifications Published.

- 5,903. THOMAS RUDOLPH DALLMEYER, of 19, Bloomsbury Street, in the County of Middlesex, Optician, and FRANCIS BEAUCHAMP, of High Cross, Tottenham, in the County of Middlesex, Engineer, for "Improvements in what are known as instantaneous photographic shutters."—Dated 22nd April, 1887.

The shutter is formed of several segments of a sickle or chopper like form, which, when the shutter is closed, overlap each other, and when the shutter is open leave a roughly circular opening. These segments are pivotted to an annular plate, and they carry pins by which the necessary movements are communicated to them. These movements may be given by a second annular plate provided with cam grooves, cut in it, one for the pin on each segment. The cam grooves are of an angular form, so that the rotation of the plate in which they are formed at first opens the shutter to its full extent, and then (the plate continuing to rotate in the same direction) closes the shutter; or in place of having all the cam grooves in the annular plate, some or all of them may be formed in the segments, in which latter case the second annular plate is dispensed with, the tail of one of the segments being furnished with a lever, by which it, and with it the other segments, are actuated. In this case, in order to obtain the desired continuity of movement of the driving part, a crank or suitable cam groove must be provided to give the necessary to-and-fro movement to the lever.

The lens tube is made in one piece, a slot being made in it for each segment of the shutter—an arrangement which gives great strength, and insures the glasses of the lens remaining at their proper distances apart.

The power for opening and closing the shutter may be given by a spring retained by a trigger in any convenient or well-known way.

In order that my said invention may be most fully understood and carried into effect, I will proceed to describe the drawings hereunto annexed.

### Description of the Drawings.

Figure 1 is a front view of the apparatus with the shutter closed.

Figure 2 is a front view with the front plate and lever removed, the shutter being partly open.

Figure 3 is a front view with the front plate and lever and also the cam plate removed.

In these three figures the dotted circle shows the full opening of the shutter.

Figure 4 is a plan partly in section.

Figure 5 is a longitudinal section of the tube.



Figures 6 and 7 are an edge view and plan of one of the segments.

*a a* are the segments of the shutter, each being of a sickle or chopper-like form as shown in figure 7. They are pivoted at *b b* to an annular plate *c*, and they carry pins *d d*, which enter grooves in the cam plate *e*. The plate *e* carries a pin *f*, which passes through a slot in the cover-plate *g*. The pin *f* enters a slot in the lever *h*, so that by moving the lever *h*, the cam plate

*e* is turned, and the pins *d* are thereby forced first away from the centre, and then back again, by reason of the form of the slots in the cam plate *e*; the shutter is, therefore, first completely opened, and then, by the continuation of the same movement of the cam plate, is again closed.

Figures 8, 9, and 10 show a modification of this arrangement. In this case the cam plate is omitted, the pins on the segments

Fig. 1.

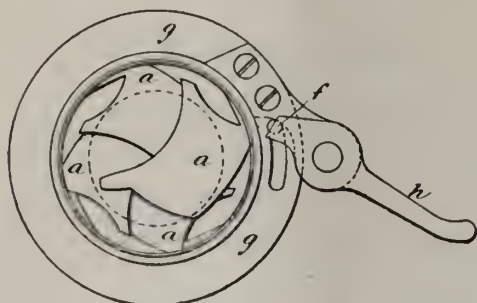


Fig. 2.

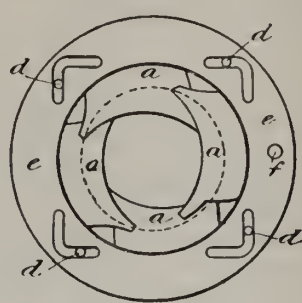


Fig. 3.

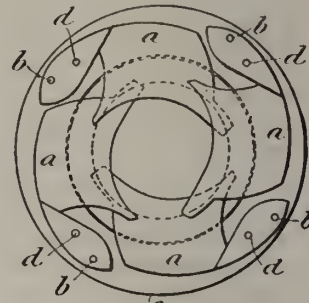


Fig. 4.

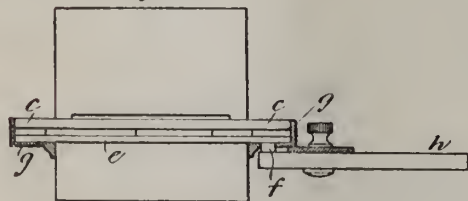


Fig. 5.

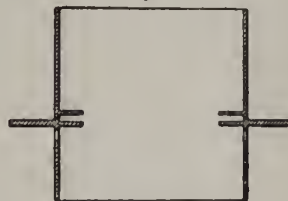


Fig. 6.

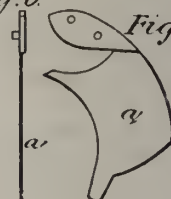


Fig. 7.

Fig. 8.

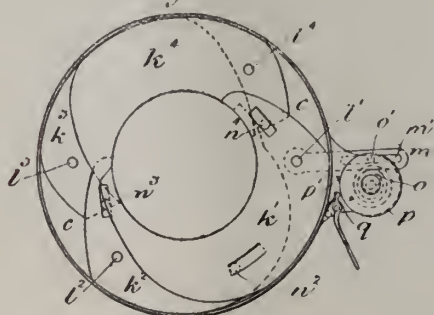


Fig. 9.

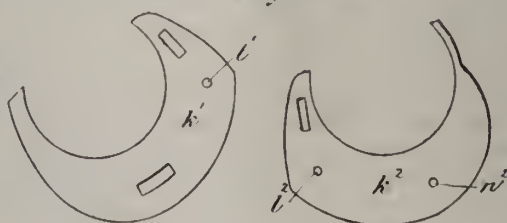


Fig. 10.

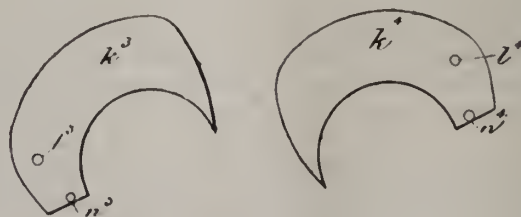
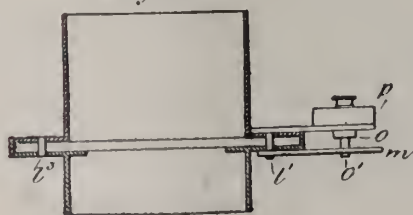


Figure 8 is a front view of the shutter when fully open, the front plate being removed.

Figure 9 is a transverse section of same, and

Figures 10 are plans of four shutters.

*k*<sup>1</sup>, *k*<sup>2</sup>, *k*<sup>3</sup>, *k*<sup>4</sup>, are four shutters, pivoted at *l*<sup>1</sup>, *l*<sup>2</sup>, *l*<sup>3</sup>, *l*<sup>4</sup>, to the annular plate *c*; they are actuated by a lever *m* fixed to the segment *k*<sup>1</sup>. The segment *k*<sup>2</sup> carries a pin *n*<sup>2</sup> which enters into a slot in the segment *k*<sup>1</sup>, and similarly the segments *k*<sup>3</sup> *k*<sup>4</sup> carry

pins *n*<sup>1</sup> *n*<sup>4</sup>, which enter into slots in the segments *k*<sup>1</sup> *k*<sup>2</sup>. The lever *m* is slotted at *m*<sup>1</sup>, and this slot receives the crank pin *o*<sup>1</sup> upon the crank *o*. As the crank turns the lever *m* has a to-and-fro motion given to it; as shown it is in its central position, the shutter being fully open. The crank *o* is actuated by a spiral spring in the barrel *p*, which carries a projection *p*<sup>1</sup>, which is retained by a catch *q*. When the catch *q* is freed the spring causes the crank *o* to revolve and thereby moves the lever *m* to



and fro, and so first opens the shutter and then closes it again.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

1. Photographic shutters which open from and close towards the centre, the opening being always of a roughly circular form, substantially as described.

2. Photographic shutters opening from and closing towards the centre, which are first opened and then closed by the continuous movement of the driving parts in one direction, substantially as described.

3. Photographic shutters consisting of three or more segments which, when the shutter is closed, overlap one another, and are of such a form that the central opening is always of a roughly circular form, substantially as described.

4. The lens tube made in one piece, with slots for the segments of the shutter, substantially as described.

5. Photographic shutters substantially as described and shown in figures 1 to 7.

6. Photographic shutters substantially as described and shown in figures 8 to 10.

7. Improvements in what are known as instantaneous photographic shutters, substantially as described.

9,159. JOHANN BARTOS of Wittingan, Bohemia, Austria, Photographer, and HERMANN KUHN of I Operngasse 4, Vienna, Austria, Merchant, for an "Improved process for producing grained relief and intaglio clichés from photographs."—Dated June 28th, 1887.

According to this invention, a polished metal plate is coated with a thin layer of a suitable varnish, such as shellac or asphaltum, and upon this layer of varnish a pigment photograph is applied. This pellicle, the thickness of which changes according to the depth of the half-tints of the image thereon, is afterwards treated in the usual manner with alum and glycerine in order to render it insoluble and to prevent it from becoming brittle; any surplus glycerine is then removed. Against the soft relief image thus prepared, sand is thrown by means of a sand thrower, the sand gradually destroying the pellicle, the thinnest portions first, and afterwards the thicker ones, affecting at the same time the underlying layer of varnish to a proportionate degree. When afterwards the remainder of the destroyed pellicle is removed from the varnished metal plate a grained picture will be shown, and by etching the plate with an acid, the picture may be engraved into the metal plate. When a positive photograph is applied to the metal plate, a relief cliché will be obtained, whilst negative photographs give intaglio clichés.

In carrying this invention into practice, thoroughly polished zinc or brass plates may be used with advantage, and a varnish consisting of a solution of 1 part by weight of gum-mastic, and 2 parts by weight of shellac in 100 parts by weight of alcohol, will be found to give good results. In order to render the varnish coating well visible, a small quantity of an aniline-dye is added to the aforesaid solution, which is applied by pouring it over the horizontal metal plate. A solution of 2 parts by weight of asphaltum in 10 parts by weight of chloroform, to which afterwards 30 parts by weight of benzine are added, will also do well.

As soon as the varnish upon the metal plate is dried, the photographic pigment picture, which is obtained in a well known way, may be transferred to the said plate, whereupon the portions of the picture which have not been acted upon by the light, and which in consequence have remained soluble, are washed out with warm water, in order to develop the picture. The next procedure consists in treating the dried pellicle with a solution of glycerine and alum, whereby the same is tanned—that is to say, the thin layer of glue is converted into a leather-like substance, and at the same time it is safeguarded against becoming dried and fissured. For this purpose there may be used to advantage a solution of 2 parts by weight of alum and 35 parts by weight of glycerine in 25 parts by weight of water. This liquid is poured upon the pigment picture, and afterwards this latter is dried with the aid of blotting-paper.

Thus prepared, the plate is subjected to the action of sand thrown against it, with the effect of gradually destroying, in the order of their increasing thicknesses, all portions of the picture except the thickest ones. As soon as any portion of the picture is destroyed, the varnish coating beneath the said portion is then attacked. The stream of sand may be projected by means of a revolving fan wheel, upon which sand is continually allowed to drop.

When the destruction of the pigment picture has been carried to a sufficient extent, the remainder of the said picture is washed, with the aid of water, from the varnish coating, on which, then, there appears a reproduction of the picture with all its details, formed by a great number of very small perforations of the layer of varnish.

Finally the plate is etched in the usual manner, and after the varnish coating has been removed by means of a suitable solvent, prints may be immediately taken from the plate.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, we declare that what we claim is—

1.—The method substantially as hereinabove described of producing grained relief and intaglio clichés from photographs this method consisting in applying a pigment photograph upon a smooth plate of suitable material, and afterwards gradually destroying the pellicle by means of sand thrown against it, which sand also affects the underlying plate.

2.—The method substantially as hereinabove described of producing grained relief and intaglio clichés from photographs, this method consisting in applying a pigment photograph upon a polished metal coated with a layer of varnish, afterwards gradually destroying the pellicle by means of sand thrown against it, the underlying layer of varnish being also perforated by the grains of sand, and finally etching the metal plate and removing the varnish.

10,844. JOHN KENNERELL, of Nos. 8 and 9, High Street, Wisbech Saint Peters in the Isle of Ely, in the County of Cambridge, Photographic Artist, for "Photographic camera clip."—Dated August 8th, 1887.

The full specification will appear next week.

13,332. JULES DECOUDUN, of 8, Rue Saint Quentin, Paris, France, Civil Engineer, for "An Improved photometer for measuring intensity of light in the photographic camera."—Dated the 1st of October, 1887.

Decoudun's photometer has been already described in the PHOTOGRAPHIC NEWS.

#### CITY AND GUILDS OF LONDON INSTITUTE FOR THE ADVANCEMENT OF TECHNICAL EDUCATION.

THE annual examination in photography held at Finsbury and South Kensington Colleges, and other educational centres connected therewith, took place Wednesday evening last, the 30th ultimo.

Considering that the Institute has for several years past defrayed the expenses incident to these public examinations, so that anyone may sit to work the question paper if his or her name be sent in a few weeks previously, it appears strange that the total number of candidates who have availed themselves of the privileges placed at their disposal should not in any previous year have exceeded a hundred and fifty, especially as there are so many learners of both sexes engaged in the study of photography.

The examination is of two grades—Ordinary and Honours—certificates (first and second class) being awarded in each grade.

*Prizes.*—Honours:—1st prize, £5 and a silver medal; 2nd prize, £2 and a bronze medal. Ordinary:—£3 and a silver medal; 2nd prize, £3 and a bronze medal; 3rd prize, £2 and a bronze medal; 4th prize, £1 and a bronze medal; 5th prize, bronze medal.

The following are the questions given by the examiner, Capt. Abney, R.E., F.R.S.

The results will be made known in August next.

#### INSTRUCTIONS.

The Candidate must confine himself to one grade only, the Ordinary or Honours, and must state at the top of his paper of answers which grade he has selected. He must not answer questions in more than one grade.

If he has already passed in this subject, in the first class of the Ordinary Grade, he must select his questions from those of the Honours Grade.

The number of the question must be placed before the answer in the worked paper.

Three hours allowed for this paper.

#### ORDINARY GRADE.

[Not more than eight questions to be answered.]

1. State what occurs when chloride of silver is placed in hyposulphite of soda. It is usually said that the chloride of silver dissolves; is this the case?

2. How is nitrate of silver formed from metallic silver? Give,



if you can, the chemical equation showing its formation. How much nitrate of silver should be formed from 270 grains of metallic silver ( $\text{Ag}=108, \text{N}=14, \text{O}=16$ ) ?

3. A gelatine negative is found to be too dense in parts; how should you reduce it ?

4. If the dark room window faces south, and you have to illuminate it by daylight, how should you proceed to render it safe for developing an ordinary gelatine plate when the sky is cloudy, and when the sun is shining on the window ?

5. The diameter of a stop in a single lens is measured and found to be 26 inches, and it is known that a plate requires fifteen seconds' exposure when using it; what would be the exposures required for a stop .21 inches and .39 inches diameter.

6. In an ordinary collodio-bromide emulsion plate it is necessary to add soluble bromide to the ferrous-oxalate solution during development, but with a gelatine bromide plate it is not; what is the reason of this difference in development ?

7. Describe the production of a platinum print, the prepared paper being supplied. Give the reasons of each operation.

8. Describe the intensification of a wet plate by means of cupric bromide and silver nitrate, or by mercuric chloride and ammonia. Give the chemical changes that take place in the silver image during the operations.

9. Describe a plan for producing blue prints on paper from a negative.

10. In many formulæ which come from the Continent weights are given in grammes, and volumes in cubic centimetres. A gramme is 15.43 grains, and 1,000 cubic centimetres (1 litre) is equivalent to 35.22 ounces; transfer the following formula into grammes and cubic centimetres :—

Pyrogallie acid	...	...	2 grains
Potassium bromide	...	...	3½ "
Sodium sulphite	...	...	10 "
Water	...	...	1 oz.

and this formula into grains and ounces :—

Ferrous sulphate	...	...	100 grammes
Glacial acetic acid	...	...	40 cubic centimetres
Water	...	...	750 "

11. Describe how you should make a gelatine chloride emulsion.

12. Describe the plan you would adopt to save the residues from spoilt gelatine plates and from albumenized paper.

#### HONOURS GRADE.

[Seven questions only to be answered.]

1. Describe some photo-mechanical process with which you are acquainted in detail, giving the reasons for each step, and when necessary, the chemical explanations of the same.

2. White light can be used under certain circumstances during the development of a negative. State the composition of the white light and the kind of plate that can be employed. Give fully the reasons for it.

3. When photographing a landscape in the evening it is found that a considerably greater exposure has to be given to a plate than in the morning. Explain the reason of this fully, and not merely in general terms. (It should be remembered that there may be sunshine in the evening.)

4. A silver salt is sensitive to a certain defined part of the spectrum. Suppose by some means all other rays of the spectrum are cut off from the white light, and that the rays to which the salt is sensitive are left of the same original intensity as they are in the white light. In such a case does it necessarily follow that the action of the white light and of the light thus selected would have the same quantitative action on the sensitive salt in same time ? Give the reasons for your answer.

5. Describe a single lens which will give straight lines in an architectural subject. On what principles is this lens constructed ?

6. Enter fully into the manufacture of an emulsion in gelatine for printing-out (not developed), and show why each addition is made. Describe how you should tone a print made with it.

7. Describe the production of a photo-gravure from a negative in half tone.

8. Discuss the relative advantages of an instantaneous shutter placed—1st, behind the lens; 2nd, in front of the lens; and 3rd, near the diaphragm in the case of a doublet lens.

9. Can you employ an ordinary double convex spectacle lens for landscape photography without sacrificing definition and flatness of field ? Give full reasons for your answer.

## Correspondence.

### THEORETICAL CONSIDERATIONS IN EXPOSURES.

SIR,—I would refrain from addressing you again, but Mr. Debenham's remarks might appear misleading, so I will explain myself in another way.

In the first place, the apparent size of an object is governed by the angle it subtends. Distant objects have to be moved to very considerable distances away from the observer in order to make much variation in the subtended angle. On the earth this is very limited, so that a distant object cannot be moved to a great distance beyond without being lost to sight, consequently distant objects subtend very nearly the same angle when moved away from the observer. The moon is, therefore, no comparison, for it might be moved away indefinitely, and still be in view, and it subtends a very considerable angle to start with, compared with the distance to which it might be moved.

In the next place, the size of the stop has a great bearing on the subject. Let me put it thus. Suppose a certain object in the view is out of focus to the extent of  $\frac{1}{30}$  of an inch circle of confusion, then the object is longer than it ought to be by  $\frac{1}{30}$  of an inch; not more, because with the exception of the semi-diameters of their circles at each end of the object, they overlap one another. By inserting smaller stops this undue elongation is reduced, whereas those objects more distant, being in focus, do not alter their size.

I am afraid, from the tone of Mr. Debenham's letter, he thinks that I am annoyed with the remarks he made, but such is by no means the case.—Yours faithfully,

DAVID SALOMONS.

Broomhill, Tunbridge Wells, May 28th, 1888.

SIR,—In your issue of the 18th May on the above subject, I wish to point out an error, doubtless an oversight or numerical error, that Sir David Salomons has made with regard to the formulæ for depth of focus.

If rays cross at all after refraction through the lens, or, in other words, an image be formed, granting the limit of permissible out-of-focus effect  $\frac{1}{100}$ th of an inch, there must be somewhere on either side of the crossing of the rays a circle of confusion of  $\frac{1}{100}$  inch.

Putting  $\Delta$  for the distance of object from lens, and  $f$  for the focal length, Sir David Salomons has taken  $\Delta = f$ , and so found the depth of focus is nothing. This is quite true; but when  $\Delta = f$  the object is placed at a distance equal to the focal length of the lens, and hence the rays do not converge after refraction at the lens, but emerge parallel.

For copying equal size  $\Delta = 2f$ , then necessarily there is depth of focus, and the formula holds good, as it should, throughout. Sir David Salomons' formula, obtained by subtracting the formula I gave in my paper on this subject, one from the other, is misleading, as I pointed out before, as the depth behind the point focussed for is always greater than the depth in front; from the single expression you naturally expect the mean on either side, and this is not exact.

If an approximation only is required, it is easier to work out the formula I gave, for depth in front, and it is then known that the depth behind will be somewhat greater. To repeat :—

$$\text{Depth in front} = \text{difference between } \Delta \text{ and } f + \frac{f^2 R (\Delta - f)}{f^2 R + \frac{1}{100} \Delta}$$

$$\text{Depth behind} = \text{difference between } \Delta \text{ and } f + \frac{f^2 R (\Delta - f)}{f^2 R - \frac{1}{100} \Delta}$$

When copying equal size, it is quite contrary to optical



principles to suppose that "depth of focus would not depend upon stopping down." To point out this fallacy, evidently resulting from a slip in calculation, is my excuse for further correspondence on the above subject. A temporary absence from town prevented me from seeing the paper before.—Yours faithfully,

THOS. R. DALLMEYER.

25, Newman Street, W., May 29th, 1888.

#### DALLMEYER'S RECTILINEAR LANDSCAPE LENS.

SIR,—Your issue of March 9th, with a drawing and description of Dallmeyer's very ingenious "Rectilinear Landscape Lens," is just to hand. I quote the following from your remarks.

"It effects a combination long desired by the outdoor worker:—the brilliancy of the old fashioned single lens with the straight lines, and the portability of the rectilinear doublets," "can advantageously replace the rectilinear doublets, especially where extreme purity of image is an essential."

I have always understood that the undoubtedly superior brilliancy or purity of the image given by the single landscape lens of the old form, as compared with that given by any other form of lens, is entirely due to the fact that such a single lens has but two reflecting surfaces in place of a minimum of four in any other lens. Now in the new "rectilinear landscape lens," we have four reflecting surfaces just as to the various forms of doublet. It is true that the total thickness of glass is, perhaps, a little less in the new form of lens than in the ordinary doublet, but the amount of actual opacity in optical glass is so small that it does not need to be taken into consideration at all in connection with photographic lenses.

Finally, you say of the three drawings that are given of various of Dallmeyer's lenses, that they are all "to scale." I presume that by this is meant all to the same scale. If this is the case, the new lens does not combine the "portability of the rectilinear lens" with any qualities, real or imaginary, of the single lens.

Perhaps, Sir, Mr. Dallmeyer himself will elucidate the points indicated above, unless, indeed, the matter has been thoroughly ventilated long before this reaches you. I hope that he and you will both believe that I write, not with the intent to criticise carpingly, but to get actual information on a point that is of importance to all photographers, but that is of more than ordinary importance to those living at a great distance from all photographic headquarters, who have, except at a ruinous expense, to take things at second-hand, because they have not the opportunity of trying for themselves.—I am, Sir, yours, &c.,

W. K. BURTON.

[Our correspondent's letter bears neither date of place nor date of time; but, as partially explaining the above communication, we may mention that he is now resident in Tokio, Japan.]

#### DETECTIVE CAMERAS.

SIR,—In the report of the meeting of the N. L. P. S. in your last issue, it is stated that we claimed to have made improvements on the Samuels' detective camera. This statement on the part of your reporter is distinctly misleading, as neither do we claim to have "improved" Mr. Samuels' instrument, nor would he, we imagine, be satisfied to recognise in ours an improvement on his own, when, as a matter of fact, the two are perfectly distinct in their principal details.

The Chairman was good enough to speak of our substitution of Suede leather for india-rubber cloth as an improvement, but beyond that, except that in both instruments the plates are held in metal carriers—a convenient form of which is Mr. Samuels' patented "Sheath," for the use of which we pay a royalty—there is no further resemblance. The form of "lifter" and method of changing are different, as are also the means of exposure and the

style of shutter. In fact, after the one common feature of "sheaths," the similarity entirely ceases.

The points we claim for our camera are the self-contained character of its arrangements and working parts, and the entire absence—with the exception of a key—of all detached portions; the capability of working the shutter immediately before or behind the lens, or, if preferred, immediately in front of the plate; and finally, in addition to the relay of a dozen plates contained in the instrument itself, we provide extra detachable plate holders, fitted with the necessary changing arrangement by means of which an unlimited number of plates can be carried when away from home, all of which are available for exposure without any necessity for a dark room.

Trusting you will do us the justice of allowing us to make this explanation,—We are, yours, &c.,

W. W. ROUGH & Co.

180, Strand, London, May 28th, 1888.

#### WIDE CLAIMS.

SIR,—In the current issue of the NEWS (page 328), a notice is given of a magnesium flash light referred to in "Der Amateur Photograph," as having been constructed by L. Schultness, of Zurich. Will you kindly give me space to point out that in every essential particular the said lamp is copied from one for which provisional protection was granted to Mr. J. W. Hart and myself in January last, and which, having been repeatedly described, has for some months been on the market as the "Hart and Bishop Flash Lamp."

It is desirable to notice that the special features of our specification are the combination of a lamp with a containing vessel so constructed as to allow of the discharge of a definite quantity of any combustible powder by a blast of either air or oxygen gas, such blast being produced by the compression of an india-rubber ball or otherwise; and that consequently all lamps constructed on this principle are (in England, at least) infringements of our rights in the matter, a fact to which we think it well to call the attention of your numerous readers.

It will be further seen, therefore, that the lamp referred to on the same page of the NEWS as Professor Cohn's apparatus would, if constructed in England, come under the same category. Thanking you in anticipation,—I am, Sir, your obedient servant,

WM. BISHOP.

52, Lady Margaret Road, N.W., May 26th, 1888.

#### FEMALE EMPLOYMENT IN PHOTOGRAPHY.

##### COLOURED PHOTOGRAPHS IN CANADA.

SIR,—Your issue of the 4th inst. is to hand this day, and we at once write to confirm what Mr. Alfred H. Bool says therein as to the great opening photography offers to ladies with any artistic taste at all.

We are continually sending hundreds of our photographs to England to be coloured, and though the price we pay for cabinet sizes is very low, 3d. each, yet we remit with the order, and give hundreds and thousands out to be done. We make 6,000 photographic works of art a day, and are now building so as to print 12,000 a day, and are willing to give colouring work all over the world at a price consistent with merit.

So far, we find London our best and cheapest field, America and Canada being averse to or incompetent for the work. Ladies' acknowledged taste for colours makes their handiwork preferential.

SOULE FINE PHOTOGRAPH COMPANY.

ALEX. S. MACRAE, 127, Wellington Street, Toronto.  
15th May, 1888. Director for Canada.

#### Proceedings of Societies.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.  
The usual weekly meeting was held on the 24th inst. W. E. DEBENHAM occupied the chair.



J. J. BRIGINSHAW passed round a negative having some peculiar markings upon it which appeared during development.

J. B. B. WELLINGTON thought a crystal must have by accident fallen into the developing dish, the rocking of the dish causing the crystal to roll over the plate.

The CHAIRMAN was of opinion that it was a pinhole photograph. Some markings of a similar character that appeared on some of his negatives he traced to a tack hole in the front of his camera.

The CHAIRMAN said pinhole photography had lately been the subject of special interest in France. In a communication to the French Photographic Society recently presented by Capt. Colson, the results of his experiments in this direction were given, by which it appeared that a sharper picture was not obtained by simply reducing the aperture, but a geometrical proportion existed that had a definite relation to the focal length of the camera, or the distance between the opening and the sensitive plate.

A. COWAN remarked that Lord Rayleigh had, in a paper read before the Royal Society, given the diameter of the aperture that gave the best image at stated distances.

The development of chloride plates with pyro and ammonia being referred to, the CHAIRMAN said a general idea prevailed that chloride plates could not be developed with this developer. It would be interesting to have any experience of the members present on this subject.

W. H. HARRISON believed Dr. Eder had published a statement to the effect that chloride plates were more amenable to development with pyro and ammonia.

A. COWAN said an objection had been made to the use of Decouden's photometer, from the difficulty experienced in manipulating it in the field, it being impossible to see the image through the darkened discs, except at a distance of from ten to eighteen inches from the photometer. He suggested that an eyepiece should be adapted to it. This would render it a much more convenient piece of apparatus than as at present.

W. T. WILKINSON exhibited a sheet of transfer paper prepared for photo transfer work. It only required sensitising with bichromate of potash and alcohol to prepare it for use. He announced his intention of giving a demonstration of this branch of photo-lithography at the next meeting.

J. B. B. WELLINGTON showed some platinum prints by the Pizzighelli printing-out process. He had found it very easy to work; the formula looked complicated, but was quite simple. The sensitising materials were applied to the paper with a brush. Sepia tones were produced by the application of bichloride of mercury. He considered the results superior by this process to those obtained with ordinary platinotype.

The CHAIRMAN considered the process a decided advance.

W. H. HARRISON thought the slowness of printing would be a drawback.

J. B. B. WELLINGTON had not found it particularly slow. The prints shown were printed in about an hour one morning.

The subject of development with hydrokinone was then referred to, several members remarking upon the different results from different samples of hydrokinone they used.

J. B. B. WELLINGTON showed negatives developed with the following formula:—

1.—Hydrokinone	...	...	...	120 grains
Sulphite soda	...	...	...	1 ounce
Bromide potassium	...	...	...	25 grains
Water	...	...	...	15 ounces
2.—Carb. pot.	...	...	...	2 ounces
Carb. soda	...	...	...	2 "
Water to make	...	...	...	20 "

Equal parts. If found too energetic, it might be diluted with water. About a minute elapsed after the developer was poured over the plates before the image began to appear; development was then very rapid indeed.

F. P. CEMBRANO exhibited the Manx camera-stand that he had referred to in a discussion on the subject at a previous meeting.

P. EVERETT inquired whether any advantage would be gained by bringing the two combinations of a symmetrical lens closer together.

The CHAIRMAN said it might be done with advantage with some lenses; the angle would in consequence be increased.

#### BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE usual meeting of the above Society was held at the Technical Schools, Bridge Street, on May 24th, W. J. HARRISON, F.G.S., in the chair.

George Hill, Andrew Hardwick, F. W. Keeley, J. T. Mousley, and Whitworth Wallis were elected members of the Society.

CHARLES PUMPHREY then read his paper on "Stereoscopic Pictures from Film Negatives," and exhibited a number of the same in the stereoscope taken by him on films in Switzerland. His explanation and description of the process proved of great interest to the members present. In the discussion which followed, C. Pumphrey said the great bar to taking stereoscopic pictures with amateurs was the extreme care and exact manipulation required.

B. KARLESE suggested that an inducement be given by the council for stereoscopic work at the next competition or annual exhibition.

In answer to a question, J. PLACE said stereoscopic lenses vary from  $4\frac{1}{2}$  to 6 inches focus.

#### PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting of the Society was held on Wednesday evening, May 2nd, 1888, with the President, FREDERIC GRAFF, in the chair.

Attention was called by the President to an exhibition of the work of members which it was proposed to hold from May 23rd to June 2nd, inclusive. From the pictures exhibited, and entered for such competition, the presentation pictures for 1888 would be selected.

FREDERICK E. IVES made the following communication:—"At a recent meeting of the Franklin Institute, I announced the successful application of chlorophyll to gelatine bromide plates, in the following manner. Rapid commercial plates were flowed with suitable alcoholic solution of chlorophyll, then dried, then soaked in water. The plates prepared in this manner, and then dried, are more colour-sensitive than commercial orthochromatic plates, besides having relatively sufficient red sensitiveness; but owing to excessive blue sensitiveness, should be used with a deep orange colour screen. The successful application of chlorophyll in this manner suggested a trial of other colour-sensitizers in the same way. The result was a great surprise. Rapid commercial gelatine bromide plates flowed with alcoholic solution of erythrosine, then dried, then washed or soaked in water, proved to be ten or fifteen times more colour-sensitive than commercial orthochromatic plates. They work clear and bright, and quick enough for portrait work with the yellow screen."

Mr. ROSENGARTEN showed some examples of chemicals which had recently come into notice for photographic purposes. They consisted of meta-sulphite of potash, bi-sulphite of potash, hydroquinone, and muriate of hydroxylamine.

Dr. MITCHELL stated that he had obtained excellent results with hydroxylamine in combination with pyrogallie acid, as a developer for lantern slides. The developer kept perfectly clear during development of twelve slides, and then was but slightly tinged with yellow. The colour of slides was a rich purplish black with clear shadows. The formula was one recommended recently by Mr. Cassebaum.

Mr. BARTLETT had also employed with the best results the formula of Mr. Cassebaum, in using hydroxylamine and pyro for window transparencies, and could recommend it for giving fine tones and good printing qualities to negatives. He had used the same solution upon a number of plates without observing any muddiness. He had hoped it would be advantageous in developing bromide prints, but was not fortunate in his results, the paper becoming stained and clouded in the whites. He deprecated the use of hydroxylamine alone in connection with alkalies as a developer, and spoke of the injury it caused by reticulating the film.

Mr. ROSENGARTEN moved that a committee be appointed to experiment with the new developers coming into notice, and to give a demonstration before the Society, at such time as may be convenient. Dr. Mitchell and Mr. Bartlett, with Mr. Cassebaum, by invitation, were appointed a committee for this purpose.

GEORGE VAUX asked if the salts of quinine had ever been successfully used in development.

Mr. TATHAM stated that a large proportion of acid was necessary to dissolve the quinine, and the addition of the alkali made the mixture turbid.

Mr. BARTLETT called attention to his experience in intensifying



gelatine plates with bichloride of mercury, followed by ammonia, which he thought would be of practical value, on account of the capability it afforded of controlling the degree of strength. He said that with the method usually pursued, one was obliged to take whatever degree of intensity the mercury would give, and that frequently the negative was made entirely too dense for printing purposes, and gave harsh results with chalky high lights. The method he follows is to first immerse the flat overtimed negative in a bath composed of,

Perchloride of iron (cryst.)	...	...	120 grains
Citric acid	...	...	240 "
Water	...	...	32 ounces

The object of which is to thoroughly clear up the shadows, and to remove any slight trace of fog, which, if allowed to remain, would increase only with the intensification, and injure the brilliancy of its result. The negative is allowed to remain only a few minutes in this bath, which is, in reality, a powerful reducer, and would, if the action upon the plate were long continued, obliterate the image. On removal, the negative is washed under a tap, then transferred to the bichloride of mercury solution, which may be of any strength from 10 per cent. up to saturation, a little chloride of ammonium being added if necessary to facilitate solution. After the film is well bleached, it is again washed, and placed in ammonia and water (1 drachm to 2 or 3 ounces). The negative should be allowed to gain all the strength possible, no matter how dense, even to the appearance of cast iron, inasmuch as the means of reduction to any desired degree of strength are completely under control. All that is necessary is to re-immers the negative in the solution of perchloride of iron and citric acid, as given above, and to watch until the gradations of light and shade are properly represented upon the plate. The resultant negative is harmonious in tone and of excellent printing qualities, and also keeps well. Mr. Bartlett thought that the preliminary bath of iron tends to destroy the last traces of hypo in the film, and thus prevents staining when the mercury is applied. He believed that the philosophy of intensification consists in first clearing up the film before application of the strengthener, and that whatever method of intensification is employed, the perchloride of iron solution will be found a most excellent clearer, he having first recommended it more than a year ago in connection with Mr. Cassebaum's gallic acid and silver intensifier. In regard to permanence of intensified plates, Mr. Bell claimed that mercury followed with ammonia, mercury followed with cyanide of silver, mercury followed with bromide of potassium or sulphite of sodium, are permanent; but plates strengthened with iodide of mercury in any form are fugitive, and it should be used only when the negative is not to be preserved, and great contrast is required.

Mr. TRUSCOTT (a visitor) said his experience was opposed to this, as he had no trouble with iodide of mercury on that score; and, although the image so intensified was liable to turn yellow (especially if the action of the mercury was very complete), even during washing, it was quickly restored and rendered permanent by a momentary dip in the fixing bath, or a more prolonged immersion in a very dilute solution of hypo. He stated that his experience with mercury and ammonia was more especially in connection with the toning of collodion transfers and opals, in which case, although it gave very fine brilliant tones, all the beauty faded out during drying, especially if hastened by heat. One advantage of iodide of mercury was its being a one-solution method, allowing every facility for watching the progress of the process. He thought that more permanency was to be expected by whitening the image with mercury chloride, and, after washing, blackening with dilute hypo or sulphite of soda, than from any other form of mercurial intensification.

Mr. Bartlett substantiated Mr. Bell's remarks that the method advocated by Mr. Truscott would cause the entire destruction of the plate. He had some time ago made experiments with a view of obtaining a warm brown tone upon gelatine lantern slides, and had employed for the purpose mercury as a toner before fixing, followed by a dip in the hypo solution. The image bleached out by the mercury was reproduced by the mercury in a beautiful brown tone, quite to his taste; but, unfortunately, it was very fugitive, the whole slide fading out in a day or two when exposed to the diffused daylight.

Mr. BROWNE stated that he had doubts as to the permanency of gelatine plates after being strengthened with mercury bichloride, mentioning many cases where positives and negatives had been seriously injured or destroyed by using this chemical

with after-application of ammonia. Even a final treatment with hypo had not, in his hands, been satisfactory. The results of intensifying with mercury, and after-treatment with silver cyanide, yielded some lasting negatives, but the action of these chemicals was so vigorous that the high-lights were inclined to be too strong. He mentioned that in looking over a number of gelatine positives made several years ago (all of them having been treated with mercury and ammonia), the pictures had almost faded from view. Thinking that possibly a second application of the same chemical might repair the damage, the process was repeated and proved successful; showing that positives or negatives which appear to be utterly worthless can be rescued, at least for the purpose of reproduction. Of course every photographer of experience is aware that it is useless to apply mercury bi-chloride to a gelatine plate unless it has been thoroughly washed to remove the hyposulphite of soda. In the case of the fading gelatine positives mentioned, the speaker was not prepared to say that all the hypo had been removed; but in other experiments, especial care had been taken to remove that objectionable chemical. A few trials seemed to point to platinum bichloride as an intensifying agent for gelatine plates.

The discussion turning to the subject of quick *v.* slow plates, Dr. MITCHELL favoured the former for landscape work, particularly for foliage in shaded places, where long exposure would be necessary with slow plates.

Mr. BARTLETT thought that the objection of Dr. Mitchell to the use of slow plates for landscape work, because of the motion of the foliage, was rather more applicable to very rapid plates. He thought that the slow plate, by reason of its diminished sensitiveness, was less liable to translate upon the film any slight motion of the foliage, than a rapid one; that a very rapid plate would register impression which would not be perceptible upon a slow plate.

In this connection Mr. BELL remarked that Dr. Mitchell's objection would hold good only when a shutter was used; if it were time-exposure the movement would be registered upon the plate more than if a slow plate was used, as then the foliage could be watched, and the lens covered with a cap, and exposure begun again when the foliage becomes quiet. "There is not in the market a slow enough plate for this mode of working on a windy day. A plate requiring thirty seconds to one minute exposure would be what I recommend, collodio bromide."

Dr. C. L. MITCHELL remarked that in comparing the merits of slow and rapid plates he was inclined to give preference to a quick plate, particularly in photographing woodland scenery. On the latter a long exposure was nearly always required; in fact, a plate could hardly be over-exposed, and if a slow plate was used it was difficult to avoid the movement of the foliage, without repeatedly capping and uncapping the lens, and thus running more or less risk of blurring the outlines of the picture. With a rapid plate, on the other hand, a much shorter exposure was required, and the occasional interval of quiet during a light summer breeze generally afforded sufficient time to obtain an excellent negative.

Dr. MITCHELL remarked that much of the adverse criticism which rapid plates received was due to a lack of proper handling of the plate during the process of development. The fault was not so much in exposure, for it was perfectly possible to take a plate which had been very much over-exposed, and yet obtain a good negative from it. The amateur in development was generally guided too much by the printed sheet of instructions accompanying each box of plates—take so much No. 1 and so much No. 2, mix them and flow over the plate—and proceeded to develop all his exposures according to this iron-clad formula. The result was that many of his exposures were ruined, whereas if the development had been carefully studied, a much smaller number of failures would have resulted. In development it was well to bear in mind the cardinal principles that pyro gave density; the alkali was the accelerator, and hastened action and also brought out detail; and bromide retarded action and kept the shadows clear. Then each plate should be made a separate study of, and its development conducted according to these rules. If over-exposed, the usual quantity of pyro should be used, but very little alkali to commence with, and if the action did not proceed at once, then adding cautiously more alkali, a few drops at a time, until the image began to show itself. In commencing development with a new developer, unless the plate was known to be under-exposed, it was well to add a few drops of bromide. For subsequent plates this was not necessary, as the chemical action of the developing liquid on the plate resulted in the absorption of a certain amount of bromide in the developer



from the plate. For this reason, with each subsequent plate the action of the developer became less rapid. Dr. M. was in the habit of saving the developer after use, and keeping it in an amber glass bottle with a rubber stopper. In commencing development with a fresh developer, it was his usual custom to add to this about one-third of its bulk of the old reserved developer—the result being a slowing of the development—and a much more soft and even action of the liquid upon the plate.

Mr. BARTLETT thought that development was a fine art, requiring constant practice, like music, to keep one's self in working order. He believed it required an exercise of judgment, and that the mode and development should be in accordance with the character of the subject. In his pictures of still life, where he desired harmony in preference to brilliancy and great contrast, he slightly overtimed his subject to ensure softness; then in the development, in spite of the fact of the plate being overtimed, employed an excess of alkali over the pyro, with a large proportion of water; for instance,

Stock solution of pyro...	...	1 drachm
Stock solution of alkali	...	1½ to 2 drachms
Water	...	8 or 10 ounces

The plate he allowed to come up slowly until the detail finally appeared, and to then remain a reasonable time in the developer if he found it gradually acquiring strength, but if it showed tardiness he added pyro to strengthen. He employed the same method with success in developing magnesium flash light pictures, in which it is necessary to keep down contrasts.

Mr. CARBUTT volunteered a few remarks on developing instantaneous exposures. He said during the past week he had been trying three modes of developing instantaneous exposures, using the same alkaline solution, but in varying degrees of strength:—First, by using it the full strength as given in formula accompanying the Eclipse plates, and published in the *Photographic Times* of March 30th; second, by following directions given in that formula for instantaneous exposures, and when detail was fully out, but yet lacking density, rinsing off, and placing in the hydroquinone developer published for use in making transparencies, leaving it in this until full density was obtained; third, by taking 2 ozs. of the dilute soda solution, 2 drachms of No. 1, 6 drops of the bromide solution, and 8 ozs. of water; the exposed plate immersed in it, covered only, and occasionally agitated. It took one hour to fully develop the image, and the result was very satisfactory, the gradations being very finely rendered. The first method, using the concentrated soda solution on the plate, and afterwards adding to each ounce one drachm of No. 1, brings out the image in about the same time as a fully-exposed plate, but the deposit is very coarse, and lacks the delicacy of the slower method. For instantaneous exposures at the seashore, Mr. Carbutt believed most photographers used too rapid a plate, and he further remarked that orthochromatic plates would give better results for such work than plain bromide plates; also in developing time exposures, better results will be secured when using a fairly rapid plate, by diluting the alkali solution, and using bromide in the developer, bringing out the image slowly.

Mr. CLEMONS (visitor) showed a number of fine silver prints on plain paper, prepared by a new process. Both wet and dry plates were used in making the prints (portraits), Mr. Clemons preferring the results from wet plates, as having less tendency to flatness. The details in both high lights and shadows, together with the intermediate gradations, were beautifully rendered.

The SECRETARY showed a convenient device for use in the dark room in cutting plates in half. It consisted of a thin board about 7 by 8 inches, on one side of which a strip of wood was attached 4½ inches from one edge. To cut a 4 by 4 plate in half, it is laid with one end close to the edge of a table or other suitable support. The cutting board is laid on top with the strip pressing closely against edges of both plate and table. This will bring the edge of the board in proper position for use as a ruler to guide the diamond or glass cutter, so as to cut the plate exactly in half without necessity of measuring. Plates can be cut with utmost convenience and accuracy in absolute darkness. Other strips can be added, or the position of strips made adjustable for cutting plates of any required size.

## Talk in the Studio.

HISTORICAL PHOTOGRAPHIC CURIOSITIES AT THE PARIS EXHIBITION.—With reference to this, W. H. Harrison writes:—

"An essential addition to a remark of mine made at the last meeting of the Photographic Society has been omitted from your report, and I am obliged to ask you to print it, because otherwise photographers might possibly send some curiosities to the Paris Exhibition under a mistake. I said that I *thought* that I had read in a French photographic journal that no charge for space would be made for historical photographic curiosities sent to the Paris Exhibition, but was not quite sure that my memory could be trusted in the matter."

DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.—The first excursion of this Association for the season took place on Wednesday, the 23rd inst., when a party, numbering thirty, left Dundee, Taybridge Station, at 7.45 a.m., taking the East Fife circular tour to visit a few of the picturesque fishing villages on the East coast. The first stop was made at Anstruther—generally shortened by the residents to Anster—where, on leaving the train, brakes were found waiting to drive the party to St. Monans, calling first at Cellardyke, where cameras were unlimbered, and a busy hour spent at the harbour and the village. Unfortunately too little time was given to do anything like justice to St. Monans, the destination of the day's drive, where any amount of picturesque bits were to be had. One of the best of the day was the ruined Castle of Newark, being only got by two of the party. Here the train was joined for Largo, the birth-place of "Robinson Crusoe," where, at the Crusoe Hotel, the excellent lunch was thoroughly appreciated after the bracing drive along the coast. Two hours were spent here before leaving for Dundee, which was reached about 6.30. The eighteen cameras of the party were the means of exposing 145 plates, and as the weather was all that could be desired, the result will, no doubt, be a number of very successful pictures.

PHOTOGRAPHIC CLUB.—The subject for discussion on June 6th will be "Carbon Printing, with Demonstration." Saturday outing at Totteridge to Mill Hill.

## To Correspondents.

R. WATERER.—If obtainable anywhere, you will get it from Harold Senior, of 88, Norwood Road, Herne Hill, S.E.; or the Platinotype Company, of 29, Southampton Row, W.C.

PLATINOTYPE.—See answer to R. Waterer.

COLONEL.—1. If anywhere obtainable, you will get it from one of the firms mentioned in answer to R. Waterer. 2. The exact quantity is not very material, but one-fourth the weight of the pyrogallol answers very well, and does not occasion the same inconvenience as arises from a large excess of citric acid.

GREEN FOG.—You evidently use too much bichromate. Try half the quantity, and add a drachm of ammonia to each four ounces of solution.

J. THOMPSON.—If your photograph was properly registered before a copy was sold, and if you can satisfy the magistrate that the painting is a copy of your photograph, you will probably obtain judgment. Considering the view is one so much photographed and painted, it may be rather difficult to establish the latter point.

S. R. M.—You had better not wet the prints or treat them with chemicals in any way, as in the case of an old print, mere moistening will often cause decomposition to set in. Your best way will be to compress as tightly as possible in a printing frame, and photograph them with the camera, doing on the negatives or the reproduced prints such retouching as may be considered desirable.

W. B. BAKER.—Any communication intended for our department should be addressed to the Editor. We cannot, however, say anything about the contrivance without seeing it, or knowing more. Why not arrange with some dealer in London to have one on view? And it may be worth your while to send one to the photographic department of the Paris Exhibition of next year. In this case you should communicate with H. T. Wood, Society of Arts, John Street, Adelphi.

## The Photographic News.

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# THE PHOTOGRAPHIC NEWS.

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## PHOTOGRAPHERS' GRIEVANCES IN CANADA.

THE *Toronto Mail* complains of something which seems to very nearly approach the jobbery of the Metropolitan Board of Works type, in the Fiscal department of the Dominion; the manufacturers of dry plates in Canada having induced the authorities to put a special impost on dry plates, apparently to the detriment of all concerned, excepting the owners of the few dry plate factories in the Dominion. The *Mail* says:—

The end of the present session of Parliament is near at hand, but so far there has not been the slightest intimation on the part of the Dominion Government of an intention to relieve the photographers from the heavy burden which is laid upon them by the tariff. As we have on a former occasion pointed out, most of the important articles used in the practice of photography are not made in Canada, but are nevertheless taxed to the extent of from 25 to 30 per cent. The photographers do not so much complain of the duties on these articles, as they do not expect that they should be specially exempted from the operation of the general fiscal policy of the Government. There is, however, one line of goods, that of gelatine dry plates, which has been most exceptionally singled out to bear a duty varying from 60 to 100 per cent., according to the value of the plates in the export invoice. It is safe to say that the tariff contains no other instance of so unjust a discrimination against a particular class of the community. It may be as well to explain that a dry plate is simply a plate of glass coated with a highly sensitive gelatine—bromide of silver emulsion—and that upon the quality and uniformity of these plates depends the possibility of turning out good photographic work. There are three manufacturing of dry plates in Canada, and the Minister of Customs was induced by the representatives of the firms interested in these concerns to change the duty from 25 per cent. *ad valorem* to a uniform tax of 15 cents. per square foot. It will be readily seen that this tax presses most heavily on the cheapest plates which are made in England, and it has practically shut them out from this market. The best and highest priced plates used in Canada are made in the United States, but even upon these the duty amounts to 80 per cent. The photographers complain very bitterly that, as it is necessary in these days of critical patrons to use the imported goods, they have to pay this heavy duty in every case where good work is called for. They state, moreover, through their organisation—the Photographers' Association of Canada—that the hands employed in the Canadian manufactories of dry plates number about fifteen, while the number of those deriving a livelihood from the practice of photography in its various branches is nearly *three thousand*. It is unnecessary to point out that the photographers are

suffering a very grave injustice in this matter, more especially as it unfortunately happens that with the exception of cameras, stands, and backgrounds, every other article they require has to be imported, and is taxed the average tariff rate.

## ALLEGED DELETERIOUS MOUNTS.

ROBINSON v. DAVIES AND Co.

THE action Robinson v. Davies and Co. was tried at Clerkenwell County Court, on Thursday, 31st May, by the judge of that Court, His Honour Judge Eddis. Mr. Wills, instructed by Mr. Harrison, 50, Chancery Lane, was counsel for the plaintiff, and another learned gentleman for the defendant.

The action was brought by the plaintiff, a photographer at Holloway, to recover damages for the alleged defective quality of, and deleterious ingredients used in, the manufacture of cards for mounts supplied by the defendants, who are wholesale stationers and card makers in Bevis Works, City. The plaintiff claimed £50 damages.

The defendant disputed the claim on the grounds appearing in the evidence, and filed a counter-claim against the plaintiff for £3, the price of the cards supplied.

The plaintiff's counsel, in opening his case, stated that the plaintiff had noticed, in using the cards, that his prints were damaged in colour. Thinking the fault might be in the paper he used for printing, the plaintiff changed his paper, but the stains and spots continued to appear, and, on analysing the mounts, they were found to contain five per cent. of oxide of iron.

The plaintiff was called, and deposed that in November, 1887, defendant's traveller called, and showed samples of cards of which plaintiff ordered 5,000; these were delivered in a month, and he began using them. Noticing the prints were stained, and thinking his paper might be in fault, he tried other sorts, but the faults were still apparent. On complaining to the traveller, and showing him a spoiled print, he said there was no fault in the cards. The plaintiff had the mounts analysed, and found that they contained five per cent. oxide of iron. The plaintiff tore some prints in half, and mounted one-half on defendant's cards, and the other on other mounts (produced).

The plaintiff, on cross-examination, denied that there was any considerable per-centage of failures in prints as a rule, but admitted that prints might fade if insufficiently washed, owing to hyposulphite of soda remaining in the paper. He added that the discolouration was not due to any dirty manipulation.

Witnesses were called in support of plaintiff's case, one of whom stated that he had tested one of the cards, and found 5 per cent. of oxide of iron. Being a chemist, he said from his own knowledge that the iron in the mount would affect the silver in the print, but could not say the damage might not have occurred in any other way.

A sitter was also called in support of the plaintiff's case to identify a discoloured print which he had returned to the plaintiff, and this closed the plaintiff's case.

The defendant's counsel, in opening his case, said the defence



was that many other photographers had purchased these cards, and made no complaint, and he contended that the defect complained of was due to some improper manipulation or management of the prints by the plaintiff.

The defendant was called, who said he had supplied 50,000 of these cards, but had no complaint except from plaintiff.

He produced a card which he said contained a larger proportion of oxide of iron than those of the plaintiff, and on which was mounted a photograph in good condition. He said he had experience as a photographer, and discolouration often arose from bad manipulation.

In cross-examination, a discoloured photograph being shown to him, he said it arose through dirty fingers in touching, and that oxide of iron coming in contact with silver would not produce the defect complained of.

Mr. Henry Styles, a photographer, was called for the defence, and produced photographs mounted on defendant's cards, which showed no defect. He said that as to the torn print, the difference between the two cards was accounted for by their being toned at different times. The witness rubbed off with his handkerchief some of the spots. Other witnesses were called who deposed to having bought quantities of cards of defendant, and had no reason to complain of them. One of these said the marks might have been caused by pyrogallic acid; others that they might have been caused by bad manipulation, and others careless work.

His Honour, in deciding in favour of defendant, remarked that there was no evidence that the cards could have been made without oxide of iron, and that although the plaintiff alleged the injury to the prints was due to the oxide of iron, the defendant's evidence showed that the defects might be caused from bad manipulation; and that as other persons had bought large quantities of his cards which they had used without injury to the prints, on the whole he thought the plaintiff had not made out his case.

#### NOTES FROM NEW YORK.

THE BOSTON EXHIBITION—A LARGE DISPLAY OF PHOTOGRAPHS BY AMATEURS—AWARD OF DIPLOMAS—LANTERN EXHIBITION—THE BOSTON CAMERA CLUB—EXHIBITS AT THE BOSTON EXHIBITION.

The second joint annual exhibition of the Philadelphia, New York, and Boston Photographic Societies, held at Boston, Mass., has come and gone, and has shown that amateur photography is still in the lead of professional work, particularly in regard to its artistic side. The exhibition was held in the Boston Art Club's gallery, a room about fifty feet square, very perfectly lighted and arranged. Admittance was free, but by special arrangement the rules relative to labelling the frames was suspended, and no knowledge of the titles of the pictures could be obtained, except by the purchase of a catalogue. It was expected that the profit on the catalogue sales would compensate for the running expenses of the exhibition, which in a great measure, I am informed, was the case.

The weather during the week of the exhibition was very unfavourable, yet it is said the total attendance was over six thousand, which indicates that in Boston, at least, photography has special attractions. Every evening well-conducted short lantern exhibitions were given, which drew crowds, and filled the large room. Mr. Wm. Garrison Reed operated his specially constructed lantern, arranged with an automatic muslin interceptor to cut off the light somewhat quicker during the change when dissolving from one light to the other, while Mr. Edward F. Wilder read the titles of the pictures. On one evening, subjects illustrative of New York were shown; another evening, Philadelphia; another, Boston; and on a fourth evening a miscellaneous assortment. Every evening the prize set of lantern slides was displayed. The only unpleasant feature about the evening exhibition was the lack of temporary seats, the majority of those in attendance having to stand while the pictures were exhibited.

Going up the circular stairs to the main entrance of the Art Club Room, were to be seen, hung on a light walnut

frame on the left of the landing, the transparencies for the exhibition, some of which were remarkably fine; but they were so poorly lighted (the window for illumination being partially stained glass, and so far away) that their beauty could not be readily observed. In the evening, illumination was obtained by a gas chandelier somewhat dim and poorly located. It is rather strange, considering that the gallery is so beautifully lighted at night by electricity, that a better device, illuminated by the same agent (as it could easily have been done), was not improvised.

On entering the main entrance one was struck with the multitude of small pictures, and a general rigidity, if that word may be used, of the framing and the hanging of the frames. There appeared to be no marked variety in the frames or in their manner of grouping. Aside from this, it was readily observed that the room was too small for so many pictures, for several frames of small sizes were hung above one's head, making it impossible to see their technical merits without the use of an opera glass; while on the other hand, nearly a dozen frames had to be set on the floor. Past experience has shown that to properly see photographs of small sizes, they should be comprised in a belt about four feet wide, the centre of which should be about four and a half feet from the floor. They necessarily require more space than paintings, hence more care should be observed in regard to hanging. In this exhibition it is quite evident the committee had a superabundance of small work to hang, and were compelled, for want of space, to put some of it as high as eight or ten feet from the floor. It was also noticeable that some exhibitors, disregarding the advice of the committee, requesting that a few choice pictures be sent in preference to many, contributed a very large quota, one sending as many as a hundred and seven. In order that justice may be done to all exhibitors, and that the committee may not be embarrassed, it would seem desirable that the number of a certain size or sizes of pictures any one exhibitor may contribute, be limited. Such a plan might very materially reduce the total aggregate of pictures, but it would allow more space for their proper display, and add much to the enjoyment of looking at them.

The experiment of hanging the pictures without labelling was quite an improvement; the frames looked much better without labels; but as each exhibitor's exhibit was scattered here and there, it became a tedious matter to search through the catalogue to find the subjects. It showed that this system will not work perfectly, unless each exhibitor's exhibits is hung in a group by itself, as was done at Philadelphia in 1886, or after the frames are hung they may be numbered consecutively, commencing at one point in the room, and going around in regular order. The numbers in the catalogue should then be made to correspond. No doubt this latter plan would entail a large amount of work. The system of grouping each exhibit as far as possible by itself appears to be the best, and is easily catalogued.

Reserving comments on the individual exhibits for another time, I give herewith the list of awards of diplomas as officially announced:—Class 1 and 14, Landscapes over 6½ and 8½ inches in size and Transparencies, two diplomas to Prof. H. A. Rowland, John Hopkins University, Baltimore, Md.; Class 2 and 8, Landscapes 6½ by 8½ and under, and Animals, two diplomas to Frank M. Sutcliffe, Whitby, England, also for Class 2, one diploma to John P. Gibson, Hexham, England; Class 3, Marine Views, Surf, and Class 15 for best set of Lantern Slides (negatives and slides made by exhibitor), two diplomas to H. A. Latimer, Boston, Mass., member of the Boston Camera Club; Class 6, Figure compositions, 6½ by 8½ and under, also Class 8 Animals, two diplomas to George B. Wood, of Philadelphia; Class 11, Interiors, one diploma to Miss Annie L. Richards, Boston, Mass.; Class 13, Instantaneous effects, one diploma to David Pepper, Philadelphia, Pa.; Class 16, Set of six to twelve pictures by a foreign exhibitor or taken in a



foreign country, one diploma to John C. Lee, Roxbury, Mass., member of the Boston Camera Club; Class 17, by any new process not before publicly exhibited, one diploma to Henry H. Supplee, of Philadelphia, Pa. (magnesium flash-light pictures); Class 18, pictures not otherwise classified; micro-photographs, sculpture, &c., one diploma to Dr. R. R. Andrews, Cambridge, Mass., member of the Boston Camera Club (there were nearly six lantern slide photo-micrographs of growth of human teeth); special Ladies Class, one diploma to Miss Catherine Barnes, Albany, New York. Altogether, fifteen diplomas were awarded; the classes in which no awards were made were Marine Views, Sail, Figure Compositions over 6½ by 8½, Portraits, Still Life, Architecture, and Enlargements.

Probably the most attractive pictures in the Exhibition were Professor H. A. Rowland's Norwegian Views, Frank M. Sutcliffe's studies, and Mr. Rudfield's figure composition, entitled "Victuals and Drink."

The New York and Philadelphia exhibits were displayed at the rooms of the New York Society on Friday evening and all day Saturday, May 18 and 19.

On Friday evening the 18th, a special Lantern Exhibition of the slides contributed by the Philadelphia Society to the Slide Interchange was given at the rooms of the New York Society, comprising eighty-seven slides contributed by the Society, and about thirty others miscellaneous in character. Of five views in India by Mr. C. R. Pancoast, those entitled the "Tomb of Nizam-ud-din Alayia, at Delhi," interior of the "Pearl Mosque," and "Elphanta Caves," were much admired. There were also five views by Mr. George Vaux, Jr., made from film negatives, the most interesting of which was the picture entitled "Waivona (Tunnel Tree) Mariposa Grove" in California. It represented a waggon-load of children passing through, and was beautifully clear and crisp.

A slide named "Church and Castle," made by the Taupenot process, by Ellerslie Wallace, jun., was quite peculiar in tone, and very pleasant to look at. He also had an excellent view of Albrecht Durer's house at Nuremberg. John Bartlett's original studies next followed, and were all greatly appreciated: "Learning to Read" and "Old Cronies," the latter representing two old women talking in front of a fireplace, were especially fine. "Mill Creek" and "Darby Creek," particularly the latter, by Mr. E. W. Keen, were beautifully done and specially artistic. Among the other fine views contributed by Mr. Ellerslie Wallace, jun., were "Hotel Goldenes Dachl" and "Theresien Strasse," at Innsbruck, Switzerland; the latter had for a background a high precipitous mountain, white with snow at the top, against a dark sky. His "Schloss Stock Alper and Valley of the Rhone" from Brieg, Switzerland, was superb, the round stone towers of the church in the foreground standing out against the distance backed by mountains. Four slides by J. H. Burroughs, two of which were much admired, entitled "Watkin's Glen, Glen Cathedral," and "Smooth runs the water where the brook is deep," displayed his artistic knowledge in respect to landscapes to good effect. Some views of Southern life, by R. T. Hazzard, were well done—one, entitled "The Solid South," exciting much mirth, as it represented a lot of little darky children seated in front of an old shanty. His view of "Loading Cotton, New Orleans Levee," was very good, also his Georgia "Ox Teams." "The Old Fisherman," an old man having a young darky in a wheelbarrow, by W. D. H. Wilson, was particularly good. He had others of merit also. Views of Castles in Wales and France, and "Ann Hathaway's Cottage at Shottery," by F. F. Fassitt, were remarkably clear and artistic. William H. Rau's work was quite effective and pleasing: his "Surf-bathing at Atlantic City" was full of spirit, and his "Lion in the Philadelphia Zoo," President Canfield regarded as superior to anything of the kind he had ever seen. The lighting was perfect, while the position, detail, and crispness were superb. His views, entitled "Rain-

bow Falls in Winter," and "Frozen Cascade," both at Watkin's Glen, were remarkable ice pictures, and were loudly applauded. John G. Bullock's pictures, embracing a pretty view entitled "Ripplemead Ferry, Virginia," "An Idle Moment," "A Wayside Chat," were excellent studies in their way, and illustrated how the commonest subjects oftentimes make the most pleasing pictures. In W. H. Walmsley's four slides were two that were gems: one entitled "A Cypress Swamp on the Chickahominy," and "Avondale Crum Creek;" the latter was exquisite in perfection of detail and artistic effect, besides being soft and pleasing. John Carbutt contributed several views of instantaneous effects such as "Page making his high jumps," and Tom Wray, pole vaulting." They were excellent specimens in their way. His plant views, made on orthochromatic plates, were also good. Robert S. Redfield's beautiful work appeared near the close of the exhibition; his studies "Great Expectations," a boy fishing; "Blowing Bubbles" and a "Virginia Forge" were very much liked, while his "Spiked Team" and on "Brandywine Creek," showed splendid taste and artistic feeling. The set of slides ended with a few more India temple views by C. R. Pancoast, which were fine specimens.

A few slides by members of the New York Society followed; those best liked were entitled "Evening on the River," by Walter A. Singer, "Ducks Racing," by Mr. Murray; "The Batter," by W. H. Stebbins, jr., representing the ball in the air just after it had left the bat, and "Young Viennese Ladies," dressed in light but special costumes, in the act of "fencing," taken instantaneously, by Mr. Chas. Simpson.

Then the exhibition terminated with the slides sent to the Boston Exhibition by George Marshall Allen; his "Midnight Sun View in Alaska" being one of the best, and a set of eighteen slides sent to the same exhibition by Robert S. Redfield, several were fine views of the United States Navy, "Men of War Vessels," and instantaneous views of the military parade in Philadelphia last year. His "Victuals and Drink" picture was specially good, as also was one called "Loitering," and "A New England Watering Place;" this latter showed most excellent judgment in the location of the principal subject in the picture, a white horse, and perfection in technical qualities. The lantern was worked by Messrs. Singer and Simpson, assisted by Mr. Beach, while the subjects were announced by President Canfield. The New York and Philadelphia exhibits of photographs returned from Boston hung on the walls, and were greatly admired.

The Philadelphia set of slides were considered to be the best of any contributed to the slide interchange. The subjects were interesting, and the slides as a rule beautifully clear and crisp. It is presumed that many of these were made by Wm. H. Rau.

In reviewing the work shown at the exhibition it may be well for convenience sake to consider first, the exhibits of representatives of the exhibiting societies. Beginning with the work of members of the Boston Camera Club and residents of Boston, I find in William S. Briggs' exhibit, two pictures of merit, one entitled "Boulder on Cascade Creek, Waterville, N.H.," another "Old Parsonage at Norwood, Mass.;" in the latter the foliage was finely rendered. Most of his others were a trifle hard, indicating addition of too much pyro to the developer. W. G. Preston's picture called "Old Father Time," showing a man in the act of mowing, was particularly striking, the position of the arms and body being excellently caught. In frame No. 29, among miscellaneous views by William O. Witherell, was one entitled "View in Woods at Clarendon Hills," which showed splendid shadow effect; it was soft, clear, and fully developed. His frame No. 30, of five interiors, was on the floor. Arthur L. Plimpton displayed four frames of excellent work. A 6½ by 8½ picture called "A. B. Turner's Four in Hand" was beautifully clear, the horses were distinct, and the detail in the shadows was well brought out. Most of his other pictures were 5 by 8 in



size; those in frame No. 78 were very clear and crisp. Of the eight frames sent by Frederick D. Stacpole, that of No. 80 was the best, showing a group of sheep in the foreground, and entitled "Old House at New Castle, N.H." Most of his pictures were not sharp, and looked as if the negatives were too thin. H. F. Hamilton had a frame of Boston street views (4 by 5) No. 90 on the floor, which were fair specimens of detective work, though his other frame of carte-de-visite portraits of children was better in its way. Miss A. L. Richards, though not a member of the Club, was a prominent Boston exhibitor, and was awarded a diploma for interiors. On what grounds the diploma was awarded I am not informed, but in critically examining the interiors, I should judge one was slightly over-exposed and the other only fair. There were pictures in this class shown by other exhibitors of much superior merit. Her "June Sunset" was admirable, showing a beautiful reflection of clouds in water, and excellent technique in development. In the photo called "Porch of a Summer Cottage" was displayed good ability in bringing out the delicate detail of the leaves overhead, the lighting of the lady seated on the porch, and the position of the dog beside her. Five long narrow frames of small detective camera pictures by W. S. Edwards were fair, the snow views in frame No. 94 being, perhaps, the best. Geo. H. Eaton exhibited forty-five specimen portrait pictures, in a frame about five feet square, all made under the Camera Club skylight. One large portrait (10 by 12) of a standing figure of a lady in bridal costume was admirably done, well lighted, soft, showing exquisite detail in the delicate laces draped over the white dress. While this exhibit may not have struck the artist judges as having any special merit, it certainly did appear to the average photographic critic as one possessing several striking good qualities, since the entire work was by the exhibitor. His excellent and neat way of mounting is also to be commended. It was by all odds the best specimen portrait exhibit of an amateur that was to be seen in the exhibition. In Francis H. Richards' (not a member of the Boston Club) exhibit, nothing of special merit was seen. Henry G. Peabody (also not a member) had a frame of four  $6\frac{1}{2}$  by  $8\frac{1}{2}$  views joined together at their ends, and called "Panorama of Beacon Hill, and the Back Bay, Boston": it was very well done. Chas. H. Currier's four frames contained excellent work; his "Lawn Tennis Group" was one of the best in the exhibition, while he had a fine instantaneous (8 by 10) view of the surf dashing on the rocks at Nahant, and also some splendidly clear, soft, sharp, and well-lighted (8 by 10) interiors. Among his cabinet portraits were three cute baby pictures. Treasurer Wm. G. Reed exhibited some good bromide enlargements, those entitled "Kearsage Brook up and down Stream" being the best; the size was 18 by 22. His "West Channel of the Saco River, North Conway, Mass.," was an admirable subject, but was not brought out quite dark enough; the whole picture looked a little too snowy. Nothing striking was noticed in John A. Well's exhibit. He is not a member of the Club. Secretary Edward F. Wilder displayed a number of small views taken in New Hampshire and Vermont, presenting a large variety of subjects. Mr. Wilder's ability as a careful worker was fully proved by the excellent technical qualities shown in his pictures. His bromide enlargement from a  $3\frac{1}{4}$  by  $4\frac{1}{4}$  negative of "Fairlee Pond," Vermont, was beautifully done, the pretty reflection of trees in the water adding materially to its charm. One large frame by Wilfred A. French contained a number of fine clear photographs. His 11 by 14 central picture entitled "King of the Forest" was particularly good, also a  $6\frac{1}{2}$  by  $8\frac{1}{2}$  called "Oak at Sudbury, Mass.," a fine tree road side study. His marine views were excellent, one representing Jay Gould's steam yacht "Atlanta" following the victorious "Mayflower" on the home stretch was specially spirited. Of Philip Manchester's three pictures, that entitled "Woods at Newton Upper Falls" was the best, showing pretty

effect of sunlight and shadow on the snow. John C. Lee, who was awarded a diploma for the best set foreign views, exhibited some good work. His "Russian Church, Dresden," was very handsome and of superior technical excellence, while his "April Shower" at Interlaken showed nice cloud effects. "Young Musicians" at Antwerp was cleverly done and remarkably clear. His  $6\frac{1}{2}$  by  $8\frac{1}{2}$  picture of a yacht (Gretchen, off Egg Rock, was spirited, and nicely located on the plate. J. Prince Loud exhibited some peculiar coloured carbon pictures. "Charles River South Natick," by Henry N. Sweet, were very pretty bits, the foliage being finely rendered. His frame of "Detective Shots" was on the floor, but showed good work. He had four excellent yacht pictures. Portrait of a child (bromide enlargement) by Walter Jenny was fair. President Geo. Cabot had a frame of excellent landscapes in Keene Valley, Adirondacks; one particularly was noticeable for its fine cloud effects.

The review will be continued in my next.

New York, May 26, 1888.

SULPHITE.

## LAW FOR PHOTOGRAPHERS.

BY S. J. DEBENHAM, SOLICITOR.

### CHAPTER III.

#### *Servants and Apprentices.*

THIS subject seems to come next in order for our consideration.

There is a great difference in the position of a master towards a servant, and towards an apprentice.

Both are equally bound to serve him, but he is under special obligations towards the latter, and must be careful in entering into engagements, and signing apprenticeship indentures. For instance, a contract may be made by a servant to serve his master for a given time which does not bind the master to employ him for that time, but apprenticeship indentures are always reciprocal, and require the master to employ the apprentice during the specified time; not only that, the deed must be strictly followed; and should the master find it necessary to remove or sell his business, the existence of such indentures in the ordinary form may be found an obstacle.

Again, the master is bound to find medical attendance for an indoor apprentice, which he is not for a servant; and he cannot, if the usual form of the indenture be adopted, discharge the apprentice for misconduct. It is desirable, therefore, in the master's interest, to insert such a stipulation. The subject of discharging a servant without notice will be treated presently.

In using the word "servant," it is understood that all employes are included—the operator, retoucher, printer, waiting or reception room attendant, and errand boy.

A contract for the hire and service of a clerk or servant need not be in writing, unless by the terms of the bargain the employment is to extend beyond a year, in which case a written agreement is necessary under the 6th section of the Statute of Frauds, 29 Car. II. s. 3.

Every person of full age, and not under any legal disability, is capable of being either master or servant, but it is necessary that at the time such a contract is entered into, the party about to be hired should be free from any other engagement incompatible with that which he is about to make. Persons under age (21) are, in law, infants, and though infants labour under a general incapacity to enter into absolutely binding contracts with other persons, they may make some binding contracts, i.e., contracts for their benefit. A contract of apprenticeship is generally regarded as for the benefit of an infant, and therefore he may make such a legal binding contract. If he could not, there could not be any binding apprenticeship at all, for a father has no authority to bind his child an apprentice without the child's consent.

The reason why the father is generally joined is because an action of covenant cannot be maintained against the



infant for not serving; and the father is sometimes made responsible for damages caused by the apprentice.

A contract of hiring and service made by a father on behalf of an infant is binding.

A servant can be discharged for misconduct without notice, even without stating what the misconduct is; but of course, it must be grave enough to justify such a proceeding, in case the servant should take legal action to recover damages.

He may be thus discharged if he wilfully disobey any lawful order of his master, or unlawfully absent himself from work; or if (in the case of an indoor servant) he be guilty of moral misconduct, or if he be habitually neglectful of duty; or if he prove incompetent to render the service he was specially engaged to perform, or refuse or neglect to render it.

He is not entitled to wages from the day of such discharge, if they had not then become due.

Where the payment is to be quarterly, or yearly, or at any fixed period, and the servant improperly leaves his master, or is guilty of such misconduct as to justify his discharge during the currency of such period, he is not entitled to wages for any part thereof, even to the day he quits it.

Another class of persons who are not what the law calls *in jure*, comprises married women.

The great authority on the law of Master and Servant (Manley Smith) says: "A married woman is in general incapable of entering into any contract which will be binding upon her at law. . . ." "In entering into contracts, she is generally regarded as the agent of her husband, and he will in general be bound by her contract."

The Act of Parliament now governing contracts by married women is the Married Women's Property Act, 1882, s. 1 which enacts as follows:—S. 2. "A married woman shall be capable of entering into and rendering herself liable in respect of and to the extent of her separate property on any contract, and of suing and being sued thereon in contract or in tort, or otherwise, in all respects as if she were a *feme sole*, and her husband need not be joined with her as plaintiff or defendant, or be made a party to any action or other legal proceeding brought by or taken against her; and any damages or costs recovered by her in any such action or proceeding shall be her separate property, and any damages or costs recovered against her in any such action or proceeding shall be payable out of her separate property, and not otherwise."

"Every contract entered into by a married woman shall be deemed to be a contract entered into by her with respect to and to bind her separate property, unless the contrary be shown." The remedy for breach is either by injunction or damages, and to pursue the first to its ultimate result would be to resort to personal attachment, while the second is now held only to be available by execution if the married woman had separate estate (1) at the time the cause of action arose, (2) at the time the action is brought, and (3) when the judgment is given, or afterwards. The safe course to pursue is to join the husband as a party to the contract, especially as the Chief Justice now holds that marriage raises no presumption of agency.

To whom should the wages or earnings of a married woman be paid? Formerly, to her husband. The "Married Women's Property Act 1870," however, first enacted that she should be entitled to receive them; and the "Married Women's Property Act, 1882," proceeds as follows:—Section 2: "Every woman who marries after the commencement of this Act (January 1st, 1883) shall be entitled to have and to hold as her separate property and dispose in the manner aforesaid (by will or otherwise) all real and personal property which shall belong to her at the time of her marriage, or shall be acquired by or devolve upon her after her marriage, including any wages, earnings, money, and property gained or acquired by her in any employment, trade, or occupation in which she is engaged, or

which she carries on separately from her husband, or by the exercise of any literary, artistic, or scientific skill."

Section 5: "Every woman married before the commencement of this Act shall be entitled to have and to hold and dispose of in the manner aforesaid as her separate property all real and personal property, her title to which shall accrue after the commencement of this Act, including any wages, earnings, money, and property so acquired by her as aforesaid."

#### *Restraint of Trade.*

It frequently happens that on engaging an operator it is required of him that he shall enter into an agreement that on termination of the engagement he will not carry on a similar business or enter into an engagement with another master within certain distances and a given time, though I believe the latter part of the arrangement is not always made.

Care must be taken, however, that the prohibition is not too stringent or sweeping. In one case it was held that an agreement not to carry on the business of a surgeon within ten miles for fourteen years was good; but it is probable that this latitude would not be much extended. The objection to too sweeping and rigid a prohibition is, that it is bad, as being against public policy, being in restraint of trade; but considerable indulgence is shown to such contracts. Chief Justice Erle said: "It is for the benefit of the public at large that contracts for the partial restraint of trade should be enforced, for if they were not, the employer would have to be uncommonly scrupulous as to whom he employed; if he had no means of keeping in check those he employed to conduct his business, and ensuring that they would not injure him by leaving his employment and transferring the knowledge they acquired from him, to his injury, to some rival in the trade. It appears to me most desirable that those who enter into such service as this should be at liberty to make contracts which give security that they will not use the knowledge that they acquire to their employer's injury." In a like case Chief Justice Tindal said: "A better test cannot be applied to the question, whether reasonable or not, than to consider whether the restraint is such as only to afford a fair protection to the party in the interests of whom it was given, but not so large as to interfere with the interests of the public."

A contract by a solicitor who sold his business not to practise for twenty years in Great Britain, was held good; but it was held that a somewhat similar prohibition in the case of an employé was too rigid.

The latest case decided is that of *Baker v. Hedgecock*, 29th May. In this case, the plaintiff was a tailor in Holborn, and the defendant his late foreman cutter. The agreement had stipulated that the latter should not, after leaving the plaintiff, enter the employment of anyone in that business within a mile of the plaintiff's shop, or engage in any other business within the same distance. It was formerly held that the Courts would assist the plaintiff by enforcing so much of the covenant as might not be illegal (in restraint of trade); but the judge, in this case, refused to divide the covenant, and refused the injunction on the ground that the latter clause vitiated the whole.

#### *Employers' Liability.*

The employer is liable to damages for injury done or damage caused by the servant if within the scope of his employment; but is not liable to one servant for injury done by another except under the Employers' Liability Act, presently mentioned. To make the master liable, the injury must have arisen while in his actual service. The following case is an illustration.

The defendants having begun sinking a shaft in their colliery, for which purpose they had fixed an engine near the mouth of the shaft, agreed with W. to do the sinking and excavating at a certain price per yard, W. to find all labour, the defendants to provide and place at his disposal an engineer to work the engine (who was employed



and paid by the defendants), the engine and engineer to be under the control of W. The plaintiff, who was one of the men employed and paid by W., while working at the bottom of the shaft, was injured by the negligence of the engineer. It was held that though the engineer remained the general servant of the defendants, yet being under the orders and control of W. at the time of the accident, he was acting as the servant of W., and not of the defendants, who were, therefore, not liable.

The "scope of a servant's employment" is what is strictly within his duty. In the following case the master was held not liable.

The defendant's carman, without his master's permission and for his own purposes, took out the defendant's horse and cart, and on his way home negligently ran against the plaintiff's cab and damaged it. The carman had with him two empty casks which he had picked up at a public house, for the purpose of bringing them home to his master, who allowed him a gratuity of a penny each for collecting them.

By a comparatively recent Act of Parliament, employers have been made liable to their servants or workmen in damages for injuries sustained by the latter while in the employment of the master. This Act is the Employers' Liability Act, 1880.

(S.1) By this Act compensation may be awarded (by action brought in the County Court) to a workman, not exceeding in amount three years' wages, for any injury suffered by him (1) through any defect in the ways, works, machinery, or plant, used in the employer's business; (2) through any negligence of any person in his employer's service in superintendence; (3) or of any person in the same employ, to whose orders he was bound to conform, where such injury resulted in consequence; (4) through the act or omission of any person in the employer's service, done in obedience to rules or instructions.

Other sections of the Act regulate the procedure. One important section is 4, which directs notice to be given to the employer within six weeks, and the action commenced within six months. By s. 6 the action may be removed into the superior Court under certain conditions.

There has been a mass of litigation under this Act, and my experience is that the general leaning is in favour of the workman. However, there is a Bill (in fact, there are two) now before Parliament to amend this Act which may shortly become law, and therefore I will not enter further into the subject at present.

There are various matters connected with the custom of the City of London which qualify the above general remarks, as dealing with infants, apprentices, and married women in the City.

## THROUGH JAPAN WITH A CAMERA.

BY W. K. BURTON.

### CHAPTER I.—TOKIO.—THE OBJECTS OF THE JOURNEY

I WRITE this about ten days after returning from a tour through the interior of Japan, which occupied about six weeks of time.

The country of Japan is one which is exciting so much interest in the West just now, and is in real truth one so exceedingly interesting, that I think no apology is required for giving an account of what I experienced, and of some of the things I saw "in the interior."

I took a small camera with me and made a number of exposures, but, for reasons which will be explained hereafter, the results were not as good as they should have been. This is of less consequence, however, as I have, almost everywhere, been able to get excellent photographs of the most notable objects done by Japanese photographers, and as my object in writing is by no means to exhibit my own skill as a photographer, but rather to try to give an account of a country which, from its total difference from our own, is well worth knowing something of, I have no hesitation in making use of these photographs.

Some apology is perhaps necessary for the personal way in which I write, but considering this matter well, I have concluded that I can convey to readers the impressions made on myself better by a purely personal narrative than in any other way. I shall try to avoid all accounts of incidents purely personal, except those which appear to me to illustrate the peculiarities either of the country, or the conditions of life or manners of the people.

A word first as to the object of my travels, and of the circumstances in which the journey was made.

The time was holiday time, the summer vacation, a time when all foreign dwellers in Tokio who can possibly manage it, fly from the fearfully damp heat of the summer months of that city to parts which may be cool, and will at any rate not be so damp (as it sometimes is here) that mould appears on one's boots a few hours after they are blacked. I returned to this sort of weather a week ago. I leave the reader to imagine how one feels with the thermometer at 90° or even at 80°, and with the atmosphere so completely saturated with water as I describe. To-day the expected change has come quite suddenly. The air is dry, and although the temperature is really higher than yesterday, the difference in one's sensations is indescribable. Yesterday to make the pen crawl over the paper seemed an exertion almost past endurance; to-day it runs almost of its own accord.

The journey was made, in the first place, to get out of this unbearable heat; in the second place, to gain some knowledge of the sanitary condition of some of the towns in Japan; and the camera was, truth to tell, only of third-rate importance.

The fact, however, that the journey was official or semi-official resulted in my seeing far more of the customs of the Japanese than I should have, had I been merely on pleasure bent. I had with me, as travelling companion, a medical doctor, who is an executive member of the sanitary bureau; and, as interpreter and assistant, a graduate of the college of engineering. As I may have to mention them hereafter, and as I am sure, if they ever see this, it can give them no offence, I give their actual names: Dr. Goto and Mr. Nagasaki.

Tokio is on the East coast of Japan, about half-way between the Northern extremity and the Southern. The route we decided on was briefly as follows. We arranged to go by steamer to the North of country—To Yezo, in fact, an island North of the mainland altogether—and from there to make our way through the interior of the Northern half of the island, calling at all the large towns.

Before we leave Tokio I must give the reason for the non-success of a great number of my own exposures.

Before I started I was expecting daily the arrival of a box which, amongst other things, was to contain a few boxes of plates. I had, just before starting, the following plates on hand of the size I wished to work: one dozen of my own make, and two dozen which had been given me by Mr. Ripley of New York.

My own plates were good enough, but were not suited to a temperature of over ninety in the shade; as a consequence, I lost the first three that I developed, the film melting off before I knew what had happened. The others were saved by the use of ice, and made good negatives.

Of Ripley's plates the following has been the fate. One dozen were exposed, and turned out to be of the highest quality, giving the best negatives I have got. The other dozen were said to be of extraordinary rapidity, and fortunately I had exposed two of these before an accident happened to the others, and can certify that they were of very remarkable sensitiveness, giving very fully exposed negatives of street scenes with drop shutter exposure of about 1-12 second at  $\frac{1}{16}$ .

The rest of the plates were spoiled, the jinrikisha riding over country roads having one day broken open the box. Of course I have no one but myself to blame for not having packed them better, and can only say that jinrikisha riding



in Tokio had given me no idea of what such riding would be in the country.

The expected box did not arrive, and I found it necessary to buy what plates I could in Yokohama. I found that the only plates of the size I wanted ( $6\frac{1}{2} \times 4\frac{1}{4}$ ) were some by a San Francisco maker. And what plates they were! If I felt certain of what I believe—namely, that this San Francisco maker had purposely sent to Japan a batch of plates that had turned out bad, thinking that it was so far a country that the selling of the bad plates would not injure his reputation; if I felt sure of this—I should give him such an advertisement as he would not be likely to forget. As it is, I take the most charitable view of the case I can (it is just conceivable that the plates have been spoiled since they left San Francisco), and conceal his name. If this ever meets his eye—he is sure to be self-conscious enough to know who is referred to—let him know that the least I consider he should do, in the way of compensation for his sins, is to send a number of good plates. I have heard that he can make good plates, but those I had were simply vile. They were slow, yet had all the faults in the way of thin image, tendency to fog, &c., of rapid plates, and, moreover, they were simply covered with insensitive spots of all sizes. Not hopeful plates to carry to the country.

## “NOW AND THEN.”

### DISCURSIVE NOTES.

BY EDWIN COCKING.

RESUMING our researches into the work made known at the early meetings of this Society, we next come upon the subject of cameras, which was brought before the notice of members at their third meeting, in 1853. Many ingenious methods were then shown for placing the paper (for negatives) in the exact place previously occupied by the ground glass; but the most interesting was the one designed by Mr. N. Storey Maskelyne, where a box containing prepared paper was attached to the camera, and a dark cloth fastened over the back, under which the hands were inserted to enable the fingers to move the front piece of paper (kept in contact with a sheet of glass by a mill-board placed behind it) into the place previously occupied by the focussing screen, and the exposure was then made. This paper, moved by the fingers under the cloth, was then placed at the extreme back of the box, and another piece brought forward. Here we find the original idea which has cropped up again very recently, when dry plates could be packed close to each other like sheets of paper.

A very singular statement appears respecting cyanide of potassium upon its introduction for fixing glass positives. It is this:—“A competent person has assured me (M. Gaudin) that a dose of  $7\frac{1}{2}$  grains has been administered internally without any inconvenience.” Probably very few have since experimented in this direction; but a question suggests itself which may possess some interest in being answered: “Whether more harm has not accrued from the breathing of ammonia now than took place when cyanide was used?”

We then come across an outcome of the suggestive faculty in the matter which has exercised much art instinct ever since. Latimer Clark, who had just previously made known his plan for making stereoscopic negatives by a single lens, sends to the *Journal* the method he had devised for a “very nice variety” of printing positives on paper, “with the image gradually shaded off to nothing;” it is singular that although in art this mode of working was called “vignetting,” no allusion to this name was then made; and it is also startling to find that the bottle-jack was mentioned at the same time as a motor power for circulating a number of frames, and thus causing this diffused method of printing to keep going all round the subject. This early introduction of a domestic article marks the starting point of that utilization of anything and everything which characterises the photographic world, and just then there was nothing old, or had been used before, so that necessity stimulated and set in action mechanical skill.

It would appear that many of the clever applications with which photography could be associated were found out in the early history of the Society. In March, 1854, M. Duppa exhibited some positive paper photographs made transparent, and coloured at

the back, producing what was said to be “a very perfect imitation of an oil-painting.” Some little time afterwards the *Journal* contained an extract from a French periodical of a method of colouring photographic pictures by M. Minotto, in which many ways were suggested for producing a good effect by colour applied to the back of transparent photographs. In the September *Journal*, 1854, the editor writes that M. Duppa had taken out a patent for his process, and then goes on to say: “The desire to monopolise appears to have gone beyond legitimate boundaries in this and certain other cases we have heard of; surely such a patent must have been granted by an oversight.” About thirty years afterwards the Society's *Journal* again contained a description of similar work, which was brought before one of the Technical Meetings; and thus, in this small cycle of time, history repeats itself. If this be so, at the end of the second decade of the next century the rising generation may probably have the same startling matter re-discovered. It appears that this system of colouring was first practised and patented in Germany in 1824, and was then applied to lithographs.

In May, 1854, there appears in the *Journal* a description of a plan called “The Use of Gelatine as a Photographic Vehicle” for coating glass with gelatine, to be used wet for negative work, which is stated to be “rapid and certain in its results;” and at this early stage of experimenting with gelatine and silver combined (the initial germ of the modern process), it is stated, and it reads almost as if it were a direction of yesterday: “Whilst the developing solution is on the plate, it must be kept constantly in motion.” From this pioneer experiment, it took nearly a quarter of a century before the outcome of such a combination could be fully made a joy for ever; and, looking back from our modern, far-searching experimental tendencies, there seems then to have been a curious hesitancy in experiments, associated with an idea that they never could arrive at the complete fulfilment of their most sanguine expectations, for certainly one would have thought that when “rapidity” was claimed for this primary gelatine process, that at once it would have experienced any amount of introduction to other chemical materials and experiments, for we go on to December, 1856, when a paper was read by Dr. Hill Norris, wherein he stated that he immersed his collodion plates in gelatine before drying them, and then writes, “Whether or no dry plates will ever be obtained as sensitive as moist ones is at present an undecided point”; and even for his own dry plates at that moment he stated the exposure was double that of wet.

Respecting isochromatic photography, which has now become so interesting, very little appears in the early history of this Society to make any comment upon, but there is one matter bearing on this subject which is worthy of being alluded to. Sir J. F. W. Herschel, June, 1853, wrote: “The rays beyond the luminous ones act powerfully, and these must be eliminated; a glass screen with a very slight tinge will effectually cut off these;” and he then alluded to Professor Stokes' experiments with sulphate of quinine enclosed in a glass cell as being equally as good for the same purpose.

This Society quite recently has had brought before its notice a printing process by development, which, it is stated, possesses two important qualifications, viz., rapidity and permanency. Here again the early journals of the Society contain repeated allusions to a method of printing by development, in which again “gelatine” plays a leading part, and it was the same Sir W. J. Newton, already alluded to, who had been successfully working a printing process by development for some time. In February, 1856, he states that he used gelatine containing bromide of calcium and iodide of potassium. This was applied to both sides of the paper, afterwards sensitised and developed, no gold being used, alum was used after fixing with hypo; and he states, on the score of permanency, that the prints were submitted by Mr. Hardwich to a severe test, “and no great change took place.” It would rebound, then, to the further popularity of photography if developed prints should be found a matter easy of accomplishment, but it may be, after all, that it is not such an easy matter to work; experienced skill must then be brought into practice whilst printing, to rightly estimate the value of the colour arrived at, with the limited definition of delicate parts of the subject which are afterwards to be brought out more distinctly and stronger by development; and, no doubt, that herein lies the almost exclusive use of albumenised paper, as it becomes comparatively easy to work when the required amount of delicate half-tone has not to be calculated, but is actually there to be seen.—*Photographic Journal*.



## Notes.

Our contemporary, the *Scientific News*, affords us a good instance of the unscientific method. In proof of the poisonous character of pyrogallic acid, it mentions the case of a child who drank some pyrogallic acid solution, and then proceeds to draw the inference: "It would undoubtedly have perished if the father had not had the presence of mind to administer an emetic."

Chapman Jones informs us that a work by himself, entitled "An Introduction to the Science and Practice of Photography," is in the press, and will be published in a few weeks by Iliffe and Son, of London and Coventry. When we say that the basis of the work is the series of Lectures on Photography at the Birkbeck Institution, which appeared in the *PHOTOGRAPHIC NEWS* last year, we have said enough to satisfy our readers as to the value of the forthcoming book.

The amateur of to-day is not so great a trial to his friends as he used to be a quarter of a century ago. We remember an old gentleman who had retired from business taking up photography, and making a great fuss about taking anything and anybody. His pretensions were much greater than his performances, and, as a matter of fact, his attempts were invariably failures. He had, however, talked so much about what he could do, that a friend—one of those quaint old fellows who seem to have been much more common years ago than they are now—called one morning, and said he had come to be photographed. The amateur, rather taken aback, made no end of excuses—light, bath, and so on—till at last the visitor, in a huff, said he would go and get one done "without any fuss for 6d." The amateur, who was somewhat irascible, said he had better, for he would be glad to see the back of him. Away went the visitor, and returned with a glass positive which he thrust into the other's hands, observing, with a meaning look, "There, that's how you like to see me, I suppose." He had stood with his back to the camera.

Those who have travelled will understand that passport restrictions are far more irksome to those taking photographic apparatus than to the ordinary tourist, and old travellers will know what practical value to attach to numerous paragraphs in the daily papers, inspired by railway companies, and stating that passengers by certain routes and certain trains are exempt. At any rate, the result is likely to be that almost all who want to go touring in Switzerland and Italy this summer will avoid touching German territory on their route.

Public aid to scientific research very often takes the form of large salaries to officials and heads of departments, and under these circumstances one can quite understand how it is that when the Astronomer-Royal explained to the Chancellor of the Exchequer that a new refracting telescope was required for the international survey of the heavens, this functionary would do nothing more than "consider the matter." This reply is rather disgraceful to

England as a nation, when one reckons what other countries are doing in the matter.

A photograph which may be valuable to artists of illustrated papers was taken the other day at Hythe. That there happened to be a representative of every Scotch and Highland regiment present at the same time undergoing musketry training was considered so remarkable a coincidence, that the sergeants, in full uniform, representing each regiment, were photographed, thus furnishing an authority on military costume which an artist would give any money to obtain. There is nothing which bothers the artist so much as the intricacies of uniform. To sketch accurately from life is impossible, because a journalistic artist has only time to take the salient points, and fills up the rest from memory. He is generally right in the main, but nearly always wrong in the fidgetty minor points, which the expert at once spots.

A paragraph has been going the rounds of the papers that Signor Focardi, to whom the world is indebted for the statuette of "You Dirty Boy!" has set up, or is going to set up, a studio at the Italian Exhibition, and will model clay busts of the visitors; in other words, will present you with your portrait in clay while you wait. This is running the silhouettist and the ferrotypist very hard. The first is already almost extinct, but the latter is still alive. If the taste for busts should rule, somebody had better revive "photo-sculpture," which, some five-and-twenty years ago, was much talked of, especially on the Continent, and furnished much food for fun in the Parisian comic journals of that date.

A story told of "You Dirty Boy!" exemplifies the peculiarities of the artistic copyright law. Before the statuette was purchased by its present proprietors, the right of photographing and otherwise copying it was sold to a certain big advertiser. The purchasers of the statuette were not aware of this sale, and when they came to publish reproductions they found themselves threatened with all kinds of pains and penalties. The settlement was a very expensive affair, but it had to be done, because the statuette was useless by itself for advertising purposes. So, at least, the tale goes.

One feature of the deep sea explorations on the south-west coast of Ireland, it is said, will be the attempt to take photographs of the rarer animals immediately on their reaching the surface. It would be interesting to learn how this is to be done. The animals found in deep sea explorations are of a low form of organisation, and can only be seen to advantage in their native element; and as the operation is termed "an attempt," we presume that they will be photographed in water. There cannot be any difficulty in photographing them out of the water, unless, indeed, they are microscopic.

If the photograph of "Ayrshire," the winner of the Derby, published in last week's *Land and Water*, be correct, the popular notion as to the beauty and elegance of



the English racehorse must be altogether wrong. The boy's description of a cow, that it is an animal with four legs, one at each corner, applies admirably to "Ayrshire" as represented by photography. A large head, a body with no grace, and four legs like posts, so thick and straight are they, are what the photograph reveals. We are afraid the British public would infinitely prefer the racehorse of the artist to the animal as represented by the photographer. It would seem as difficult to secure a true photographic portrait of a horse as of a man.

To judge by an article in the *Melbourne Argus*, the amateur photographer has overrun Australia, and is as much dreaded as the terrible rabbit. "The amateur photographer," we are told, is "rampant in the land." He has excited the jealousy of rivals, who complain that he takes a mean advantage of his brief authority. "They say," goes on the writer, "it isn't fair that pretty maidens should require protracted sittings of hours, that they should need assistance for every pose, and that even rebellious locks of hair cannot be smoothed down except by the highly susceptible photographer himself." The author of this protest has either tried photography and failed, or is one of those unlucky persons who never "come out" well. He winds up a burst of indignation by asking, "Is it possible to imagine amore malicious method of holding up a person to public contempt or ridicule than that of inducing him, under a mask of friendship, to submit to have his portrait taken by an amateur? It is time to adopt severe measures to abate this growing nuisance. Prosecute! prosecute! Let the injured individual merely stand in the witness-box while a 'proof' of the outrage complained of is handed to the jury for comparison. No further proof will be necessary; for unless the Anglo-Saxon character has sadly deteriorated, the twelve good men and true must find a verdict for the plaintiff, with substantial damages, without leaving the box." Surely this gentleman must have been jilted in favour of an amateur photographer!

The Hawaiian Legislature has just passed an Act restricting the return of Chinese to the islands if they once leave them. The law provides that in order to obtain a permit to return, a Chinese must, among other things, deposit duplicate copies of his photograph, full face and profile views. When it has been said that a photographer in China need only take two photographs at starting—one of a fat Chinaman, and the other a lean one—and go on printing for ever after from these two negatives for all his customers, the difficult task which the Hawaiian Legislature has set itself may be imagined. It is true the precaution has been taken to insist upon two views of the face, but we are afraid this will not simplify the matter, because many will resemble the one, and not the other; and who is to have the benefit of the doubt, the Chinese or the Sandwich Islands? On the whole, we are inclined to think the photographic condition is one likely to increase the number of Chinese in Hawaii, instead of diminishing them.

## PHOTO-MICROGRAPHY.

BY A. N. McALPINE AND H. BREBNER.\*

It is not to be denied that photo-micrography is rapidly coming to the front as a means of recording the results of scientific investigation. To the zoologist, botanist, geologist, and pathologist it is an invaluable witness or registrar. Without it, evidence of the most convincing nature could not be produced, and with it the truth, the whole truth, and nothing but the truth, can be inscribed on tablets of silver and gold with marvellous celerity and precision.

It is not the object of the present paper to add one iota to the already voluminous and conflicting literature on the best and only true way to success, for the requirements of each observer are different—different as the eyes of the eagle and the fly.

Directness of purpose is, or should be, the first aim of every earnest photo-micrographer. A good copying (enlarging) photographic lens, or an ordinary magnifying-glass, will serve the turn of those who do not aim at a greater magnification than an 8 to 10 linear, while on the other hand only the most expensive and comparatively valueless objectives can be used by those who desire to temporize by combining the penetration characteristic of the highest powers with the definition of the lowest. Prettiness, consisting in the flattening out of a spherical or cylindrical object, such as *volvex heliopelta*, or the tracheal tubes of the silk-worm, is, if not an error, certainly by no means a desideratum. The workmanlike result of the well-trained microscopist and photographer is by no manner of means characterized by a result giving equal prominence to the centre of attraction and the peripheral surroundings. In fact, save in a few isolated instances, such a method of treatment indicates only an utter absence of motive. The true artist and scientist alike agree in giving emphasis to the leading idea, leaving it to the architect and clerk of the works to map an outline.

The practical microscopist generally employs the microscope as a microscope. He brings it to bear now upon a tissue, living, unmounted, in a fluid; now upon a desiccated, stained, and mounted skeleton. Habitually, he works with a perpendicular instrument, inclining the apparatus as seldom as possible. Hence, if in prospecting among the countless fields daily brought under his notice, he should come across one containing some vein possibly worth exploring and working—possibly not—it is of the utmost importance that, at once, almost without further trouble, the camera and its sensitive plate should be ready to be called into requisition.

It follows, then, if we understand the leading features of a good microscopic stand, that whatever objective we are using, and whether we intend photographing with or without the eyepiece—and the latter method is beyond all doubt the more convenient—we must have our photographic apparatus ready to hand, trustworthy, and in nowise interfering—further than is necessitated by re-focussing—with the microscope, light, subject, field, and aspect.

Ere proceeding with any details regarding the two models of a photo-micrographic apparatus before you, it may be as well to mention the more important qualities required, for it is very apparent that where the essential points are attained, the beauty and value of the resulting photograph will depend upon the perfection of the lenses employed, the judicious selection of a suitable slide or object, the skill of the operator, and the facility with which special appliances may be adapted to the apparatus.

Strength and rigidity, implying constant parallelism of the planes perpendicular to the axis, are absolutely necessary in a good photo-micrographic instrument, and the whole machine must be as accurately centred as the microscope itself. Every movement should be smooth and uniform in order to promote precision and rapidity of manipulation. Once *in situ* the microscope should never need to be removed or withdrawn from its connection with the camera, nor altered in its relative position in order to change a power or an eyepiece, or to facilitate the finding of a difficult field. As already suggested also, solid and liquid, mounted and unmounted objects should not require separate positions of the instrument, but should be photographed just as they come to hand and are observed. In addition to being readily fitted with different accessories such as the Abbé condensor, or tubular stops, it is an advantage if the apparatus is capable of being worked either by reflected or direct illumination; the latter condition forming the only case where a horizontal position may reasonably be considered preferable to the

\* Read before the Edinburgh Photographic Society.



perpendicular. In addition to the foregoing, a serviceable combination for general use should allow of a fair extension from stage to plate, while maintaining a thorough firmness. Last, but by no means least, when the light is reduced to a minimum through a high power and the maximum draw, the image should not be examined through waxed or puttied glass, but should be focussed in mid-air, without any intervening substance.

An erect photo-micrographic apparatus is no novelty, but in common with their horizontal rivals, all forms leave something to be desired, either in the way of accuracy, convenience, extension, or economy.

In the form exhibited these qualities have been particularly studied. The general construction of the instrument is as follows. Rigidly attached by its centre, and accurately by perpendicular to the (9 in. by 6½ in.) base-plate (drilled in the common axis) upon which the microscope is clamped, is either a flat quadrilateral and rectangular tube about fifteen inches long, or a couple of brass tubes, *à la trombone*. Within the single tube slides a plank or plate forty inches long, ending at the top in a flat light board or plate (9 in. by 6½ in.) at right angles to the sliding plank, and strictly parallel to the base-plate. In the case of the double tubes there are a couple of rods ending at the top in a plate of similar construction. In all other details the instruments are practically identical, and may be described as one. The upper plate has an oblong aperture the size of a quarter-plate cut in it, and alongside of this is a check to hold the dark-slide in its place. The bellows-body, with large folds to allow of great extension, while occupying but little space when closed, is attached to the under surface of the upper board, and ends in a still slighter board fixed in proper position. A small velvet sleeve keeps out extraneous light. When the camera is not in use the rod or rods are pushed down, when the eye-piece of the microscope rises through the top of the camera, and allows of the instrument being employed in the usual way, without let or hindrance, a desideratum of the highest importance. When a photograph is to be taken, the rod carrying the camera is simply run up till the proper degree of magnification is obtained, fitted at that height, the image, as explained later, is re-focussed, and the exposure may be made without farther trouble. By placing the base-plate on the work-bench or table, and allowing the rod to almost touch the floor, a much greater draw is obtainable than is the case with any of those perpendicular instruments in which the bottom of the rod is on a level with the top of the table, and though it requires a very tall man to focus, when the camera is at its utmost stretch, yet this disadvantage can be overcome as usual, either by lowering the entire apparatus, or by rising to its height. Or, when the full draw is frequently required, and the slides are prepared and mounted, the instrument may be lifted bodily and used horizontally, if this be desired, exactly in the same way as is usually done. By a second though much smaller tube sliding on the tail-end of the rod, a means of attachment is afforded for a gas-bracket, a support obtained for a lamp, or a means of regulating the amount of incident daylight ensured, in which circumstances, of course, the reflecting mirror is to be set aside.

The focussing arrangement consists of a simple magnifying glass attached to an elbowed rod which allows the glass to be brought over every portion of the image successively. The height of the magnifier above the plane corresponding to that occupied by the sensitive film when the plate is in position has been accurately determined by experiments upon a plate of glass having delicate diamond scratches on it, or a few fibres of cotton-wool adhering to its under surface. The focus (virtual) once determined, and the magnifier fixed to the board carrying the dark slide, a glass plate waxed or puttied not only becomes entirely superfluous, but is absolutely in the way. It may, however, be used the first time the instrument is employed in order to facilitate the determination of the size of the disk or image of the micrometer at various distances.

In illustration of the general capacities of the first model, and of the precision and ease with which the magnifier can focus on a selected (*Euclidian*) plane, the accompanying tabled photographs (about sixty) may be of some use. Several of the negatives, notably those showing the markings of the diatoms, *Pleurosigma Angulatum*, *Grammatophora subtilissima*, and *Navicula rhomboides*, are, though as sharp as could be wished, by far too fine to print without much greater enlargement. *Heliopelta*, however, focussed for the upper edge of the tetragonal star-like space, for the meridional zone or outline, and for the surface midway between the two, affords a good illustration of true and false photo-micrography. Among the rock sections, *Pikrite*, *Pitchstone*, and *Olivingabbro*,

are good examples of the special work for low powers. So also are the great bulk of the sections of different stems of plants, and almost to an absurd extent are the *Sarcoptes*, *Hematompinus*, *Acarus*, *Pulex*, and *Cinec*. The yeast plant (*Saccharomyces cerevisie*) and the blood-corpuscles, together with the living desmids and diatoms, abundantly exhibit the facility with which a liquid substance and the contents of a liquid medium can be photographed without any preparation, where the stage is horizontal. As showing the degree of magnification to be obtained without a special power at the full extension of the bellows, the two photographs of *Spirogyra*, *vegetating and conjugating*, each magnified about 800 diameters, may be put forward. The *stomata of the lily* is another highly-magnified photograph. The germ of the disease consumption (*Bacillus tuberculosis*) when compared with the exquisitely defined biconcave tides of the blood-corpuscles of the white rat, an albino among his swarthier brethren, sufficiently shows the difference in the nature of various kinds of work. To expect to make an equally effective diagram of these two subjects is equivalent to expecting to make from a balloon, at the altitude of a thousand feet or so, equally strong photographs of the Libyan desert, and the *Roches Moutonnées*. Finally, in the starch-grain of the potato, with its strongly marked striations and sharply defined hilum, and in the "all-over sharp" proboscis of the blow-fly, you have another example of legitimate and illegitimate photo-micrography, for in the former instance a scientific fact has been brought out, and emphasized by attempting to do justice approximately to one plane, whereas in the latter example the attempt to do equal justice to all the planes, to compress them, so to speak, and magnify them at the same time, has given the maximum of real confusion, the minimum of consequent fact, and exemplifies only mistaken effort, misguided zeal.

## Review.

PROCEDES DE REPRODUCTION DES DESSINS PAR LA LUMIERE. Par R. Colson. Crown octavo, 30 pages. (Paris, 1888: Gauthier-Villars, 55, Quai des Grandes Augustins.)

This deals with the reproduction of drawings by contact printing—a class of work largely practised in the case of engineers' and architects' sketches, as it gives working details as to the various ferro-prussiate methods; also particulars as to some of the less employed processes.

TRAITE PRATIQUE DE PHOTOTYPIC. Par Geymet. Nouvelle édition, crown octavo, 94 pages. Price 2f. 50. (Paris, 1888: Gauthier-Villars, 55, Quai des Augustins.)

This work is now so well known that we need merely refer to the new edition as well brought up to date.

TRAITE PRATIQUE D'IMPRESSION PHOTOGRAPHIQUE SUR PAPIER ALBUMINIE. Par G. Klary. Crown octavo, 132 pages. Price 3 francs 50. (Paris, 1888: Gauthier-Villars, 55 Quai des Grandes Augustins.)

One would expect a hand-book of silver printing by Klary to be a thoroughly satisfactory and reliable hand-book, and we take it that the photographer who expects this and obtains the work before us will not be disappointed. The chapter on "Failures" is especially complete and instructive.

PHOTO-LITHOGRAPHS BY THE PROCESS OF E. J. ASSER. Reproductions of Old Engravings (made by the firm W. A. Kroon and Sons, Amsterdam).

ALTHOUGH the Asser method in photo-lithography was one of the first introduced, it is still worked, especially on such difficult work as the reproduction of old engravings; and we have just received evidence of its capabilities in this direction.

The reproductions sent are from fine engravings of the early part of the seventeenth century. The depth of the broad black, and the delicacy of the fine hair lines, both excite our admiration. There should be a wide field before



photo-lithography as a means of reproducing old plate work, if we may judge from the work before us.

TRAITE PRATIQUE DE PHOTO-LITHOGRAPHIE. Par Geymet. Troisième édition, crown octavo, 106 pages. Price 3 francs 50. (Paris, 1888: Gauthier-Villars, 55 Quai des Grandes Augustins.)

WE have here almost a new book, rather than a new edition, and in its present form it is as clear and complete a handbook of the subject as one could wish to have.

TRAITE PRATIQUE DE PHOTO-MINIATURE, PHOTO-PEINTURE, ET PHOTO-AQUARELLE. Par A. Simons. Crown octavo, 44 pages. Price 2 francs. (Paris, 1888: Gauthier-Villars, 55, Quai des Grandes Augustins.)

A handy and compact treatise on the colouring and after-manipulation of photographs.

TRAITE DE METEOROLOGIE A L'USAGE DES PHOTOGRAPHES. Par J. Vincent Elsdén, Traduit par Hector Colard. Royal octavo, 118 pages. (Paris 1888: Gauthier-Villars, Quai des Grand Augustins 55.)

COLARD has admirably translated the articles which appeared in the PHOTOGRAPHIC NEWS, and the volume before us is a decidedly attractive one, printing and paper bring excellent.

#### THEORETICAL CONSIDERATIONS IN EXPOSURES.

BY SIR DAVID L. SALOMONS, BART.\*

To estimate the correct exposure which should be given to a plate, in order to secure the best result, depends on a large number of data. The quality of the light, nature of subject, rapidity of plate, construction of the lens employed, together with other considerations, all enter as factors. It is here proposed to confine our attention to the lens and to deductions connected with it.

The usual expression to indicate the relation existing between aperture and equivalent focal length is  $\frac{f}{B}$ , where B is a number. Some call this the *intensity*, others the *ratio* of the lens. Neither are strictly correct, and it is proposed to call this relation the *function* of the lens, and write it thus  $f \frac{1}{B}$ , the  $f$  written with two strokes to avoid confusion, clearly the relative rapidity will be expressed by  $f \frac{1}{B^2}$ .

The following considerations will show why the change is suggested. If every lens permitted the same amount of light to pass, apertures and focal lengths being equal, the expression  $\frac{f}{B}$  in

common use would be correct, but this is not the case. Some lenses are composed of more glasses than others, and consequently reflect away more light as the number of the reflecting surfaces increase, and the absorption is also unequal, depending upon the number of lenses used in the combination, thickness and quality of the glass. Now if for every lens an *efficiency* value were found, call this  $e$ , then we have a true value from which the relative rapidity of any lens may be found, compared with any other lens or with a standard. We now get the rapidity of a

lens expressed as  $f \frac{1}{B^2} \times e = f \frac{e}{B^2}$ , and it would be best to keep to this form of expression, instead of reducing it to

$f \frac{1}{B^2} = f \frac{1}{B'}$  when  $B' =$  the new value. For marking the

stops  $f \frac{1}{B'}$  might be employed, but every lens should have

$f \frac{e}{B}$  engraved upon it, for the knowledge of the value of  $e$  may often prove of service, and in calculation  $e$  is not altered, whereas

\* A Communication to the Photographic Society of Great Britain.

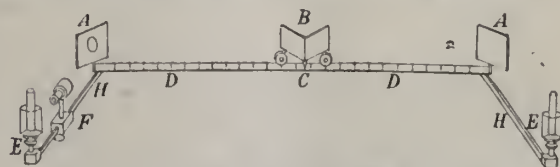
B varies as the square of its value. No doubt some makers of lenses would object to  $e$  being known, as it would tell many tales, but I do not believe our leading opticians would fear it. Many lenses now ranking low in the scale of rapidity would be raised higher up, and many very rapid ones would be taken down a peg; but be this as it may, let us know the truth, for better or for worse. There are many ways of finding the value of  $e$ ; the following method is perhaps the simplest and the most easily applied in practice.

Employ a Bunsen photometer, the ordinary form of which consists of a long scale upon which a carriage travels on wheels. At each end of the scale is placed a source of light, at one end a standard light, and at the other, the light to be tested. The carriage carries two screens, each receiving illumination from one of the sources of light. The observer sees the two lighted-up screens on the carriage side by side, and he moves this along the scale until both illuminations appear equal. A pointer on the travelling screen shows the distances from the two lights. Call these distances  $x$  and  $y$ , then the comparative illuminations are

as  $\frac{x^2}{y^2}$ , and since one source of light is a standard, the one under

test can be expressed in terms of the standard employed. To apply this photometer for the special purpose proposed, a slight modification is necessary. First, the standard light should be replaced by a screen illuminated by a parallel beam from a standard source of illumination, so that this lighted screen becomes the comparing standard. A similar arrangement is placed at the other end, and the lights so adjusted that the lit-up circles are equal in diameter as well as in brilliancy, so that the carriage pointer may stand at zero, and circles of equal brilliancy appear on its screens. We will call the screens at the ends of the scale the "comparing screens." Let there be an arrangement by which any lens may be placed between one standard light and its comparing screen, so that the optical axis of the lens may coincide with the axis of the parallel beam; this is not essential but convenient. It is evident that the circle of light will be reduced by the convergence of the rays after passing through the lens. If a concentric circle is drawn upon the screen having  $\frac{1}{10}$ th the diameter of that lighted by the parallel beam, and the lens in its carrier is travelled till only this small circle is illuminated, it is clear that the intensity of the light should be 100 times what it was before the lens was inserted. The carriage is now moved to balance the light from the two comparing screens, and any difference between 100 and the actual number read off is the loss of light due to the lens itself, and the difference between this loss and 100 expresses the efficiency or  $e$  of the lens tested. The scale should be divided to show  $e$  without further calculation; so all that would be necessary to do in practice would be to insert a lens in the carrier and move it till the small marked circle only is illuminated, then move the carriage to obtain a balance, and note the reading  $e$ . Each test would not occupy more than one minute by this method. A set of suitable diaphragms may be used, in order to reduce the size of the beams to the diameter of the lens under test, but it is not absolutely necessary, for equal brilliancies are not affected by the size of the lighted area.

Plan of proposed photometer to ascertain the value of  $e$ .



A A, comparing screens at 45° with scale; B, carriage of usual Bunsen photometer; C, pointer; D D, divided scale; H H, rods at right angles to scale; E E, standard Methven lamps, with lenses in front to render the beams parallel; F, sliding lens-holder and lens.

These tests give the value of  $e$  for solar focus. A modification of the test would give the value for any other focal length, say the widest angle the lens is made to include. The beam from the standard lamps in such case will no longer be made parallel, but converged as may be required. If similar lenses are used before each standard lamp no absorption error is introduced. The value of  $e$  for solar focus is practically all that is required, certainly for landscape lenses, which are usually worked near their principal focus; and in other cases it is near enough, because the value is only required for comparisons to enable the stops of all lenses to be marked to a true standard without regard to the



quality of glass or construction of the lenses. This end is much desired. We will consider the use of this proposition in practice.

Suppose two lenses are given, one  $f \cdot \frac{70}{5}$ , and another  $f \cdot \frac{80}{10}$ .

The common practice is to mark the stops  $f \cdot \frac{1}{25}$  and  $f \cdot \frac{1}{100}$

for rapidity comparison, and expressed by the decimal standard we have 2.5 and 10, that is, one lens is 4 times more rapid than the other. But if the value for  $e$  is taken into consideration for these lenses we obtain  $2.5 \times .70$  and  $10 \times .80$  respectively, equal to 1.75 and 8, which is the true relative value. Since  $e$  is constant for any lens, the present method of marking the stops might remain in force, and  $e$  being known for each lens, its value could at once be used when comparisons are necessary. Thus if  $m$  and  $n$  are values on two stops belonging to two lenses having respectively  $e$  and  $e'$  for efficiency values, then comparative rapidity is not  $\frac{m}{n}$  but  $\frac{em}{e'n}$ .

I hope a good case has been made out for the use of placing  $f \cdot \frac{e}{B}$  on every lens instead of  $f \cdot \frac{1}{B}$ , which, however, is rarely engraved on the lens itself as it ought to be. It is also hoped that the method for ascertaining the value of  $e$  in all cases has been shown to be easy and accurate as well as rapid in practice. The mean optical centre should also be indicated by a groove turned on the mount, the plane containing this circle passing through the axis of the lens at this point.

**Depth of Focus.**—Where this is great it has a bearing on exposure. Let us investigate depth of focus first. I would define this expression thus: the space between two planes outside the camera wherein all objects can be focussed on the screen, no point in the objects being reproduced by circles of confusion exceeding  $\frac{1}{100}$ th of an inch. This definition is clear, and one is required, for different persons have varying conceptions as to the meaning of depth of focus. Mr. Thomas Dallmeyer recently showed a geometric method to obtain the value in any case,

proving  $f + \frac{f^2 R (\Delta - f)}{f^2 R - \frac{\Delta}{100}}$  for the distance beyond the true

focussing plane from the lens, and  $f + \frac{f^2 R (\Delta - f)}{f^2 R + \frac{\Delta}{100}}$  for the

distance in front of the true focussing plane from the lens. When  $f$  = any focal length,  $R$  = ratio,  $\Delta$  = distance of object from the lens. Thus the depth of focus by the above definition becomes—

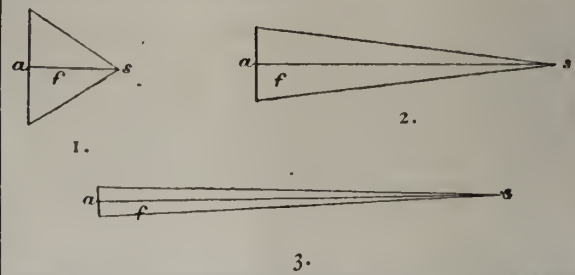
$$\left( f + \frac{f^2 R (\Delta - f)}{f^2 R - \frac{\Delta}{100}} \right) - \left( f + \frac{f^2 R (\Delta - f)}{f^2 R + \frac{\Delta}{100}} \right) \\ = \frac{2 \Delta 100 f^2 R (\Delta - f)}{(100 f^2 R)^2 - \Delta^2} \text{ or } \frac{2 (\Delta - f)}{\frac{100 f^2 R}{\Delta} - \frac{\Delta}{100 f^2 R}}$$

To obtain the infinite depth of focus, which is that distance beyond which all will be in focus equate  $(100 f^2 R)^2 - \Delta^2 = 0$  from which  $\Delta = 100 f^2 R$ , which means that all will be in focus beyond  $100 f^2 R$  inches from the lens. I might call this one infinite value; it is not absolutely accurate, for it should be  $f + 100 f^2 R$ . Mr. Dallmeyer proved this expression also in another problem, but it will be interesting to see later how the two values arise. The following is perhaps the simplest way to find depth of focus: Take the usual formulæ for conjugate

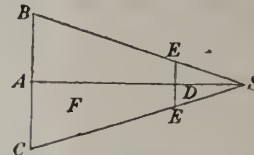
foci  $(n+1)f$  and  $\left(\frac{1}{n} + 1\right)f$ , where  $f$  = principal focus of lens, and  $n$  = number of times  $f$  between the principal focus and the longer conjugate, so that the latter is expressed by  $f + nf$ .

Now, if we do not enlarge the object  $\left(\frac{1}{n} + 1\right)f$  expresses camera extension. Depth of focus depends on the parallelism of the rays within the camera, and consequently is worse as the aperture is enlarged, and better as the focal length is increased.

This is evident from the following figures, where  $a$  = diameter of aperture, and  $f$  the focal length:—



These show that the screen at  $s$  may be moved in fig. 3 a good deal more than in figs. 2 and 1 without disturbing the sharpness of the image in a great degree. The depth of focus in any lens, therefore, varies as  $\frac{f}{a}$ , and if the movement of the screen is such that no point is represented by a circle of confusion greater than  $\frac{1}{100}$ th of an inch to secure the sharpness required in accordance with Dallmeyer's proposal, then  $\frac{f}{100a}$  is the allowable movement. This is shown by considering the following figure:—



Let  $BC = a$ , and let  $a, f$ , and  $s$  have the same meanings as before. Join  $BS, CS$ . Draw a line  $(EE')$  parallel to  $BC$ , so that its length shall be  $\frac{1}{100}$ th of an inch between the points where  $EE'$  intersects  $BS$  and  $CS$ . Let the distance where  $EE'$  cuts  $f$  measured from  $s = d$ . Then from similar triangles  $\frac{d}{f} = \frac{EE'}{a} \therefore d = f \cdot \frac{EE'}{a}$ , and  $EE' = \frac{1}{100} \therefore d = \frac{f}{100a}$  now  $\frac{a}{f} = R$  or ratio, so that  $a = fR$ ; consequently, by inserting  $fR$  for  $a$  in the equation  $d = \frac{f}{100a}$  we get  $d = \frac{f}{100fR} = \frac{1}{100R}$ . Apart

from any other consideration, the expression  $\frac{1}{100R}$  shows, in the simplest way, that the depth of focus varies in the inverse ratio of the value of  $R$ , which is usually engraved upon the stops.

To go back to the formulæ  $(n+1)f$  and  $\left(\frac{1}{n} + 1\right)f$ . The smaller conjugate may be increased  $\frac{1}{100R}$  without blurring

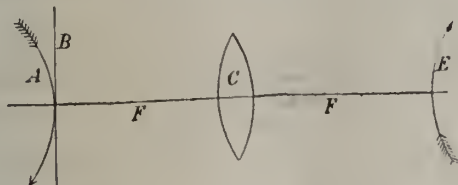
the image, and  $\left(\frac{1}{n} + 1\right)f$  becomes  $\left(\frac{1}{n} + 1\right)f + \frac{1}{100R}$ . Now find the new value for  $(n+1)f$ , and the result will be the limit of sharpness for objects nearer to the lens than true focal plane, and if the formula  $\left(\frac{1}{n} + 1\right)f - \frac{1}{100R}$  is taken, then the required distance beyond this plane is found. If the expressions are worked out, and  $\Delta$  substituted for  $(n+1)f$  we get  $f + \frac{f^2 R (\Delta - f)}{f^2 R + \frac{\Delta}{100}}$ , and by using the proper sign, the infinite

value becomes  $f + 100 f^2 R$ . The process by which this was derived is not correct for all conjugates—i.e., all values of  $f$  in any lens, because  $f$  indicates the principal focal value, and therefore only applies in the special case. By starting the operation afresh, using  $\frac{\delta}{100fR}$  for  $\frac{f}{100fR}$ , where  $\delta$  = smaller conjugate, and substituting a value for  $\delta$  to avoid its appearance in the final formulæ, the same result as that found by Mr. Dallmeyer is arrived at.

It is also clear that when infinite depth of focus exists, the image must be formed at a distance not exceeding  $f + \frac{1}{100R} = f + \left(\frac{1}{100fR} + 1\right)$  from the optical centre of the lens; consequently the other conjugate becomes  $f + 100 f^2 R$ .



the result required, which is the simplest method of proving this problem. If the stops are marked by decimal standard, this formulæ may be written  $f + \frac{100 f^2}{\sqrt{DS \times 10}}$ , where DS stands for decimal standard. It must be remembered that all formulæ relating to depth of focus only hold good provided that the lens has a flat field. If the field has much curvature, the depth of focus is worse, because those objects which are situated away from the centre of the picture are focussed nearer the lens than the focussing screen, and consequently, when a particular plane is in focus at the centre of the screen, objects nearer the lens are in focus at the edges. This may in some cases be an advantage, and if it is possible to construct a good lens with a negative curvature, so—



C represents the lens, FF the axis, E the object, A the negatively curved image, and B the plate.

then it would be easy to focus perfectly a head life-size without stopping down, and without requiring depth of focus. Such a lens would have to be constructed for a special negative curvature, and would be useless except for heads approximately life-size. Depth of focus itself is independent of the lens, but the difference in curved fields as compared with flat ones is, that the planes in space are in the first case curved, and in the latter plane; consequently "depth" is only of practical service in the case of flat fields, except in special cases, when the curvature in the object suits a curvature of the image. Probably the errors introduced in such a lens might prove of less consequence than the present troubles. Having ascertained these results from the formulæ most commonly in use, and known to almost every photographer, it now becomes necessary to show how depth of focus enters into the question of exposure.

(To be continued.)

## Patent Intelligence.

### Applications for Letters Patent.

- 7,788. THOMAS ROCHE, 323, High Holborn, Middlesex, for "Improvements in or relating to apparatus for containing, changing, and exposing sensitized photographic plates or films."—May 28th, 1888.
- 7,942. THOMAS KERR, 52, Grosvenor Park Road, Walthamstow, Essex, for "An improved photographic 'detective' camera and changing-box."—May 31st, 1888.
- 7,999. ARTHUR GEORGE MILES, 27, Dame Street, Islington, London, N., for "An improved pneumatic release for drop or other instantaneous shutters for photographic purposes."—May 31st, 1888.

### Specifications Published.

- 4,692. ALEXANDER HENRY REED, of Suffolk House, Laurence Pountney Hill, Cannon Street, in the County of Middlesex, Engineer, for "A new or improved photographic dark chamber."—Dated March 27th, 1888.
- A developing tent with arm holes and an inspection pane.
- 9,220. JAMES ARTHUR RICHARDS, 127, Long Street, Sparkbrook, Birmingham, Tool Maker, for "An improved adjustable stand for holding glasses to exhibit photos, cards of every description, and all articles of like nature."—Dated June 29th, 1887.

The Patentee says:—

I first of all form the backbone by cutting by tools out of sheet brass or other metals a strip the length and width required, or when more convenient the backbone may be made out of drawn metals; I then at a certain distance from one of the ends of strip of brass force out by tools a small collar to allow of one end of a close wound spiral spring to pass through, the end of strip farthest away from small collar is then turned up by tools in shape of a hook, this constitutes the backbone. I next proceed to form the bottom bar, which I cut out by tools to the desired shape; I then form two openings to allow the backbone

to pass through, and also pierce a small hole to allow of the other end of spiral spring to pass through; I next bend it into the required shape by tools, then pass the backbone through the two openings formed, fasten the backbone and bottom bar together by means of the spiral spring, and finish by turning up the free end of backbone to keep it from pulling out of bottom bar.

- 12,275. WILLIAM TYLAR, 31, Yates Street, Aston Road North, Birmingham, Dealer in Microscopic and Photographic Apparatus and Commission Agent, for "A folding developing tray with plate lifting frames in which all handling of photographic plates is entirely avoided."—Dated September 10th, 1887.

The Patentee says:—

My invention consists of sheets of a suitable pliable waterproof material, or combination of materials, as Willesden paper, celluloid, &c. &c., so scored or indented as to be readily folded into a tray, or trough, for the reception of fluids. This tray or trough is held firmly in position by corner clips of metal of suitable form. Inside each tray is a frame of waterproof material, vulcanite, metal, or other suitable substance. This frame has a central opening and projecting ends forming handles. In use the plates are laid on this frame while in the solutions, and they are readily lifted for examination by transmitted light or from one bath to another. To avoid mistakes in using the wrong tray for the wrong chemical, I legibly print names of chemicals and formula for mixing them on each bath. The lifting frames and printing can be applied to any tray in any material.

- 16,131. CARL HEINRICH HAMMAN, of Offenbach on Main, in the Empire of Germany, Manufacturer, for "Improved means for securing the leaves in photographic albums and the like."—Dated 23rd November, 1887.

The provisional specification is as follows:—

The present improvements in stands and albums for photographs enables each leaf to be connected or disconnected at will with the other leaves.

For this purpose the leaf is provided at one end with a wire, which projects on both sides and forms journals.

In constructing a stand in which the leaves are arranged, the foot and the back are rigidly connected with each other, the position of the back being somewhat inclined, so that the several leaves with the inserted photographs find a convenient abutment against the same.

The cover is hinged to the foot so that it can either be turned up, or it can be folded over the leaves or photographs, so that the latter, being covered by it, is between the same and the back.

By triangular parts made of thick sheet metal, a rigid connection between the back and the foot is established.

The left hand part is provided at its inner side with holes arranged at regular distances apart, whilst the right hand part has slits which correspond with the said holes and are also arranged at the same regular distances apart.

Upon the said right hand part, and connected therewith by means of pins and slots, is placed a slide which is provided with slits corresponding with those in the said right hand part.

By reason of this connection by slots and pins, the slide can be caused to move to and fro upon the right hand part, the slits of the two parts being directly one above the other at one time, forming as it were a single slit, whilst at another time the slits in the said right hand part are covered by the flaps of the slide and closed by them above.

If now the slide is placed in the position in which the slits of the right hand part are free, one journal can be passed through the corresponding slit of the slide into the slit of the right hand part that is below by first inserting the other journal of the leaf into the respective hole of the left hand part.

If, then, the slide is displaced whereby the slits are covered by the flaps of the slide, the journal of the leaf cannot be removed from the slit, therefore the leaf itself is now supported between the right and left hand parts, so that it can be turned upon its journals.

If, on the other hand, a leaf is to be taken out, the slide is displaced in the opposite direction, whereby the slits are set free again.

As now one side of the leaf with one journal is lifted from the slit, it can be drawn with the other journal from the hole of the left hand part, so that it is entirely separated from the other leaves of the stand.

In applying my improvements to albums I firmly secure upon the inner side of the album backing a wooden slat.

At the two front ends of the same are fixed discs that are provided with the holes arranged at regular distances apart,



The said discs are covered by other discs forming a cap, and secured upon them by means of screws, whereby the holes in the discs are closed sideways.

On one side the said screw is provided with a milled head forming a thumb nut, so that it can be easily screwed in and out by hand.

The album leaves are with the journals in the holes of the discs; they can therefore be easily turned over, but not displaced in a lateral direction, as the holes of the disc are closed to the outside by the cap.

If now one or more leaves are to be taken from the album, the screw and the cap on one side of the slat are removed, and now the journal of the respective leaf can be passed through the hole of the disc whereby the journal on the opposite side completely passes from its bearing.

If the leaf is now raised a little on this side, the other journal can also be removed from its bearings so that the said leaf can be completely removed from the album.

When inserting a leaf in the album the same operation is repeated in the reverse order.

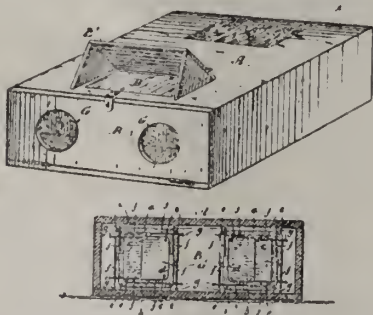
As a special advantage of this improvement is the great durability obtained by the insertion of the metallic rods, and also the easy and convenient means of changing the several leaves.

KENERELL'S SPECIFICATION, (No. 10,844). We are compelled to leave the full text of this over till next week.

#### Patents Granted in America.

380,136. EMIL H. RIEDEL, New York, N.Y., for "Photographic dark-chamber."—Filed Dec. 15, 1887. Serial No. 257,996. (No model.)

Claim.—1. The combination, with the box A, having a door B, panes C D of non-actinic coloured glass, and arm-holes G G,



of the elastically-supported flaps *a b c d*, substantially as described.

2. The box A, having a red-coloured glass pane C, an orange-coloured glass pane D, a screen E, protecting the orange-coloured pane, arm-holes G G, and elastically-supported flaps for closing said arm-holes, substantially as described.

380,639. JOSEPH STRACHAN, Brooklyn, N.Y., for "Photographic printing-frame."—Filed July 28th, 1887. Serial No. 245,496. (No model.)

Claim.—1. A print-frame provided with rollers adapted to hold the drawing and sensitized paper, and connecting devices to cause the drawing and sensitized papers to move with the rollers and with each other, and a suitable place between the rollers for exposing the drawing and sensitized paper to the light.

2. A print-frame consisting of a middle portion, where the drawing and the sensitized paper are exposed, and two end boxes and rollers mounted therein, one roller to hold the drawing and sensitized paper before exposure, the other roller to hold them after exposure, and connecting devices to cause the drawing and sensitized paper to move with the rollers and with each other, substantially as shown and described.

3. A print-frame consisting of a middle portion, where the drawing and the sensitized paper are exposed, and two end boxes and rollers mounted therein adapted to feed and receive the drawing and sensitized paper respectively, and adjustable friction-bands adapted to bear on said rollers, substantially as shown and described.

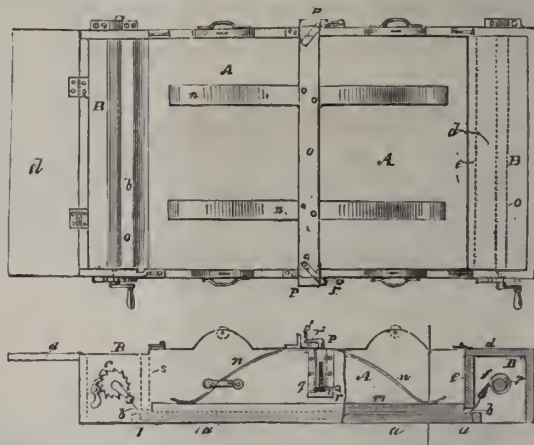
4. A print-frame consisting of a middle division with a glass and an adjustable back-piece, between which the drawing and

sensitized paper are held and exposed, and two end boxes having slits through which the drawing and sensitized paper pass to or from the middle division, and rollers in said boxes to hold the drawing and sensitized paper, and hinged and sliding sides to said end boxes, substantially as shown and described.

5. A print-frame consisting of a middle division, with a glass under which the drawing and sensitized paper are exposed, and two end boxes and rollers mounted therein to hold the drawing and paper, and connecting devices to cause the drawing and sensitized paper to move with the rollers and with each other, and a crank-arm and a ratchet and pawl attached to each roller for moving the drawing and paper and holding the same taut, substantially as shown and described.

6. A device for fastening the drawing and sensitized paper in a print-frame to end rollers, consisting of a connecting-piece of suitable material adapted to be fastened to the roller at one end, eyelets at the other end of said connecting-piece, gripping-pieces passing through said eyelets, and hands on said gripping-pieces for opening or closing the jaws of the gripping-pieces, substantially as shown and described.

7. A device for fastening the drawing and sensitized paper in a print-frame to end rollers, consisting of a connecting-piece of suitable material adapted to be fastened to the roller at one end, a strip of metal inclosed in the other end of said connecting-piece, eyelets through said metal strip and the material inclosing it, gripping-pieces passing through said eyelets, hands on said gripping-pieces for opening or closing them, pins projecting inwardly from the ends of the gripping-pieces, and holders having



holes to receive said pins and adapted to clamp the drawing and paper when the gripping-pieces are closed, substantially as shown and described.

8. A print-frame consisting of a middle division, where the drawing and sensitized paper are exposed, and two end boxes and rollers mounted therein to hold the drawing and paper, and two pieces of suitable material, each one adapted to be fastened to its roller at one end, eyelets at the other end of each piece, gripping-pieces passing through the eyelets, and bands on said gripping-pieces for opening and closing the jaws of the gripping-pieces, substantially as shown and described.

9. In combination with a print-frame having a middle division, with a glass under which the drawing and sensitized papers are exposed, and two end boxes and rollers mounted therein to hold the drawing and paper, and strips of opaque material at the ends of the glass to mark the section-lines, substantially as shown and described.

10. A device for fastening in its place the back piece of a print-frame, consisting of a cross-piece, springs attached thereto and adapted to bear on the back of the print-frame, and bolts having a sliding connection with the print-frame, and projecting arms on said bolts, one adapted to bear on said cross-piece, and the other to bear against some part of the print-frame, substantially as shown and described.

11. A print-frame consisting of a middle division, with a glass under which the drawing and the sensitized paper are exposed, and end boxes and rollers mounted therein to hold the drawing and paper, in combination with a back piece, a cross-piece, springs attached to said cross-piece and adapted to bear on the back piece, bolts having a sliding connection with the print-



frame, and projecting arms on said bolts, one adapted to bear on said cross-piece and the other to be turned under some part of the print-frame, whereby the pressure of the back piece upon the drawing and paper can be removed when a new section of drawing is to be passed under the glass, all substantially as shown and described.

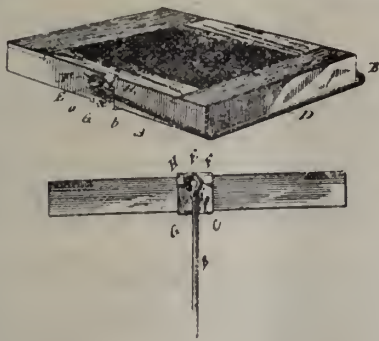
381,091. HENRY SUTTON, Ballarat, Victoria, for "Process of converting a photographic image on a gelatine surface into a relief or intaglio."—Filed Nov. 9, 1887. Serial No. 254,693. (No specimens.)

*Claim.*—The herein-described method of converting a photographic image on a gelatine surface into a relief or intaglio printing-surface, which consists in immersing the plate bearing the photographic image in water of a temperature below that of the melting point of the unexposed parts of the gelatine, in order to swell the same by absorption, then taking out the plate and removing the free water from the surface thereof, then exposing the plate to a degree of heat at which the unexposed parts of the gelatine will begin to melt until the water-absorbed gelatine has been dissolved, substantially as described.

381,315. LEO F. ADT, Waterbury Conn., for "Photographic printing frame."—Filed Dec. 3rd, 1887. Serial No 256,931. (No model.)

*Claim.*—1. In combination with a photographic printing-frame a prop consisting of two legs pivoted to the respective sides of the frame, and so as to swing into or out of the plane of the frame, with a stop on the frame in a position to support the prop in its closed position, and a second stop in the frame arranged to support the prop in its open position, substantially as described.

2. As an article of manufacture, the herein-described prop for



photographic printing-frames, consisting of a pair of pivot-plates *a*, adapted to be secured to the respective sides of the frame, and constructed with a projecting pivot *E*, and with the stops *F* *G*, combined with the prop, consisting of the legs *A* *B* and the connection *D*, the two ends of the legs terminating in eyes corresponding to the pivots on the plates, substantially as described.

3. The herein-described prop for photographic printing-frames, consisting of a pair of pivot-plates *a*, adapted to be secured to the respective sides of the frame, and constructed with stops *F* *G*, combined with legs *A* *B*, pivoted by one end to said plates, substantially as described.

## Correspondence.

### THEORETICAL CONSIDERATIONS IN EXPOSURES.

SIR,—Mr. T. Dallmeyer appears to have read my calculations in a wrong light. In the paper read before the Photographic Society of Great Britain on May 8th, I gave two calculations for depth of focus, one using camera extension equal to focal length plus  $\frac{1}{100 R}$ , and the other

with the addition of  $\frac{\delta}{100 f R}$ , when  $\delta$  = camera extension.

My object in giving the first calculation was to show a method of finding a true value for infinite depth of focus. Mr. Dallmeyer appears to have mixed the two calcula-

tions together. In the first,  $\Delta$  has an infinite value for  $f$  = exact equivalent focus, and in the second for equal size  $\Delta = 2f$ .—Yours faithfully,

DAVID SALOMONS.

Broomhill, Tunbridge Wells, June 4th, 1888.

### DALLMEYER'S RECTILINEAR LANDSCAPE LENS.

SIR,—As the subject of Mr. W. K. Burton's letter will probably prove of interest to many of your readers, I purpose mentioning all the optical points which will affect brilliancy in the image.

1st. The colour and thickness of the optical glass employed. This subject is under the notice of both professional and amateur, and we may hope soon to have some ready device for so-called "efficiency value." I am of opinion that some very interesting results will be obtained due to the colour of the glass employed and its thickness.

2nd. Equality of illumination greatly affects brilliancy; the rapid falling-off in illumination towards the edges of a plate greatly detracting from it. In single combinations, with the diaphragm placed in front of the combination, there is usually nearly a full pencil to the edge of the plate for which the lens is intended. This may also be the case with double combinations in close proximity, such as in wide angle rectilinear lenses and aplanatic lenses when used with smaller stops, though to a less extent.

3rd. The quality of the marginal definition is of extreme importance, and if by any particular optical construction the optician can better that, it will greatly enhance the value of the picture as regards brilliancy. The perfection of the marginal definition in the rectilinear landscape which I recently introduced has been proved practically by its performance in copying maps and plans, and in architecture, where it is most essential to have perfect marginal definition, consistent with flatness of field and rectilinearity.

4th. The brilliancy of the image, again, depends to a great extent upon the ratio of aperture to focus, and in a landscape lens, it has been the aim of opticians to furnish single combinations that will work with the greatest possible intensity, consistent with covering power; very small apertures invariably detracting from brilliancy. This is easily explained from the fact that the brilliancy of reflected images in any combination is not reduced by stopping down. This is very important, for it is evident that if the brilliancy of the reflected images be an important element in detracting from the final brilliancy of the image produced by the lens, the detrimental effect will be more and more apparent as the lens is stopped down.

5th, and lastly. With reference to the main point that Mr. Burton has asked me to elucidate in this matter. The best explanation I can offer is one which any photographer can verify for himself. Place a bright object, such as a lamp, at a distance of from fifteen to twenty times the focal length of the lens.

(a) Take a single cemented combination, such as a triple meniscus; focus for the lamp, and then remove the screen, place the eye near the screen, and centrally with the lens and the lamp. One bright reflected image only will be visible to the naked eye along the axis.

(b) Take the rectilinear landscape lens referred to, and treat it in the same manner. Two bright reflected images, and three faint ghost-like reflected images, will be visible on looking along the axis.

(c) Take a double combination, such as a rapid rectilinear, or wide angle rectilinear, with a diaphragm between the lenses (or no diaphragm at all), and you will find five distinct bright reflected images.

It is needless to say that the positions of these images referred to will depend on the form of the optical construction. With regard to the case *b*, although the three faint reflected images referred to are closer together than in case *c*, due to the great proximity or contact of the thin posterior crown in the rectilinear landscape combination, it will be



evident that the extra brilliancy claimed for it, and corroborated by you, Sir, must be distinctly proved if there be lack of brilliancy in the resulting image produced by the number and brightness of the reflected images. In the fifth paragraph I have given a practical test that anyone can apply for himself without reference to the theoretical number of reflected images given by various combinations, &c.—Yours faithfully,  
THOS. R. DALLMEYER.  
25, Newman Street, W.

## Proceedings of Societies.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.  
The usual weekly meeting was held on the 31st ult., A. L. HENDERSON in the chair.

L. WARNERKE gave some interesting details of the progress of photography in Russia. Ten years ago there existed no photographic society in St. Petersburg of any kind. The wet collodion process was then in full swing. On one occasion, at a meeting of the St. Petersburg Technical Society, established on similar lines to the Society of Arts in London, he was invited to speak on the subject of photography. Considerable interest being evinced by many of the members present, it was ultimately arranged that a dinner should be given, when further proceedings could be discussed. It must be remembered that considerable difficulties exist in Russia in forming a Society of any kind. The president of the St. Petersburg Technical Society, a gentleman of high influence, however, being present at the dinner, took the matter up, and proposed, upon permission being granted, that a photographic section should be formed, and attached to the Technical Society. Permission being ultimately obtained, the first photographic society in Russia was formed. It now publishes its proceedings, and also a year-book similar to those published by the photographic journals in this country. L. Warnerke, continuing, said, during last winter he thought the time had arrived for starting a photographic exhibition in connection with the Society, the photographic section being better attended than any other section of the Technical Society; so much so, that great difficulty was experienced in finding room for members attending the meetings. At one of the meetings of the Society in November last he made a proposal to arrange an exhibition of apparatus and pictures, and that it should take place in a month's time from that date. This was not considered possible by the majority present, and the matter consequently was not taken up very warmly. Determined not to let the matter drop, his first endeavour was to get the patronage of the Grand Duke, which, being obtained, a small committee was formed to arrange preliminaries. A suite of rooms was selected in a good locality, and although the terms were very high indeed, the rooms were secured. Circulars were printed, and sent to every one likely to help the movement, followed by a personal visit soliciting exhibits, and by dint of sheer hard work L. Warnerke was able to fulfil his promise. In three weeks time the exhibition was in shape. Cards were now sent out to many eminent personages inviting them to the opening ceremony. The Emperor only attending public exhibitions when the public were excluded, it was not thought possible to get his attendance; a card of invitation, however, was sent to him. Subsequently the chief of the Russian Police was commanded to obtain a list of all the persons invited. This must have proved satisfactory, as not only the Emperor, but all his family, attended on the opening day. Unfortunately for the chief promoter, on the day of opening he was seized with a severe attack of gout in one of his feet, but nothing daunted, he attended the ceremony, wearing a large slipper on one foot, and a boot on the other, the Grand Duchess facetiously asking him if that was a new fashion. The Emperor took great interest in all the exhibits, the pictures especially engaging his attention. These were all critically examined by him. Awards were given in each department. With regard to the pictures, the public were made the judges. To each ticket of admission a coupon was attached, on which the holder was invited to state the number of the picture thought to be the best. The coupon was then torn off and deposited in a box. At the end of the exhibition the box was opened and the numbers counted, the picture obtaining the highest number of marks gaining the award; ten medals and ten certificates in all were awarded. The success of the exhibition

was so great that it was decided to continue it as long as the rooms could be rented. The exhibition was continued for thirty-one days. At the end of that time a dinner was given, and the financial statement presented. A profit having been made of 600 roubles, it was agreed this sum should be reserved towards the expenses of another photographic exhibition decided to be held the year following. From the register of attendance each day it was seen that the number of people attending on Sundays was much more in excess of other days.

L. Warnerke passed round a number of photographs both of the exterior and interior of the building where the exhibition was held. A novel financial chart was also shown by him, by which the principal items of expenditure was seen at a glance.

A hearty vote of thanks was unanimously accorded to L. Warnerke for his interesting description.

W. T. WILKINSON had been announced to give a demonstration of photography, but, owing to the lateness of the hour, it was agreed to postpone this until the following week.

## Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The last ordinary meeting for the session will be held on Tuesday next, June 12th, at 8 p.m., at the Gallery, 5A, Pall Mall East, when papers will be read, "Note on Depth of Focus," by Sir David L. Salomons, and "On Platinum Deposits," by Captain Abney.

PHOTOGRAPHIC CLUB.—The subject for discussion on June 13th will be "Photo-mechanical Printing." Saturday outing at Enfield; meet afterwards at "King James and Tinker."

## To Correspondents.

\*. Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER AND CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

R. BEATMAN.—The only way to ascertain will be to carefully search through the volumes previous to the time you mention, and we cannot undertake to do this for you. The volumes can be seen at the Patent Office Library, 25, Southampton Buildings, Chancery Lane.

J. CHAPMAN.—The addition of a little carbolic acid (phenol) will prevent the preparation undergoing decomposition. Ten drops to each ounce will be sufficient.

TEINBRIDGE.—Directions have frequently appeared in the PHOTOGRAPHIC NEWS, and in the YEAR-BOOK. See article on p. 786 of our volume for 1887.

W. LAWSON.—If you cannot obtain sufficiently vigorous reproductions on dry plates, try the wet collodion process.

W. BUSH.—Thank you for your note. Possibly we may have further information from you.

F. RUDDIMAN JOHNSTONE.—For large baths pins-wood fastened, together with hard wood dowels, and finally saturated with a bituminous varnish, answers well. The varnish sold by Hopkins and Williams, of Cross Street, Hatton Garden, under the name of "Liquid Jet," answers well, but a long time must be allowed for the solvents to evaporate. Large baths should be made to take the plate horizontally, and should have a well for the solution at one end. We are under the impression that baths for plates up to about 48 inches by 36 inches can be obtained from the Autotype Company, or from J. H. Burton, of Tyne Cottage, Hanwell.

ASSISTANT.—1. Mixtures of ivory black, bone brown, Vandyke brown, and madderlake will answer your purpose, but on no account use crimson lake, as it is so fugitive as to quickly discredit your work. 2. Rough ink eraser cut to pencil form can be used to remove or weaken parts of the drawing, but for clearing the image entirely off, we have found soaking in a mixture of nitric acid and sulphuric acid to be effective, but thorough soaking in water is necessary afterwards. Considering the present price of the opal glass, it is doubtful whether clearing off pays, unless many are to be treated at once.

PAUL RISDON.—1. We are inclined to think that you must have used too large an excess of silver nitrate, but if you test as directed, you should be able to clear up this point. 2. A little warmth is a convenience in working, but is not essential. 3. Use a thin glass flask, such as you can obtain from Griffin, of Garrick Street.

CORNELIUS.—If you want the best material, you must go to Winsor and Newton, or some dealer in artists' goods; but ordinary coarse calico, such as you can obtain from any draper, will serve very well in most cases.



# THE PHOTOGRAPHIC NEWS.

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### "ATMOSPHERE" IN LANDSCAPES.

THE season of the year which is now upon us, and which offers so much in field, hedgerow, and forest to delight the eye, causes the thoughts of those photographers who can indulge in the pleasures of out-door work, to dwell upon the prospect of new conquests to achieve, and to look forward to a fresh crop of results to send, perhaps, in the first place, to the autumnal exhibitions, and to look upon afterwards with satisfaction and pardonable pride. When determining if not to achieve success, at all events to deserve it, various good characteristics to strive for, and bad ones to avoid, occur to the earnest worker; and one of the points that crop up for his consideration is the beautiful effect of atmosphere that is sometimes obtained, and the corresponding failure that is too common, when atmospheric effect has degenerated into mere dinginess. How to accomplish the one result, and to avoid the other, is doubtless just now exercising many photographic minds.

The quality known as aerial perspective, or atmosphere, is one in which the work of the leading representatives of English art, in the domain of landscape painting, has long been recognised as excelling the productions of artists of other nationalities. The reason for the existence of this excellence in the works of our own countrymen is not difficult to discover, and consists in the fact that our climate, so much abused, and even almost denied to be entitled to the term climate, gives us a larger share than most of the other countries, where the art of painting is much practised, of that veiled condition of the atmosphere to which the names of fog, mist, or haze, according to the amount present, are applied.

The beauty of the effect of atmosphere, even in portrait work, was a few years since forced upon the attention of those photographers who employ scenic backgrounds, by the introduction of the work of an artist who made this branch of work his speciality, and who supplied painted backgrounds in which a middle distance was represented with great haziness and indistinctness, whilst a few foreground touches in strong relief gave the effect of atmosphere to the rest of the picture. That the superiority of this kind of work, as a foil to the portrait, was duly appreciated, was evidenced by the fact that although higher in price than most of that with which photographers had previously to be contented, it at once commanded a large sale, and met with the sincere flattery of extensive imitation.

In photography, the peculiar charm conferred upon a picture by a faithful rendering of the atmospheric effect so frequently met with in our own country has not been so commonly depicted as might have been anticipated. As an evidence of the comparative rarity of successful efforts in this direction, we call to mind the fact that a picture which

strikingly showed the capabilities of photography in this way, and which was exhibited a few seasons since, duly receiving the award of medal, appeared to many at the time almost as a revelation. Why should this be, and why should the satisfactory representation by photography of a common aspect of nature have been so unusual, whilst in English landscape painting it is almost universal? The reason will, we think, be found in a fact which it may not be agreeable to us, as photographers, to recognise, but which it behoves us to strive to remedy. Photography, we hold, will give us all the charm of aerial perspective when the photography is technically perfect, or nearly so, and the reason that that which should represent atmosphere is so commonly rendered merely as fogginess, is precisely because the photograph is wanting in the highest qualities of technical excellence.

The first great defect in most of those photographs in which the true aerial effect is lost, or has been replaced by mere fogginess or indistinctness, is that of want of true gradation, especially in the more exposed portions of the picture. This is a defect which, to some extent, is inherent in most photographic productions. The high lights come up to a certain density with a given exposure, but such a continuance of exposure as is necessary for the rest of the picture does not result in a corresponding increase of density in the highest lights themselves; so that in the result the range of tones in the lights is not at all distinct, and the variety that should exist, and that in nature and good painting does exist in the lights, is lost. The detail and form which this variety would give is effaced, and replaced by a nearly uniform flat whitish surface. Variations in the sensitive chemicals and developing agents employed will, however, produce corresponding variations in the ability of photography to truly render the gradations in the lights in the picture; and it is by careful observation and study of the effect of different chemicals, and methods of using those chemicals, that we can arrive at an intelligent understanding of the conditions under which the most truthful rendering of range of tone can be obtained; and so settle upon the means to be employed in order that such rendering may be a work of some certainty, and not a mere chance to be only occasionally secured.

The want of technical excellence which shows itself in a good deal of landscape work by the distance appearing all of one light foggy tone, with very little of the detail which the eye perceives, may be due not only to the chemical conditions, but also to other conditions which require careful attention if the best work is sought for. One very fruitful source of flatness of this character is a little fogginess of the plate which may arise from some light obtaining access to it in the process of manipulation, or not uncommonly from light reflected from the inner surface of the camera or lens tube, when the instrument has not been kept shaded as much as possible from all light but that



which goes to form the picture. A little dust or mistiness on the glass of the objective itself will also conduce to the same result. Spots of dust, too, and stains or blemishes of any kind, which in the more strongly-marked portions of the picture might pass almost unnoticed, will amongst the delicate and faint detail of the distance as obscured by atmosphere, show up in their native ugliness with fatal effect. In fact throughout, to achieve the best result, the greatest care must be taken, and no amount of artistic ability will stand in place of good photography, while it is only from the combination of the two characteristics that work of the highest class can be hoped for.

### ANNUAL REPORT OF THE ASTRONOMER-ROYAL.

THE report for the year ending May 10, 1888, has been issued, and the following items are of interest to the photographic world.

The building operations for extension of the Computing Rooms and erection of a dome 18 feet in diameter, were commenced on November 7 and completed by April 21, with the exception of the new dome made by Sir Howard Grubb, which is now nearly finished. The assistants and computers of the astronomical branch were, in the meantime, transferred to the Octagon Room, where temporary arrangements had been made for carrying on the office work. New desks and shelves for books have been fitted up in the Computing Rooms, and sinks for photography have been fixed in the Dome Room, the north portion of which is to be partitioned off as a photographic dark room. A fire-place, with provision for ventilation, has also been fixed in the Astronomer-Royal's Official Room. The increased space available in the new rooms, and the ready means of communication between the upper and lower rooms, are felt as a great convenience, and as the spectroscopic and photographic branch has been transferred to the Upper Computing Room, the whole of the astronomical establishment is now brought together. It is intended to mount the Cooke 6-inch equatorial, with the photoheliograph tube attached, on the new pier as soon as the 18 foot dome is completed.

*Equatorials.*—The Lassell equatorial is in good order. The photographic camera was dismounted at the beginning of this year, and the small plane mirror inserted for eye observation. The driving clock has required some small repairs. The dome, 30 ft. in diameter, is in excellent order, and it has been found that it can be turned completely round (through  $360^\circ$ ) in 30 seconds by one person.

No progress has been made since the date of the last report in the construction of the new 28-inch refractor, owing to difficulty in obtaining the crown disk. The flint disk made by Messrs. Chance seems to be satisfactory, but up to the present neither that firm nor M. Feil's successor has succeeded in making a crown disk.

The South-east, Sheepshanks, Cooke, and Shuckburgh equatorials are in good order.

The Sheepshanks equatorial was completely dismounted and thoroughly cleaned last June, the object glass was re-centred, and the slow motions were repaired and improved for adaptation of the instrument to stellar photography under Mr. Criswick's supervision. A 4-inch photographic object-glass by Dallmeyer, belonging to one of the photoheliographs, was mounted at the end of June in a light wooden tube, and firmly attached to the side of the telescope tube and parallel to it, to carry out experiments on the extent of field available on plane and curved plates respectively, the latter being moulded by Messrs. Chance to a radius of 22 inches, corresponding to the curvature of the field, if the circle of least confusion be taken for the image. Forty-one photographs have been taken of the Pleiades and other objects with different exposures and in different parts of the plate, 13 of these being on curved plates. In these experiments the Sheepshanks refractor was used as

directing telescope, the image of a star being kept on its cross-wires during the exposure of a plate by means of the slow motions. The plates measure 6 in. by 6 in., representing  $5\frac{1}{4}^\circ$  by  $5\frac{3}{4}^\circ$ , and it is found that on the flat plates the star images are sensibly circular to a distance of nearly  $2^\circ$  from the centre of the field, while micrometric measures of these plates show that for some distance beyond this limit the relative places of stars can still be measured with an accuracy exceeding that of meridian observations, and with no sensible systematic error depending on magnitude or duration of exposures. Comparison of the results on flat and curved plates respectively indicates that the advantages of using the latter are doubtful. As the Dallmeyer object glass is peculiar in having the flint outside, it was reversed in the cell in the course of the experiments, and some photographs were taken with it in this position, the flint being inside. It appeared on comparing the results that a somewhat better field is obtained with the flint outside. A photographic object glass of six inches aperture and six feet focal length, made by Sir H. Grubb for experiment, was mounted at the end of April in place of the four-inch object glass, and some trial photographs of stars have been taken with it.

The spectroscopic observations of motions of stars in the line of sight have been continued during the past year, 273 measures of the displacement of the F line in the spectra of forty stars and sixty of the *b* line in sixteen stars having been made since the last report, besides comparisons with the spectra of the Moon, Mars, or the sky, as a check on the general accuracy of the results.

The photographic reductions for 1887 are completed, and the copy for press is prepared.

The Greenwich photographs have been measured in duplicate as far as 1888, February 5th, and the measures have been completely reduced so as to exhibit heliographic longitudes and latitudes and areas of spots and faculae.

The photographs from India and Mauritius have been received from the Solar Physic Committee as far as February 29th and January 9th respectively. The Indian photographs have been measured as far as 1888, January 13th, and completely reduced to the end of 1887. The Mauritius photographs have all been measured and completely reduced.

In view of the diminution of the current work as the minimum of Sun spots approaches, the further discussion of the results of former years has been commenced, and arrangements have been made through the Solar Physics Committee to complete the Greenwich results as far as practicable by the measurement of photographs taken elsewhere, particularly at Ely and Cambridge, U.S. From the beginning of 1882 the photographic record is practically complete, the measurement of Indian photographs to fill up gaps in the Greenwich series having been undertaken from 1881, December 22. The further discussion of results has, therefore, been commenced from that date, and the projected areas of spots (uncorrected for foreshortening) have been formed to 1883, May 29th, and from the beginning of 1886 to the end of 1887. The ledgers in which the areas, and positions of the spots of a group are collected, and the mean area and position of the group, deduced for each day and for the whole period of visibility, have been formed for 1886 and 1887, and their completion for the years 1882 to 1885 will now be taken in hand. Two new forms have been prepared to exhibit the distribution of spotted area on each day for every degree of latitude and for every  $10^\circ$  of longitude, mean results being taken for each rotation and for each year.

The only important change in the magnetic instruments is the substitution, since October last, of a wooden bar loaded with lead, of the same size and weight as the declination-magnet, for the brass bar hitherto used for determination of the torsion of the suspending skein, a very weak trace of magnetism having been detected in the brass bar.



The continuous register by photography of the changes in magnetic declination, horizontal force and vertical force, has been maintained, the absolute values of the magnetic elements being determined from time to time by eye-observation of declination, dip and deflexion, to give the means of obtaining the values for the reference lines from which ordinates on the photographic sheets are measured for each hour.

In my last report it was suggested that the instrumental equipment of the Observatory should be supplemented by a photographic refractor of thirteen inches aperture, (equatorially mounted) to enable Greenwich, as the National Observatory, to take its share in the scheme for forming a photographic map of the heavens, and for thus extending our knowledge of the places of the fixed stars. Consequent on the resolution of the Board of Visitors at the last Visitation, I brought this question of the insufficiency of our instruments for the present wants of Astronomy to the notice of the Admiralty and of the Chancellor of the Exchequer, and the matter is still under the consideration of the Government. If the Royal Observatory is to take part in this work of carrying out one of the principal objects for which the Astronomer-Royal was appointed, it appears to be essential that a decision should be arrived at without delay, in view of the circumstance that thirteen observatories (including those of Melbourne and Sydney in our own colonies) have already ordered their instruments, which are to be completed by the end of the present year.

Allusion was made in the last report to the increased demands made on the Observatory in recent years, both by the scientific and the general public, and in view of the consequent development of work, it now becomes necessary to review the position of the establishment, which was constituted many years ago, when the conditions were very different. In order to understand the difficulty of the present situation, it is necessary to bear in mind the following facts:—In 1835 there were five Assistants (excluding the Chief Assistant), having no computers to superintend, no extraneous work beyond the care of a relatively small number of chronometers for the Navy, no magnetic and meteorological observations, no altazimuth observations, no spectroscopic and photographic observations. At the present time there are eight Assistants (excluding the Chief Assistant), having fifteen computers to superintend, and of this staff two Assistants are absorbed by the Magnetic and Meteorological Branch, one by the Altazimuth, and two by the Spectroscopic and Photographic Branch, leaving only three assistants to do the Astronomical work, which in 1835 required five assistants, and in addition to perform all the extraneous duties which the Astronomer-Royal has felt it desirable to undertake in the public interest.

## THE CLERGYMAN AND THE PHOTOGRAPHER.

### EXTRAORDINARY PLEA.

THAT he never received any goods whatever, was the defence of a clergyman who employed a photographer to do work for him; but service worthy to be paid for does not always consist in handing over material articles, as no person should better know than a clergyman. The following is a formal report of a rather instructive case. *Friedman v. Palmer*, which was tried at Bow County Court on Friday, the 8th inst., before His Honour Judge Prentice.

The plaintiff is a photographer carrying on business at 126, The Grove, Stratford; the defendant is a clergyman, living at "The Chalet," Grove Hill, Woodford; the claim being for 10s. 6d., for work done.

Plaintiff stated that last summer the defendant asked him to make an appointment about taking his photograph. He did so, and he came to his shop. He said he should want two or three hundred to sell at the bazaar which was to be held for the benefit of his church (Holy Trinity, Hermon Hill). An arrangement was made for 5s. 6d. dozen, for vignettes; they were to be

sold at 1s. each. He took four negatives, and then the defendant desired to have a copy of the negatives, saying at the same time that he (plaintiff) would have a good deal of trouble with him, as he was a very bad subject. After taking the negatives defendant asked if he should have proofs, and he said he would send them. He sent them, and received a letter from the defendant saying the proofs were not good, and that he refused to give an order. After that he made a charge of 10s. 6d. for the work he had done with respect to the negatives, and the trouble he had taken.

Defendant: I never received any goods whatever.

His Honour: Had you not better give him something?

Defendant: I think I am entitled to some goods.

Plaintiff: Here is a letter saying he refuses to take any goods.

Defendant: I am quite willing to take a dozen or so.

His Honour read a letter from defendant, in which he said he supposed he (plaintiff) had destroyed the negative, and he didn't mind sending him a couple of shillings.

Plaintiff: He didn't do so.

His Honour: You had better settle it; make any arrangement you like.

Plaintiff: I will not do any photographs until I have the money in advance.

Miss Friedman said she told the defendant that the charge for vignettes would be 5s. 6d. a dozen.

His Honour: Judgment for the plaintiff for 8s. 6d. and costs, including the costs of one witness for two days, payable in a week.

## NOTES ON THE ROYAL ACADEMY.

### (SECOND ARTICLE.)

#### BY WIDE ANGLE.

INTENDING visitors may take courage. This year they can safely confine their attention to the "line," for with very few exceptions the pictures which are "floored" and those which are "skied" have been assigned their proper position. Of those pictures in Room I, by men outside the privileged Forty we may pick out "A Dress Rehearsal" (45), of A. Chevallier Taylor, as one that may be recommended to the attention of photographers. As a rule, the photograph which pretends to tell a story, and to which a fancy title is generally given, is very lavish in the display of "properties." This is also the characteristic of "A Dress Rehearsal." A young lady in a white dress is posing before an admiring old woman, while half-a-dozen girls are laughingly looking on. There is a property bonnet-box on the ground, another on the table; property cups and saucers abound; a property paraffin lamp hangs on the wall, and a property tea urn is on the table. The picture is one of those distressing puzzles of which there is always a goodly proportion in the Academy. What the "dress rehearsal" may be for, no one can tell. In this want of intelligibility, the picture also resembles the fancy photograph. Of quite another order is Robert H. Blum's "Venetian Lace Workers" (49). The merry-faced girls are charmingly grouped, they are utterly unconscious, and the painter has cleverly concealed all effort. It is one of the most successful of naturalistic pictures in the gallery. Tom Lloyd is not seen at his best in "Spring, Joyous Spring" (52). This painter excels in his representation of comely country lasses, but here he has provokingly painted a landscape without any figures at all. R. W. A. Rouse apparently sees nature always in a turgid aspect. He has two pictures, one entitled "Dreary November" (55), and the other "The Coming Storm" (80). We are bound to say that the titles might be changed from one picture to the other, and be equally appropriate. William Greaves' "Melting Snow" (71) is a cleverly painted picture, showing truthful observation; and F. D. Millet's "Love Letter" (81) will excite admiration for the consummate technique displayed. As a lady enthusiastically remarked in our hearing, "Look at the paper frill round the ham! Isn't it perfect?" It undoubtedly is, but it seems a pity, when the principal figure is a pretty girl, that one's attention should be engrossed by a paper frill and a ham-bone.



Truth to tell, Mr. Millet's "Love Letter" is one of the puzzles to which we have already alluded. Exquisitely painted, down to the smallest detail, it is, as regards any story it tells, lacking in interest and meaning. We may suppose that the girl has received a love letter unknown to the old gentleman who is seated with the *Times* before him at the well-spread breakfast table, but whether she is pleased or the reverse, her expression fails to convey. Henry S. Tuke has made sailors his study, and in "Land in Sight" (82) shows a boy running with the intelligence to two middle-aged salts who, in the cabin, have been beguiling the time with a game at cards. It is a meritorious piece of work, but not remarkable.

In Room II., H. P. Hain-Friswell's "The Winter Sunshine" (93) deserves notice. Mr. Hain-Friswell is one of the most conscientious of our young artists, and it is pleasing to see signs of growing strength. "The Winter Sunshine" is a great advance upon his picture of last year. The chalky "Siren" (95) of W. E. Armitage, R.A., may be passed over. The lady is not the siren pictured in most persons' minds; but perhaps the ancients' ideas of fascinating beauty were peculiar. John White's "Making a clean sweep of him" (96) is a cleverly-painted piece of humour, the figure of the girl with the pail being especially good. Had Mr. H. W. B. Davis not been painting brown moorlands all his life, his "Approach to the Bealoch-na-ba, Applecross" (114), would have extorted admiration. It is, of course, magnificently painted; the fault is, that one has seen so many pictures like it before. A. Moore, in "A River Side" (139), gives us the same golden-headed girls he has painted scores of times; very lovely, but scarcely rising above decorative art. E. Armitage's "Juno" (152) gives one a shock. The lady, who is neither majestic nor beautiful, is supposed to be floating through space, and Mr. Armitage has arrested her progress by pasting her on his canvas—at least, that is the impression the picture conveys. Lionel C. Henley's "The Laird and the Lady" (161) is another vexatious riddle. It is excellently painted; the lady has a charming face; the old gentleman she has called upon, the usual hard, stagey, landlord-looking visage; but what idea is one to gather? Is it a case of threatened eviction, or is there a love story somewhere?

Peter Graham's "A Norfolk River" (183), in Room III., is calm and reposeful, and will be looked at with interest by photographers, because of the comparison it suggests with P. H. Emerson's photographs of Norfolk scenery. Henry Wood's "Saluting the Cardinal" (213) is one of those charmingly natural bits of Continental life which this painter always renders so perfectly. "A Lost Cause; Flight of King James II. after the battle of the Boyne" (273), has all the melancholy tone in which Mr. A. C. Gow delights, but is far inferior to his pathetic picture of last year, "With the Honours of the War." No one can get up much interest in King James II., whether before or after the battle of the Boyne. H. W. B. Davis revels in another brown moorland picture with stags in "The Way to the Sanctuary" (280). A. Orchardson's "Her Mother's Voice" (286), which we noticed in a previous article, strikes us, on a second inspection, as almost absurd; you have to make believe a good deal to see anything pathetic about it.

P. R. Morris's portrait of "Mrs. Lorin A. Lathrop" (328), in Room IV., is unconsciously humorous. The lady has evidently seen a ghost, and is starting back in horror. Mr. W. B. Richmond's portrait of "Mrs. J. A. Fuller Maitland" (345) is the portrait of a neck—neck *et preterea nihil*. It invites one to imagine how a photographer would deal with so unaccommodating a sitter. W. H. Bartlett's "The Sea Diver" (346) is a thoroughly good picture. The absence of straining after effect is very marked, while its technical qualities are of a high order. Perhaps, if one were inclined to be hypercritical, it might be said that the back of the man who has stripped and gone in the water to assist in capturing the seal looks, under the circumstances, far too dry. Frank Bramley's ten-lency towards the melancholy is shown in his "Hope-

less Dawn" (357). It is very sad, and thoroughly realistic. Two women, worn out with watching for the fisherman who may never return, have fallen asleep, and the dawn is just stealing into the room. The candle burns with a sickly light, and through the little window can be caught a glimpse of the surging sea. To a different school belongs Robert Little's "Missal Painters" (380). It is one of those quietly painted pictures, with a dash of humour in it, on which the eyes love to rest. The face of the young monk, who is leaning back in his chair to admire his work, is delightful. C. E. Perugini's "A Summer Shower" (393) is noticeable for the cream-like complexions of the three young ladies who have taken refuge under a tree. The absence of a healthy natural colour is apparently due to a milk diet.

Ellen Montalba's picture of a Dutch girl (407), Room V., is very cleverly done; but what enormous arms! Grenville Manton seems to go out of his way to make the faces of the wife of Jeroboam (409) and the blind prophet unnecessarily ugly. George W. Joy's notion of water in "The Danaids" (438) is, to say the least, peculiar. His Danaid is presumably standing in water, but the effect is as though she had put on a pair of thin web socks.

"Saved from the Sea" (493), Albert Starling, might be purchased by the Royal Humane Society; we can scarcely imagine anyone hanging it up in a drawing room. W. Dendy Sadler's "In the Camp of the Amalekites" (507) is a capital piece of work, although we fancy the captive Roundhead trooper looks a little too jolly under the circumstances. Anyway, his expression speaks volumes for the good humour of the Cavalier captors. A. Harrison's "A Rainy Street" (525) is a careful rendering of nature, a comment which applies equally to W. Mouat Loudan's "Fish Sale, Polperro" (537). Herbert Schmalz has made a mistake in attempting the heroic. Painting pretty sentimental young ladies is more his forte. His representation of "Christian Martyrs" (542) in the arena is stagey. It does not touch the feelings in the least.

In Room VII., noticeable pictures are E. Blair Leighton's "To Arms" (573), S. Melton Fisher's "Venetian Costume Makers" (583), and "Les Misérables" (630). The latter, if not one of J. C. Dollman's happiest, is not the least original of his efforts. Seymour Lucas' "St. Paul's, The King's Visit to Wren" (643), is in the book-illustration school of Mr. W. P. O. Frith, and no one will care to linger before it. "A Moorish Story Teller" (654), Gabriel Nicolet, is a picture which not only shows much careful observation, but considerable technical skill. It is deserving of study.

W. D. Sadler, in "Old and Crusted" (669), Room VIII., has made the most of slender and slightly exhausted materials. Have we not had sufficient gentlemen of the Regency period eating and drinking, or about to eat and drink? C. W. Wyllie's "The Last of the Ebb" (670) has considerable poetic feeling. There is much beauty in mud, but it must be mud as Mr. Wyllie has rendered it, illumined by the setting sun. Yeend King still gives us the bright fresh green of the early summer in which he delights. His "Citizen's Sabbath" (709) is a charming little picture. Mr. Solomon J. Solomon shows signs of vaulting ambition o'erleaping itself. His "Niobe" (712) is a monstrous—we mean as to size—piece of work, and far from pleasing. Mr. Solomon's superabundant energy would be improved by a little restraint.

All that can be said of Caton Woodville's "Marriage of H. R. H. the Princess Beatrice" (999) is, that it is neither better nor worse than other pictures of this kind painted by order. The persons look hopelessly bored, and the Queen's portrait is, as usual, unlike any other. Mr. Woodville has done much better work in "The Last March of General Sir Herbert Stewart" (1011). Eyre Crowe, in "Nelson leaving England for the last" (1055), has drawn a remarkable boat. It contains ten men, and yet draws no more than six inches of water. Why it does not topple over can only be explained on the supposition that Mr.



Crowe has imagined that the laws of nature were suspended for this especial occasion.

Those who like the "Kiss Mammy" school of painting will find a fine specimen in Joseph Clark's "A Small Tea Party" (1078), most conspicuously and obtrusively on the line. Ernest Normand's "Esther denouncing Haman to King Ahasuerus" (1080) is clever, but slightly theatrical. T. B. Kennington still adheres to ashen tones and sadness in "Widowed and Fatherless" (1126), and to note the fact seems to be all that is necessary. Joseph Farquharson, in "The Hour of Prayer," has rendered the vastness of a continental cathedral with remarkable skill.

In the Water-colour Room there is much good work; indeed, taking it all round, the standard is higher than that of the oils. It also contains one of the best portraits in the exhibition—a portrait of Miss Anna Belinska, painted by herself. The miniatures seem to us to be more inane than usual; there are, however, a few exceptions, notably a couple contributed by Miss Annie Howard.

## LAW FOR PHOTOGRAPHERS.

BY S. J. DEBENHAM, SOLICITOR.

### CHAPTER IV.

#### *Relations with Neighbours and the Public—Nuisances.*

IN an earlier chapter I observed that the tenant of premises, and not the landlord, is responsible for damages caused by nuisances on the premises, and instanced defective cellar-flaps, and an awkward wire-blind. Where, however, the landlord had erected privies in such a situation that the use of them created a nuisance, the landlord was held responsible, and wherever the very existence of the thing demised constitutes a nuisance, the landlord may be held responsible.

An occupier who uses premises demised to him so as to create a nuisance is responsible for the consequences.

A nuisance (*nocumentum*) is "anything that worketh hurt, inconvenience, or damage."

Nuisances are of two kinds, public and private. Public nuisances are those which affect the public, and are an annoyance to all the Queen's subjects. These may be the subject of prosecution or indictment.

The occupier of a house is liable for allowing the continuance on his premises of any artificial work which causes a nuisance, even though it has been put there before he took possession. In a suit by the owner and occupier of a house against the occupier of an adjoining house complaining of noise from the defendant's stable, and of damp from artificial mound on which it stood, it was held that the plaintiffs were not only entitled to an injunction to prevent the defendant from keeping horses in his stable so as to be a nuisance, but that the defendant was also liable for not preventing the damp from going through the plaintiff's wall.

This, however, was not a public nuisance, and in regard to public nuisances it will be sufficient to say that they are the subject of various Acts of Parliament (the Nuisances Removal Acts), and the subject is hardly within the scope of this treatise.

It may happen that a man is made liable for a private nuisance which he is perfectly innocent of occasioning; and if the reader exclaims against the injustice of this, let him reflect that the injured person would with justice complain if he had no remedy for the damage caused by an accident to which he was no party. Perhaps the following is almost an extreme case:—

Defendant became the lessee and occupier of a house from the front of which a heavy lamp projected over the public foot pavement. As plaintiff was walking along, the lamp fell on and injured her. It appeared in evidence that three months previously defendant had employed an experienced gasfitter to put this lamp in repair. At the time of the accident a person employed by defendant was

blowing the water out of the gas-pipes of the lamp. In doing this a ladder was raised against the lamp-iron or bracket from which the lamp hung, and on the man mounting the ladder, owing to the wind and wet, the ladder slipped, and he, to save himself, clung to the lamp iron, and the shaking caused the lamp to fall. On examination, it turned out that the fastening by which the lamp was attached to the lamp iron was in a decayed state. The jury found there was negligence on the part of the gas-fitter, but no negligence on the part of the defendant; that the lamp was out of repair through general decay, but not to the knowledge of defendant; that the immediate cause of the fall of the lamp was the slipping of the ladder, but that if the lamp had been in good repair, the slipping of the ladder would not have brought it down. The defendant was held liable on the ground that if a person maintains a lamp projecting over the highway for his own purposes, it is his duty to maintain it so as not to be dangerous to the passengers, and if it causes injury owing to want of repair, it is no answer on his part that he had employed a competent person to repair it. Justice Blackburn held also that under the circumstances of the case it was shown that when defendant knew that the lamp wanted repair, it was his duty to put it in reasonable repair; and the person he employed having failed to do so, defendant was liable for the consequence of the breach of duty.

Another case that seems a hard one was the following:—

The plaintiff and defendant occupied adjoining houses. A drain, commencing on defendant's premises, passed under and received the drainage of other houses; it then turned back under defendant's house, and passed under the cellar of plaintiff's house. The part of the return drain under defendant's house being out of repair, the sewage escaped, and did damage to the plaintiff's house. The defendant was unaware of the existence of the return drain, but it was held that he was liable for the damage done to the plaintiff. The lie as to onus of liability in the cases of accidental nuisance, whether on the occupier, or the landlord, appears to be a very fine one.

The above are cases of accidental nuisances, but there is a large class of nuisances which are not accidental, but incident to the carrying on of various businesses.

With regard to these, constant disputes arise; and if one's business or health is interfered with and prejudiced, recourse to litigation is frequently had, to get the grievance redressed, and the injury stopped.

The business of a photographer is not of a nature to inflict injury on neighbours. The injuries suffered by complainants are occasioned in various ways, but I cannot see that they need be created by the readers of these papers.

On the other hand, it is likely enough that the photographer's business may be impaired by these matters arising on the premises of a neighbour.

The nuisances most frequently complained of are—noise, smoke, vibration, offensive smells, noxious vapours, &c. The establishment of a hospital may also be a nuisance. The remedy for these matters is by application for an injunction to prevent the continuance or recurrence of the nuisance, and by a claim for damage in respect of injury already suffered.

Proceedings may be taken in the High Court of Justice, and either in the Queen's Bench or Chancery Division. If in the former, the action may be tried with or without a jury. As to the expediency of having a jury, opinions differ. It is noticeable that since the option of having or dispensing with a jury has been introduced, about half the common law cases are tried without juries. And when such a verdict is given as in the following case, one is rather surprised that the proportion of non-jury cases is not greater.

An action was brought against the defendant for keeping noisy dogs, and keeping them so near the plaintiff's



house that his family were prevented from sleeping at night, and were very much disturbed during the day; but though the plaintiff produced evidence and the defendant did not, the jury found a verdict for the defendant. The plaintiff moved for a new trial, but this was refused. Had the action been tried by the judge alone, no doubt the verdict would have been the other way. This case has sometimes been cited as an authority, that to keep noisy dogs is no nuisance; but it cannot properly be so considered, as the Court is always very unwilling to grant the plaintiff a new trial where the jury have decided against him, and there is no complaint of any miscarriage as regards evidence.

It is not in every case of inconvenience that the Court will give redress. Where there is only interference with personal comfort the nuisance must be serious to ensure its intervention. Where property is injured, a less degree of injury will suffice. The law on this point, and as regards offensive trades generally, was laid down in the case of *Tipping v. St. Helen's Smelting Company*, referred to in a recent number.

As in this case the verdict of a jury for the plaintiff was confirmed by the Court of Queen's Bench, the Exchequer Chamber, and the House of Lords, it must be considered a leading case on the subject.

The plaintiff in this case alleged that he was possessed of a dwelling-house in which he dwelt—with gardens, parks, and farms adjoining—and was entitled to other lands near and adjoining in the possession of his tenants; and that the defendant erected smelting works near to the plaintiff's house and grounds, and injuriously caused to issue from these works offensive and poisonous smokes, stinks, stenches, gases, and vapours, which spread themselves over the plaintiff's dwelling-house, lands, and premises, and impregnated and corrupted the air, and settled on the soil and on the hedges, trees, &c., and that by reason of the defendant's acts the hedges, trees, &c., were greatly injured, and the plaintiff's cattle and live stock became unhealthy and diseased, and his dwelling-house and premises were less comfortable, and the neighbouring property was injured, &c.

The judge, on summing up at the trial, directed the jury that every man is bound to use his own property in such manner as not to injure the property of his neighbour; that the law does not regard trifling inconveniences, but that everything must be looked at from a reasonable point of view, and that, therefore, in an action for a nuisance to property by noxious vapours arising on the land of another, the injury, to be actionable, must be such as visibly to diminish the value of the property, and the comfort and enjoyment of it, and that in determining the question the time, locality, and all the circumstances should be taken into consideration.

The jury found a verdict for the plaintiff, and in answer to questions put, found that the value of the plaintiff's property was seriously diminished, that the defendant's business was an ordinary copper smelting business, and was conducted in as proper and good a manner as possible, and in a proper place.

In this case it will be observed that both the value of the property was depreciated, and the plaintiff's personal comfort interfered with.

A person may carry on a lawful trade, though a disagreeable one, notwithstanding it is carried on so near the house of another as to be an annoyance to him, provided the trade is so conducted that it does not create an absolute nuisance in law. But, if a nuisance is created, it is no answer to say that the place where the trade is carried on is a fit and convenient place for such a trade, and that in the exercise of the trade there is only a reasonable use by the defendant of his own property. The spot may be very convenient for the defendant and for the public at large, but very inconvenient to a particular individual, who chances to occupy the adjoining land; and proof of the benefit to the public of a particular trade in a particular

locality can be no ground for depriving any person of his right in respect of the particular injury he has suffered.

If a bad smell be complained of, though it be not absolutely injurious to health, yet if it be noisome and sickening, keeping all who inhale it in a state of chronic discomfort, it is actionable (brick burning, for instance). Lord Justice Knight Bruce said, in a case in point, "Mere insalubrity, mere unwholesomeness, may be out of the case, but the same may perhaps be asserted of melted tallow and other such inventions, less sweet than wholesome. Smell may be sickening, though not in a medical sense."

Smoke, unaccompanied by noise or noxious vapour, although not injurious to health, may constitute a nuisance. Lord Romilly said, in *Crump v. Lambert*, "There is, I apprehend, no distinction between any of the cases, whether it be smell, smoke, noise, vapour, or water, or any other gas or fluid. The owner of one tenement cannot cause or permit to pass over or flow into his neighbour's tenement any one or more of those things in such a way as materially to interfere with the ordinary comfort of the occupier of the neighbouring tenement, or so as to injure his property."

Noise is an actionable nuisance. Ringing of church or other bells in excess, so as to prevent people maintaining conversation, is such. So is the setting up of a powerful brass band which played twice a week in the immediate vicinity of a house.

As before stated, the establishment of a hospital may be a nuisance, and the case of *Tod-Heatley and Elliott and Fry v. Benham*, is the latest on this point.

This was an action brought by the landlord and Messrs. Elliott and Fry, photographers, the occupiers of premises in Gloucester Road, South Kensington, to restrain the carrying on of the Jubilee Hospital, at which patients attended afflicted with various diseases, including diseases of the throat, skin, eye, rectum, and cases of fistula, and other repulsive disorders. Messrs. Elliott and Fry complained that the existence of the hospital interfered with their photographic business, patients sometimes mistaking their establishment for the hospital.

The injunction was granted, but on the complaint of the landlord, as being a breach of the covenants of the lease, which were against noisome, noxious, or offensive trades or businesses. The Judge held that this hospital might be injurious to the health of the neighbourhood. There was some conflict of evidence as to the character of the neighbourhood as regards respectability. The case is said to be under appeal.

It must be observed that if the party causing the nuisance has acquired a right to do the acts complained of by twenty years' possession, and has, during that time, committed them without interruption, this raises a prescription in his favour, and the remedy is gone.

#### NOTES FROM NEW YORK.

##### THE BOSTON EXHIBITION—REVIEW OF THE BOSTON CAMERA CLUB'S EXHIBITS.

RESUMING the review of the Boston Camera Club's exhibits, we come to Francis Blake's views; one, an enlargement of his well known cattle group, is excellent, also a group of sheep on a hillside. A view of a railway train going at a speed of 48 miles an hour was remarkably sharp; it was looking at the train as if approaching the observer.

Five instantaneous marine views by O. A. Eames, embraced in frames 189 and 191, attracted attention; they were mostly of the surf dashing against the high rocks at Nahant. Frame 191 was on the floor. In frame 190 he had a very good view entitled "Caratunk Falls, Kennebec River, Maine." A study of birches along the Charles river was particularly good. All of his work had the merit of being very clear, showing careful manipulation. Henry R. Hallet, of Brookline, Mass., not a member, showed a



fair group of a "Euchre Party" by the magnesium flash-light. Some of the figures were a little too close to the light, and apparently too much pyro was added to the developer, as the white dresses in the negative must have been too dense.

In the two frames by Horace C. Dunham, not a member, there was nothing of special note except, perhaps, a view of the Minot House, Concord, Mass., and this appeared to be a trifle under-timed. E. B. Bliss exhibited eighteen  $6\frac{1}{2}$  by  $8\frac{1}{2}$  views of Attleboro, Mass., in two frames. The work, as a whole, was excellent, being very clear and clean.

Among the pictures was one of "Cows grazing," which was of special merit.

Frederick A. Pratt had five frames of  $4\frac{1}{2}$  by  $6\frac{1}{2}$  views. The best was called "Doorway of Stone House." Other pictures comprised studies and portraits.

Some excellent Transferotype work by Edward S. Philbrick was shown, especially a few copies of photographs. He had some fine apple tree studies.

H. A. Latimer contributed a great variety and number of pictures, showing excellent work and careful manipulation. He took a diploma for best marine surf photographs, also for the best set of lantern slides. He had a number of  $6\frac{1}{2}$  by  $8\frac{1}{2}$  views in California, the Yosemite valley, also some fine Florida pictures, one entitled "Live Oak with Spanish Moss, Dr. Whitefield's Fairy Land, Indian River," being beautifully done. There were also views at St. Augustine, of the new hotels and grounds.

A frame of  $6\frac{1}{2}$  by  $8\frac{1}{2}$  miscellaneous marine views, some of which were by the detective camera, were particularly good. In portraiture he seemed to be equally successful, as was shown in two frames, one embracing an excellent group of baby pictures. There was also a capital portrait of a pug dog.

"Sunset Clouds" was very beautiful. He had an excellent bromide enlargement from a negative of the Natural Bridge, Va., but as the enlargement was not made by himself it calls for no special note, except that it was much darker and more brilliant than is usual.

In frame 244, which was on the floor, were some good interiors of Hotel del Monte, Monterey, Cal.

One frame exhibited by C. A. Robbins contained a number of miscellaneous views, one of "Wood Interior at Magnolia, Mass." being the best. In two or three cases his pictures looked as if the lens did not cover the full plate, there being no picture at the corners of the plate. In general, his work indicated that he had under-developed.

In the two frames shown by R. A. Bullock, were several very pretty 5 by 7 camp scenes; he also had some good snow views.

David Mason Little had two large splendid photographs of the yachts *Puritan* and *Thetis* under sail; the pictures were particularly spirited, since the boats were flying along under a strong breeze. His "African Lotus" was one of the best flower pictures in the exhibition.

Three frames by Jos. A. Frizzell showed fairly good work, printed on ready sensitized paper. As a general thing his negatives were too hard or else too thin, from over-exposure.

Chas. Storer had a frame of sixteen portraits; there was nothing specially noteworthy about them; if anything, some of the negatives were a trifle under-timed.

In frame 283, which was on the floor, were several views around Pittsfield, N.H., by W. K. Means. In frame 204, he had a good interior (4 by 5) of an old "Stairway," a fair view of "Soldiers' Monument, Augusta, Maine," and a peculiar picture made out of doors by the electric light, of a tree covered with damp snow. The marked contrasts in this were very effective and novel.

Chas. E. Davis, Jr., in his four frames had some beautiful landscapes, mostly 5 by 8,  $6\frac{1}{2}$  by  $8\frac{1}{2}$ , and 8 by 10, in size, embracing scenery in Brookline, Auburn-dale, and along the Charles river, Mass., as well as

excellent views in Virginia. His work was very creditable both as regards its artistic merit and technical qualities.

In frame 286 were ten 5 by 8 pictures of waterfalls, and a few others mounted upright side by side, very close together in military order. The work here was spoiled in the rigid method of framing.

287, called "Hancock, Md.," consisted of three 5 by 8 views joined together in panorama fashion very neatly.

Dr. R. R. Andrews, in frame 316, had a pretty portrait picture of a little girl with a candle in her hand going to bed. He received a diploma for the only photo-microscopic work shown, consisting of a set of eight lantern slides illustrating the growth of the human teeth. In lantern slides, Arthur Plimpton contributed a set of six; Miss A. L. Richards the same, among which was a copy of her "June Sunset," which appeared very beautiful on the screen; Wm. G. Reed, the treasurer, two sets of six; William S. Briggs, three sets of six, many of which were of excellent quality; Henry N. Sweet, a set of six; O. A. Eames, a set of six; H. A. Latimer, two sets of six, one of which was the prize set.

In transparencies, Miss A. L. Richards and Edward S. Philbrick were the only exhibitors; the latter's "View in Newport Harbour, Narragansett Bay," was particularly well done.

Considering the work of the Boston Club in general, it may be said that it compared very favourably with that shown last year, exhibitors of last year having, if anything, improved in technical excellence. Many new exhibitors appeared, showing, in the main, good work, who, stimulated by the exhibition of this year, will doubtless do better next time.

The subject of the next review will be the exhibits of the New York and Philadelphia Societies. SULPHITE.

New York, June 2nd, 1888.

## Review.

PHOTOGRAPHY MADE EASY. A Manual for Beginners. By W. F. Stanley. Tenth edition; price sixpence. (London, 1888: Published by the Author at 13, Railway Approach, London Bridge.)

THE author has brought his little handbook well up to the time, and it includes quite information enough to enable anyone to make a beginning in photography. Besides the negative process with gelatino-bromide plates, and the usual process of silver printing, we find a chapter on enlargements, notes on magic lantern slides, the blue processes, photo-micrography, and a few pages of miscellaneous formulæ.

ELECTRICAL INSTRUMENT MAKING FOR AMATEURS. By S. R. Bottone. Second edition, cloth, 180 pp. Price 3s. (London, 1888: Whittaker & Co., Paternoster Square, E.C.)

SO often does the photographic experimenter require to make and use electrical instruments, that the book before us should be a welcome addition to every photographic library. Moreover, the author possesses the excellent faculty of making his meaning clear.

WE find in Mr. Bottone's book clear directions for making—and this with very few tools—such apparatus as rotary influence machines, induction coils, thermopiles, resistance circuits, and other staples of the electrical laboratory, and, what is perhaps of more importance, numerous general manipulatory details applicable to electrical work in general.

PRACTICAL EDUCATION: TREATING OF THE DEVELOPMENT OF MEMORY, THE INCREASING QUICKNESS OF PERCEPTION, AND TRAINING THE CONSTRUCTIVE FACULTY. By Charles G. Leland; 272 pages. Price 3s. 6d.

HERE we have a book which may well set the present day



teacher thinking, as the practical education of our author is a very different thing from the commercial education of our schools.

To develop the powers of observation, remembrance, and construction is the true system of education, according to Mr. Leland; in other words, to awake that artistic faculty which exists in every person. "Under artistic," says our author, "I include all technical or manufacturing work, whatever;" rather a wide definition, certainly, although, when one comes to consider the matter, it is a little difficult to draw an absolute line between the construction of a poem or a painting on one hand, and the construction of a shoe polishing brush on the other hand; although, maybe, some would argue that the latter is rather a means towards the delight of bright boots than an object of delight in itself.

Let us not, however, misrepresent Mr. Leland, who only recognizes as a work of art that upon which the artist has worked, and in reference to this point he says:—

Machinery a generation ago promised to increase art by multiplying cheap copies, and the result has been that it has almost extinguished everything original in it. But the vast increase of culture has of late brought cheap duplicates into disfavoured. People are beginning to learn the great truth that no real work of art can be made by machinery. That is most artistic which most shows the hand and soul of a maker. When this principle shall be firmly established as a canon, as it certainly will be, there will also be a demand for much labour which is now without employment. Work fully equal to the mosaic pavements of Roman villas, and all the exquisite ornament of the Middle Ages, could all be designed and made by women, children, and a vast army of men who by some fatality cannot succeed at more prosaic employments. That machinery can aid art is true, for every tool is to a certain extent a machine, but that a copy made and multiplied entirely by machinery is artistic is false. The vulgar and ignorant call everything which is beautiful and artificial "artistic;" the educated know that the term is only applicable to a work which shows the direct art of a maker and the action of a mind.

The author advocates the establishment of art schools in every industrial centre, and, moreover, schools, the principle function of which shall be to give opportunities for the pupils to make manifest their ideas, rather than places where they follow slavishly the dictates of one who chooses to call himself a master. He says:—

In an ordinary experimental school we first need a room. The upper storey of a city school, when not in use, is perfectly adapted to the purpose. It should of course be well lighted. Tables made of two-inch plank, placed on very strong, firm trestles, are requisite, particularly if wood-carving and brass-work are contemplated. Such tables do not rock. There must be abundant shelving for many purposes. The pupils will every one require a place whereon to put half finished work. There must of course be chairs and a blackboard. An adjacent small store-room or large closet will be a great convenience. If this be wanting, a large plain wooden cabinet must be provided.

The book contains a fund of information and suggestions which should render it valuable to all interested in progress.

### Notes.

At the meeting of the Royal Meteorological Society to be held next Wednesday (the 20th) evening, at 25, Great George Street, Westminster, there will be presented and read the first report of the Thunderstorm Committee, on the Photographs of Lightning Flashes, drawn up by the Hon. Ralph Abercromby.

One excellent rule is observed by the Meteorological Society: that of arranging that all papers shall be in type before the meeting, and that any Fellow wishing to take part in the discussion can obtain a copy on application to the assistant secretary.

The indifference shown by the authorities towards the National Portrait Collection is not very encouraging to those who, having valuable pictures of bygone celebrities in their possession, may be disposed to present them to the nation. The history of the National Portrait Gallery is one succession of snubs. First stowed away in a room in Great George Street, Westminster, it at length gravitated to the centre of sweetness and light at South Kensington, and was graciously accorded a shed adjoining which the refreshment contractors were allowed to place their kitchen. In due time the usual result followed: the kitchen chimney caught fire, and this unique collection of pictures, impossible to be replaced, narrowly escaped destruction. The pictures were then relegated to something like their original obscurity at Bethnal Green, but only for a term. This term has now expired, and it is gravely proposed to move them back to the wooden shed at South Kensington. Bethnal Green is not the most suitable place for the gallery, and we are bound to say that it here attracts little notice—a lady student and a policeman being the sole occupants when we visited the place a little time ago—but it is at least safe. Suggestions have before now been made for a national collection of photographic portraits in some enduring process, so that posterity may have the advantage, denied to us, of knowing how historical personages absolutely looked; but this is hopeless, judging by the attitude of the custodians of the National Portrait Gallery.

The suggestion made last week by our New York correspondent as to the advisability of limiting the number of pictures, of a certain size, sent in by each exhibitor to the next exhibition of the Philadelphia, New York, and Boston Photographic Societies, is one that might be considered by the Photographic Society of Great Britain. Each year, for six years back, with the exception of 1884 and 1886, when there was a singular falling off, the number of pictures sent in has increased. Last year the photographs numbered 1,784, being an increase of nearly 300 over the number hung in 1886. If this ratio be maintained, it is clear that sooner or later the walls of the Gallery will be covered, and the ceiling alone will remain available. Of course it may be said that no one is bound to look at any of the pictures save those on a comfortable level with the eye, but the temptation to see what the others are like is too strong to be resisted.

The rule of any exhibition should be that what is worth accepting is worth hanging in such a position as it can be fairly seen. It is only daring innovators, like Mr. Whistler, who have the courage to do this, and the result of his experiment at Suffolk Street last year has been to oust him from the Presidency of the Society of British Artists this year. The kindly spirit of judges and hanging committees is natural enough, but while it favours the exhibitors, it entails much misery upon the visitors. We do not know why the latter should not be considered as well as the former. So far as photography is concerned, this kindly spirit in some cases is distinctly abused. We have heard of instances where it has been turned to advertising



purposes. For example, Mr. A. sends in a picture to the Pall Mall Gallery. It is without a particle of interest, but it may satisfy manipulative conditions, and so it is admitted, the authorities compounding with their consciences by skying it. This is of not the least consequence to the photographer, who boldly advertises on his show-case, "Exhibitor at the Photographic Society's Exhibition," carefully omitting to state, of course, that his contribution was so hung that it could not possibly be seen.

Surely this is not the end to which a photographic exhibition ostensibly in the interest of art and progress should be turned. The photographer who uses it for advertising purposes in the way described is not worse than the man who parades his medals in his trade circular or shop window, and we do not so much blame those who make the exhibition a trade tool, as the rules, or rather absence of rules, which allow them to do so. In the early days a little laxity in this respect might be admissible; but now that photography claims, and on its own merits is entitled to, a higher position from an art point of view, a severer code of ethics is necessary, and the outward and visible sign of this code should be in the regulations for the exhibition of pictures. As a step towards this, the abolition of the medal system this year by the Photographic Society may be welcomed.

The *Photographic Times*, so long published in New York, has, we presume, come to an end, as we have seen nothing of it for a good many weeks. A new publication under the same name has now very opportunely been established in Liverpool.

H. H. Turuer and A. A. Commou, editors of the *Observatory*, have raised a serious question in connection with the Astronomical Congress which met last year in Paris, for the purpose of preparing a photographic chart of the heavens. Resolutions practically approving the idea were passed, as also was one in which it was decided to take "a second series of plates down to the 11th magnitude, in order to ensure greater precision in the micrometric measurement of the reference stars, and render possible the construction of a catalogue. Since the holding of the congress the "Bureau du Comité international permanent pour l'exécution photographique de la carte du ciel," has published a paper by Dr. Gill containing, to quote the words of the *Observatory*, "the astounding proposition of catalogueing no less than 2,000,000 stars; that is to say, Dr. Gill gravely and seriously proposes the establishment of a central bureau consisting of chief, assistant secretaries, and a staff of measurers and computers to take the photographs, and measure them and make a catalogue, the work to go on for twenty-five years at a cost of 250,000 francs, or £10,000 per annum, or for fifty years at 150,000 francs."

This proposition the editors denounce strongly, not only because of its expense and probable uselessness, but because it is an attempt to tack on to the work decided upon by

the Congress, a gigantic task which the Congress did not contemplate and did not sanction. If such a catalogue is necessary, as stated by Dr. Gill, "a new Congress might discuss it, but the one which met in 1887 is not in any way committed to such a scheme." This protest appeared in the May number, and in this month's issue Admiral Mouchez and Mr. Knobel reply; the purport of their answers being that the matter is not a new one introduced by Dr. Gill, but that it was discussed at the Congress, Mr. Knobel contending that the word "catalogue" in the resolution quoted above "means a catalogue of all stars to the 11th magnitude—probably some two millions." The editors are, however, not convinced. They maintain that although mention of a catalogue was made, this term cannot be supposed to sanction a catalogue of 2,000,000 stars without further specification, and they go on to point out that "stellar photography being as yet in its infancy, it is suicidal to attempt anything which will commit us to a course of action extending over more than a very few years." On the merits of the question we do not offer an opinion, but it may be asked how it happens that the proceedings of the Congress were so loosely conducted that so serious a difference in regard to what was and what was not decided upon has arisen?

Incidentally Admiral Mouchez refers, in his letter, to the cost of stellar photography. He says that astronomers, after a long experience, estimate that the observation and calculation of a star come to about 10 francs, and for the Paris Observatory this estimate is rather low. The 2,000,000 stars will therefore cost 20 million francs.

Composite portraits of the insane have been made by Dr. W. Noyes, of New York, who claims to be the first who has applied the idea in this direction. Two "composites" appear in the *New York Science* for last month, one being made from eight patients suffering from melancholia, and the other from the same number suffering from paresis. Dr. Noyes is of opinion that mental diseases offer an excellent field for the study of types, and thinks that further work in this line may give a more just conception of the typical expression in the different forms of mental diseases than has hitherto been obtained from portraits of individual cases.

## REPRODUCTIONS BY THE GELATINE PROCESS.

BY C. BRANGWIN BARNES.

THOUGH, now and again, at varied intervals, we hear an outcry about the lack of "sparkle" in gelatine negatives as compared with those by the old wet collodion process, it is pretty generally acknowledged that for general portraiture and landscape work the dry plate gives equally good results to the wet; but when reproductions or copies, especially of black and white subjects, are required, there are many photographers who unhesitatingly pronounce in favour of the old process. For ordinary copies—that is, copies of photographs or paintings—the gelatine plate in my opinion stands ahead of the collodion; but as regards reproductions of architectural plans or designs, I have, until recently, given collodion the preference. After considerable experiment I have, however, come to the



conclusion that equally good results may be obtained with gelatine, and write this article to the end that others as well as myself may profit thereby. In an ordinary photographic business, plans are not required to be copied very often, and it is hardly politic to keep a silver bath by one for the sake of making such copies when ordered, to say nothing of the danger of using such a bath in a dark room where development of dry plates with pyro and ammonia is carried on.

I find that an aplumatic lens gives, as a rule, the best results in copies of this kind, it being extremely difficult to obtain a perfectly true reproduction of lines with any other, and would advise the use of a T square to ensure exactness in the position of the camera, and the plan to be copied, which copy is mostly required to be done to scale. Rapidity of exposure being of no consequence, it will be found that a slow plate gives a much better result than a quick one, added to which the exposure can be more accurately calculated, and accuracy of calculation is in this case a *sine qua non*, an under-exposed plate giving a poor negative, which no amount of intensification will transform into a good one, and over-exposure having a strong tendency to veil or partially obliterate the fine lines of the plan.

The light should be obtained from such an angle that no reflections are thrown into the lens, taking care that an even illumination is thrown all over the picture. I do not recommend direct sunlight to be used, though I have seen good results so obtained. The developer should be strong in pyro and bromide, and weak in ammonia, and the negative should be allowed to take its time in coming out. I usually make a special developer for this class of subject, allowing the plate to soak for four or five minutes in the pyro and bromide, and then adding one or two drops of weak ammonia to start development; if the image comes up too quickly for my liking I add more bromide, but am always particularly sparing of the ammonia. The plate should take fully a quarter of an hour to develop, and the result will be in nearly every instance a negative capable of yielding a good print, with dark lines on a white ground. Should the negative be required for photo-lithographic purposes, it will sometimes be found necessary to intensify it, and for this I would certainly recommend the use of mercury, either the ordinary bichloride of mercury (saturated solution) followed by ammonia or Edwards's intensifier. If the former is used, care must be taken that the mercury solution is perfectly clear, as any white sediment has a tendency to settle on the film and spoil the crisp sharpness of some of the lines, especially of the finer ones, some of which will necessarily, in a reduction, be very fine indeed. The cliché should be allowed to become perfectly white in this, ten minutes' immersion not being too long, and should be thoroughly and completely washed before immersion in the solution of ammonia, in which another ten minutes or quarter of an hour will do no harm. By this method I have obtained negatives in which the lines were almost clear glass, and the remaining portion perfectly opaque.

Prints from a negative of this class can be made on salted paper, and have every appearance of lithographs or drawings.

In cases where there is much blue colour in the plan or design, it may be found advantageous to use isochromatic plates for the purpose of reproduction. For copying oil paintings or water-colour drawings, these plates should always be used, the results being far preferable to those obtained with the ordinary make.

#### ON THE DISC OF CONFUSION AS PRESENT IN PHOTOGRAPHIC OBJECTIVES.

BY J. J. HIGGINS, A.M., M.D.\*

WHEN the ground glass of the camera is adjusted to the focus

\* From the Philadelphia Photographer.

of an object, other objects more or less distant from the object focussed on are indistinct in outline, or, as usually expressed, deficient in sharpness and definition. This is due to the disc of confusion which exists in all such cases being greater than is undiscernible by ordinary vision or inspection. If, with

Dallmeyer, we take the  $\frac{1}{100}$  of an inch blurring (for that is

what the confusion disc in reality is) as sufficiently small, our tables will of course be far different from those based upon a less error, as, for instance, on only 0.1 mm. (the tenth of a milli-

metre, equal to the  $\frac{1}{250}$  of an inch) as considered necessary

by Eder.

That the  $\frac{1''}{100}$  is easily discernible and would be too great an

amount of blurring for fine work, does not admit of question. For detective exposures, where the element of sharpness is by no means such an essential factor, it is undoubtedly adequate, and in general is the usual basis of calculation.

The laws governing the formation and magnitude of such disc—the laws by which the greater and less distances of objects from that in absolute focus may be determined, and yet have them in apparently equal focus (this difference between the greater and less distances being known as the depth of focus of a lens)—the laws applicable to it with lenses of differing foci and corresponding opening, and again with lenses of differing foci and varying aperture, or again, as affected by simple alteration of aperture, accompanied by equations and formula for solution—will make a subject having quite an appropriate name easily understood, but especially so when by the aid of diagrams its elucidation is assisted.

In the consideration of the disc of confusion it is to be noticed first of all that it is not a simple disc, but of a compound nature, being composed of an anterior and a posterior disc united in the focal plane of the object focussed upon. When these are of unequal magnitude, we have in addition that which is known as the circle of confusion. If, e.g., two coins of unequal size are centrally superimposed the one upon the other, the marginal difference between the two is the analogue of the circle of confusion.

In the subjoined diagram let  $F$  = focus of lens,  $f$  the focus of a near object, and  $f'$  (not lettered on diagram) the difference between the two, i.e.,  $f - F$ . Being drawn to scale, if diameter of lens is regarded as two inches,  $F$  will equal two inches,  $f$  four inches, and  $f'$  (equals  $f - F$ ) two inches. Furthermore  $a$  equals one inch, and  $p$  two inches.\*

If now an object in the far distance was focused on, the focus would be at  $F$  (or at least virtually so), and the ground glass of the camera be there situate. A nearer object, however (in accordance with the law that "as an object approaches a lens its image recedes from it"),\* would on a given proximity to camera

\* The heavy full lines indicate the rays coming (from a distance) to a focus at  $F$  the focal point of lens, and then continued as a lighter full line for illustration of posterior disc. The dash lines and line marked  $a$  are for illustration of anterior disc. The double shaded unlettered line is for subsequent consideration.

† For obtaining the distance of image ( $-I \Rightarrow$ ) on ground glass from lens (centre), the distance of object ( $-\ominus \Rightarrow$ ) being given, divide the distance of object, by the distance of object less the focus divided by the focus—

$$-I \Rightarrow = \frac{-\ominus \Rightarrow}{-\ominus \Rightarrow - F}$$

Or again—

$$-I \Rightarrow = \frac{-\ominus \Rightarrow \times F}{-\ominus \Rightarrow - F}$$

To find distance of object, the distance of image (ground glass) from lens (centre) being given: divide the square of the focus by the distance of ground glass from the lens less the focus, and to the quotient add the focus.

$$-\ominus \Rightarrow = \frac{F^2}{f - F} + F$$

Or

$$-\ominus \Rightarrow = \frac{-I \Rightarrow \times F}{-I \Rightarrow - F}$$

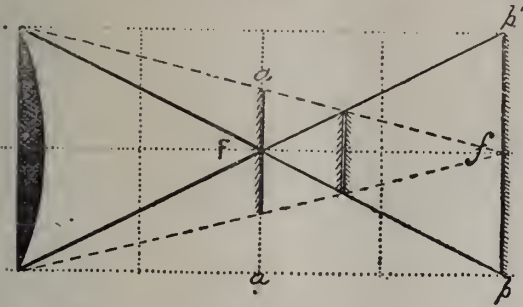
Or again—

$$-\ominus \Rightarrow = \frac{F \times f}{f'}$$



have its focus at  $f$ , and the disc of confusion caused by such nearer object to exist on the ground glass placed at  $F$ , and represent

Diagram 1.



Confusion Discs.

sented in diagram by  $a$ , is termed the proximal or anterior disc of confusion.

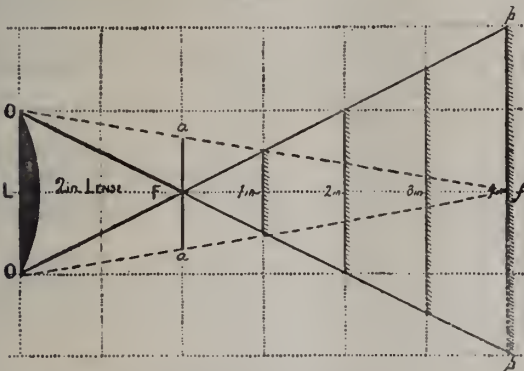
If, on the other hand, the ground glass of camera was focussed on a nearer object, as *e.g.*, on one whose image would be at " $f$ ," then the far distance would produce the confusion disc  $p p$ , and this is known as the distal or posterior disc of confusion. Unlike the anterior confusion disc, it is determined by the rays from an object (full lines in diagram) coming to a focus at a point nearer the lens " $F$ ," and then crossing and being continued unto the ground glass set at a greater length of focus " $f$ " for a nearer object. As with the anterior disc its magnitude is dependent upon the opening or aperture of lens and the difference between the respective foci of the objects; the influence, however, of aperture and  $f'$  being far different in the case of the one as compared with the other. As seen, it is larger than the anterior disc, and therefore when there is no special reason to the contrary, it is evidently preferable to focus on the distance.

#### CIRCLE OF CONFUSION.

The circle of confusion is the difference between the two discs. If, as should be, the ground glass is at such intermediate point that the posterior disc is equal, and only equal to the anterior disc as shown by double shaded line, then no circle of confusion exists. And although subsequently more special attention will be directed thereto, it may be well to notice the inequality of its location between the foci ( $F$  and  $f$ ) of the two objects.

The posterior confusion disc seen at " $f$ " (Diagram 2) is that caused by a far distant object, the focus of which is at " $F$ ," to

Diagram 2.



Posterior Confusion Disc.

be formed upon the ground glass of camera set to the focus of a nearer object at " $f$ ." In the diagram,  $F$  represents the focus of lens = two inches, and " $f$ " the focus of nearer object = six inches. The difference between the two ( $f - F$ ) equals four inches, and is known as  $f'$ . It is apparent on inspection of diagram that with full opening of lens\* the posterior confusion disc  $p p$  is equal to its distance (that of the ground glass) from  $F$ —i.e., is equal to " $f$ "; and that the same is true of each or

\* The term full opening of lens is used in these pages as expressive of a lens with diameter equal to radius of focus, and must not be confounded with the term as used when speaking of lenses mounted for use.

any distance—*e.g.*, whether of four inches, three, two, or one inch, or other focus. And this law holds good for all lenses, whether of shorter or longer focus. We have then the posterior confusion disc with all lenses irrespective of focus equal on full opening to its distance from " $F$ " or otherwise expressed to " $f$ " and that its size increases and decreases pro rata with such distance.\*

The mathematical demonstration (as diagrams are mainly only illustrative) is based upon the similarity of the triangles  $O F O$  and  $p F p$ . For from such similarity we have—

$$LF : Ff :: OO : pp.$$

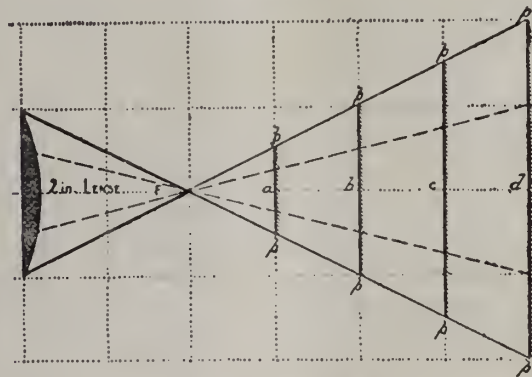
But  $LF = F$ ,  $Ff = f'$ ,  $OO$  = full opening of lens  $O$ , and  $pp$  equals the posterior disc, and the proportion becomes by substitution  $F : f' :: O : \text{posterior disc}$ . Whence the equation: the

$$\text{posterior disc} = \frac{O \times f'}{F} \text{ reduced by caucellation, as } O \text{ and } F$$

are always like quantities, to the posterior disc =  $f'$ . Q. E. D.

By reduction of aperture as indicated by dash lines (diagram 3) it is evident that the posterior confusion disc is reduced in size. This reduction of aperture it must be borne in mind exists in all lenses as sent out by their makers, the peripheral portions of lenses being not only useless but harmful to their performance, and consequently ablated. Again, that the ratio of such reduction is pro rata with that of the aperture, as seen at  $a$ ,  $b$ ,  $c$ , and  $d$ . The reduction represented in diagram is one-half  $\frac{F}{2}$ ,†

Diagram 3.



Posterior Confusion Disc.

and the perpendicular shaded lines  $p p$  show the posterior confusion disc at any and all points to be between dash lines of exactly half the size of those present between full lines. If the reduction of opening was one-quarter  $\frac{F}{4}$ , then the corresponding posterior confusion discs would be of only one-quarter the size, and so on. If now, we divide the posterior confusion disc as existing at any given distance from  $F$  on full opening of lens, by the denominator of the intensity ratio as expressed by

$\frac{F}{n}$ , " $n$ " representing the numeral—equals  $\frac{f'}{n}$ , or multiply it by the lineal diameter of the aperture divided by  $F$ ,—equals  $\frac{A \times f'}{F}$ , we have its magnitude at said given distance with or on such reduction of aperture.

#### Formula.

Size of posterior confusion disc for a given distance from  $F$  on reduced aperture, } =  $\frac{A \times f'}{F}$  or " $\frac{f'}{n}$ "

To obtain the distance of screen from  $F$  ( $f'$ ) for any given magnitude of the posterior confusion disc on reduced aperture, multiply the given magnitude by " $n$ ."

\* Consequently the larger the lens with " $f$ " equal, the less in proportion is its size.

† To obtain the lineal size of stop, the intensity ratio  $\frac{F}{n}$ , being given, divide the greater number (giving to  $F$  its value) by the lesser, and place accordingly over or under "unity." To obtain the intensity ratio of stop " $n$ ", the lineal size being given, divide the focus by lineal diameter of stop.



*Formula.*

Distance from  $F(f')$  of posterior confusion disc for any given magnitude on reduced aperture, } = the required disc  $\times "n."$

To obtain the distance from  $F(f')$  at which a posterior confusion disc would on full opening be equal to (and only so) a given one existing with reduction of aperture, divide the  $f'$  of reduced aperture by " $n$ ."

Again, to obtain the distance of screen from  $F(f)$  at which the posterior confusion disc would on reduction of aperture be equal to (and only so) a given one existing with full opening, multiply the  $f'$  of full opening by " $n$ ."

If " $f$ " is desired, add  $F$  to the answer of either formula.

(To be continued.)

### PHOTO-LITHOGRAPHIC TRANSFERS.

BY W. T. WILKINSON.\*

THE first method is what may be called the original method, which is nearly as old as the wet collodion, and which, for the purpose of identification, may be called "Osborn's process." The prints which are passed round are from negatives in line upon paper coated with—

Gelatine (Nelson's No. 3 flake)	...	3 ounces
Water	...	20 "

Let the gelatine soak until soft, then melt, and add (stirring all the time) one dram of a ten-grain solution of chrome alum; strain through muslin into a clean dish standing in a larger dish containing hot water. Upon this hot solution of gelatine, good stout writing paper (wove, not laid) is floated, and then hung up to dry, and, when dry, again floated, this time hanging up to dry by the opposite corners, so as to equalize the coating of gelatine. This paper, when dry, will keep any length of time; in fact, the older it is the better. For use, this paper is immersed in a solution of bichromate of potash, one ounce; water, twenty ounces, for three minutes, then laid face down, upon a sheet of clean glass, and gently squeezed, to get rid of superfluous solution, then removed from glass and hung up to dry in the dark room. When dry, the paper is exposed to light under a suitable line negative for about five minutes in sunlight, or, if in the shade, from fifteen to thirty minutes; the image is visible during printing, but should not be examined too often, else the paper may cockle and the light get at it, so that time exposures are the best. The next operation is to convert the photographic prints into an ink transfer, which is done by first of all immersing the print in clean cold water until the gelatine protected from the light by the opaque portion of the negative has absorbed sufficient water to resist the greasy ink. Whilst the print is soaking I will take a little of Winstone's photo-lithographic transfer ink and thin it with a little turpentine so as to bring it to working consistency, mixing the two with a palette knife; a glue roller is now coated with this thin ink, and the soaked gelatine print, having been removed from the water, is laid upon a slab of plate glass, one end of the print being folded underneath the glass so as to hold it during the rolling up; the superfluous water is now removed either with blotting-paper or a soft cloth, showing the image in slight relief. The glue roller charged with the thin ink is now passed over the print, and the action being continued, the black smudge of the first rolling gradually rolls away, leaving, as you now see, the image in black ink on a white ground. Now, in order to ensure all the white being clean, and save trouble after transfer to the stone, dip a pledget of cotton wool into water and rub the transfer gently all over. This transfer is upon wove paper, the next one is upon a laid paper, and, as you see, breaks up under the rolling. The transfer being developed it is hung up to dry, after which it is ready for transfer to stone.

The second method is that of Husnik, whose paper, as sold by Messrs. Winstone and Son, of 100, Shoe Lane, is now to be used. This paper, coated first with a film of gelatine and then albumen, is sensitised by immersion in a bath of—

Bichromate of potash	...	1 ounce
Water	...	16 ounces
Methylated spirits of wine	...	4 "

To this solution is added liquor ammonia until of a light yellow colour instead of orange red. The paper must only be drawn through this solution slowly, not left in for any length of time, and then dried in a hot chamber as quickly as possible. When

dry, expose in the sun about three minutes, then, whilst dry, roll up with the glue roller charged with Winstone's photo-lithographic transfer ink thinned with turpentine, taking care to only get a very thin coating of ink; in fact, the best guide is that the image must be visible under the ink. The ink print is now immersed in clean water, and, after soaking a short time, is removed and laid upon a glass slab, and, as you now see, a gentle rubbing with a pledget of wet cotton wool removes the ink from the whites, leaving it only upon the lines. The subsequent operations of transferring to stone are the same with the transfers prepared by both methods which have been demonstrated to you. The ink transfers are first of all placed in a damping book (which is made by saturating alternate sheets of blotting or brown paper) until they are quite soft and limp, and, as this takes a little time, two transfers were placed in this book earlier in the evening by Mr. Lesty, who, being a practical lithographer, I am very pleased to hand over to him the task of transferring to stone, which he will now do, using a press which has been kindly sent here by Messrs. Winstone, the other necessary materials being supplied by our Hon. Secretary.

### Patent Intelligence.

#### Applications for Letters Patent.

8146. ALFRED JULIUS BOULT, 323, High Holborn, Middlesex, for "New or improved support for photographic apparatus, which permits the camera to be connected with tricycles and bicycles, and by means of which the latter form the stand of the apparatus."—(Jean Delton, France.)—June 4th, 1888.

8242 REGINALD POLE STUART, Sandy Mount House, Woburn Sands, Bedfordshire, for "The improvement of dark slides for dry plates for photography."—June 6th, 1888.

Patent on which the Fourth Year's Renewal Fee has been Paid.

8643 of 1884. EDWARDS, B. J.—"Coating photographic plates."

Patent which has become Void through Non-payment of Duty.

4144 of 1884. ANDERSON, W. B.—"Colouring photographic prints."

#### Specifications Published.

10,344. JOHN KENNERELL, of Nos. 8 and 9, High Street, Wisbech Saint Peters in the Isle of Ely, in the County of Cambridge, Photographic Artist, for "Photographic camera clip."—Dated August 8th, 1887.

The object of my invention is a photographic camera clip, to be made of wood, which is to secure tightness and portability, consistent with utility, and capability of spanning, and being clamped to any object, and capable of supporting the smallest or largest photographic camera made.

It will grip anything from one-sixteenth of an inch to nine inches in thickness inclusive, and is capable of being made as rigid as the structure it is clamped to.

The said clip can be made of any kind of wood, but preference is given to birch wood.

The size of the spanning frame can be made unlimited, but I prefer to adopt two sizes, as being more suitable for the object of my invention, the larger size to span from one-sixteenth of an inch to nine inches inclusive, the smaller size to span one-sixteenth of an inch to five inches inclusive.

The spanning frames have ends suitably dovetailed, and are made of a convenient depth for the purpose before described.

In combination with the spanning frame and ends I have suitably threaded and fitted two screws, one called a hand screw, the other a sliding or adjustable screw.

The said screws are preferably made of beech wood.

The hand screw has a plate suitably fitted so as to work on its own axis, and the sliding screw has a fixed plate which is adjustable to any object by a screw nut.

Both screws being adjustable enables the operator to maintain the centre of gravity throughout the clip and camera, no matter what thickness (within its spanning power) the clip may be clamped to.

In combination with a spanning frame and clamping screws, I adopt a stem similar to a dumb bell in shape, the same being finger-jointed or the like, the joints working at right angles to each other, one from east to west, the other from north to south, and both are clamped with small bolts and fly nuts.

When both joints are unscrewed it gives the movement of a

\* Communication to the London and Provincial Photographic Association.



universal joint, and so enables the operator to level or point and fix his camera to any given point, either high or low.

The said jointed stem is dovetailed on and into the spanning frame, and fixed with a stop.

At the upper end of the stem is a camera table of suitable size dovetailed, and also fixed with a stop.

The camera table has a camera screw countersunk and made thin enough to pass through the ordinary female screw of the camera, and clamped thereto by a fly nut.

And in order that my invention may be thoroughly understood, I now proceed to describe the accompanying drawings thereof, reference being had to letters and figures marked thereon.

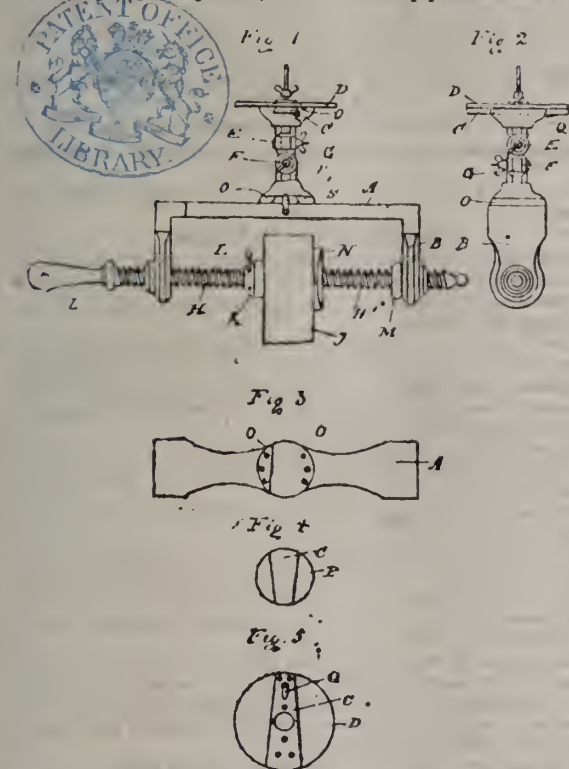
Figure 1 represents the front elevation of the apparatus, with the top piece of the clip marked A, the sides or ends of the clip marked B, the handle I, on the screw marked H, with the clamp K, pinned on the screw with the pin L, the other screw marked H', fixed with a nut M, and the clamp N, the whole being screwed to a block or post marked J. The top portion C, sliding in a groove between O, O, with the bottom joint F, working in one direction, and the top joint working on either sides, with the top plate or camera table D, fitted with a dovetail piece C, to slide in a groove on the piece U, and held in its fixed position by a tongue marked Q. The bottom parts is fixed by a tongue marked S.

Figure 2 is the end view of the clip.

Figure 3 is the top of the clip A, showing the pieces screwed on to form the groove, for the piece C to slide in.

Figure 4, is the base P, with the dovetail C, which slides in or is fitted to figure 4.

Figure 5 shows the underside of the top plate or camera table D, with the tapered piece C, to fix to the top part marked U.



Like letters give like parts in each of the figures.

A, top of the clip. B, sides or ends of the clip. C, dovetail pieces; D, top plate or camera table; E, top joint; F, bottom joint; G, the fly nuts; H, screw; H', screw; I, handle; J, the block or post; K, clamp; L, pin to clamp; M, running nut; O, pieces to form the grooves; P, the base; Q, the top tongue; S, the bottom tongue; U, the top of the swivel joint.

Having now fully described the nature and object of my invention, and the manner in which the same is to be performed, I claim as new and novel the following:—

1st. The combination of the apparatus, the camera clip for the purpose of clamping to any object, from a hedge stake to a 9-inch wall, and is intended to be used in the place of the ordinary

tripod stand; to fix the camera thereto; substantially herein described and according to the accompanying drawings.

2nd. The combination of the clip and for fixing the camera on the camera table, with the universal adjustments, for pointing the camera in any direction, for the use of photographers, substantially herein described and according to the accompanying drawings.

15,532. Dr. HERMANN WELHELM VOGEL, of 124, Kurfürsten Strasse, in the City of Berlin, Prussia, Germany, Chemist, for "An improved process for manufacturing isochromatic emulsion plates highly sensitive to light."—Dated November 29th, 1886.

My invention relates to an improved process for manufacturing isochromatic gelatine and emulsion and gelatine plates for photographic purposes, and to chemical preparations requisite for such said process.

In the year 1873 I made the discovery that chloride and bromide of silver, which are only sensitive to violet, indigo, and the blue light of the spectrum, can be made sensitive to green, yellow, and red rays by mixing the above-mentioned salts with bodies which absorb the latter rays.

If, for instance, chloride or bromide of silver is mixed with aniline red, which absorbs yellow rays, the chloride or bromide will become sensitive to yellow rays; or if the chloride or bromide of silver is mixed with aniline green, which absorbs red rays, the same will be made sensitive to red rays.

I denominated these bodies which sensitize silver salt in the aforesaid manner, optical sensitizers, and I and others after me have discovered a large number of such optical sensitizers amongst the dyes, and in this manner the so-called isochromatic gelatine plates, coloured with an optical sensitizer such as cyanine, chinoline red, eosine, erythrosine, are now articles of commerce.

All these isochromatic gelatine plates are generally less sensitive than ordinary plates, and require a yellow glass plate interposed between the lens and the sensitive plate for diminishing the power of the blue light.

By this interposition of a yellow plate the time of exposure was lengthened, and if the surface of the plate was not quite even, the sharpness of the photograph was lost, so that these isochromatic plates are used on a small scale only for the reproduction of pictures or paintings, but not for portrait or landscape photography.

Now I have succeeded in making isochromatic gelatine plates, the sensitiveness of which is twice as great as that of the ordinary gelatine plates, and which do not require any yellow plate or screen.

This discovery is based—

1. On the application of the eosides of silver, that is, the chemical combinations of eosine dyes with silver. These eosine dyes or derivatives of fluoresceine are all acids, and combine with silver salts.

2. On the addition of silver salts to other optical sensitizers, for increasing their sensitizing power.

As early as 1884 I observed this favourable influence of the presence of silver salts, and proved, for instance, that eoside of silver will give ten times more sensitiveness for yellow light than ordinary eosine, but I have only now succeeded in making plates without fog or film and spots, so that I can introduce the process into practice, and I have proved that it is possible to produce in this manner landscapes and portraits far superior to those taken with ordinary plates.

I have now invented the following methods for making highly sensitive isochromatic plates or sensitizing solutions, so that any photographer or amateur can prepare his own isochromatic plates.

In order to attain this object I proceed as follows:—

1.—Ordinary gelatine plates are bathed in a solution of a soluble salt of silver (1 : 1000), then in a solution of an eosine dye, or a mixture of eosine dyes, or a mixture of an eosine dye with other optical sensitizers, with or without liquor of ammonia. The solution of the dye can also be used first and the silver solution afterwards, or an emulsion can be mixed with a soluble salt of silver and the dye added to the mixture, or *vice versa*, and with or without ammonia.

2.—A silver eoside is formed by mixing a solution of an eosine dye, or a mixture of different eosine dyes (for instance, ordinary eosine, blue tinted eosine, chrysoline, aureosine, phloxine, Bengal rose, or any other derivative of fluoresceine), with a soluble salt of silver, such as sulphate, nitrate, acetate, or fluoride of silver.

This eoside of silver can be collected as a precipitate, washed and mixed with the emulsion, or dissolved in diluted ammonia or diluted acetic acid, and employed as a bath for soaking dry



plates; but I prefer to add liquid ammonia, carbonate of ammonia, or acetic acid, during the process of precipitation, so that the suspended precipitate is dissolved, and to employ the same as sensitizing agent for fluid emulsions, or the said solution can be diluted with water and used as a bath for dry plates. The quantity of this solution of eoside of silver to be employed varies according to the quality and kind of emulsion treated with the same, although the following formula will serve as a general guide for those employing my sensitizing solution:—50 c.c. of a solution of an eosine dye, 1 part dye to 1,000 parts water or diluted alcohol; 1 c.c. of a solution of nitrate of silver, 1 part nitrate of silver to 20 parts of water; 1 to 2 c.c. of liquor of ammonia.

The solution is either mixed with the emulsion, that is, 5 to 10 per cent. is added to the emulsion, or the same is diluted with 200 to 500 cubic centimeters water, and the gelatine plates immersed or soaked in the same for about one minute, and then dried.

3.—I furthermore use other dyes, known as optical sensitizers, which do not chemically combine with silver, but the sensitiveness of which is much improved by the presence of a soluble salt of silver, such, for instance, as cyanine, chinoline red, coruline, &c., and mix them with any soluble salt of silver. I employ, for instance; 50 cubic centimeters chinoline red, or a mixture of chinoline red and cyanine (solution 1: 1000); 1, 5 to 3 cubic centimeters nitrate of silver (solution, 1: 20); 15 cubic centimeters ammonia liquor.

This solution is employed in the same manner as the eoside of silver solution described under 2.

I furthermore employ the solutions described under 2 and 3, in varying proportion, for improving the sensitiveness for any part of the chromatic spectrum.

4.—I likewise employ, in like manner as mentioned under 1, 2, 3, the salts of lead which produce, when mixed with an eosine dye, eoside of lead, which said salts can be employed alone or mixed with eoside of silver.

I furthermore employ the insoluble salts of silver, such as the chlorides, tartrates, citrates, &c., dissolved in ammonia or acid.

I do not confine myself to any of the proportions of the mixtures as given in the foregoing specification, as the same can be varied according to requirement, without in any way departing from the nature of my invention.

I do not claim broadly the use of eosine applied with alkali as its solvent and vehicle on the dry layer of a prepared plate; nor do I claim the use of such a solution poured into an emulsion of gelatine-bromide of silver at the moment of its formation.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1.—The application and employment of the chemical combinations of silver or lead, with an eosine dye or eosine dyes, for producing highly sensitive isochromatic emulsion or gelatine plates, substantially as and for the purpose set forth in the foregoing specification.

2.—The application and employment of dyes, known as optical sensitizers, in combination with the salts of silver, substantially as and for the purpose set forth in the foregoing specification.

## Correspondence.

### PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

SIR,—Will you kindly permit me to remind intending exhibitors at the Masonic Hall, Birmingham, on the occasion of the Convention Meeting to be held July 23rd, that the Exhibition Committee will very shortly proceed to allot the space. As this space is limited, early application is requested; applications will not be received after June 23rd.—We are, sir, yours faithfully,

JOHN COLLIER, Chairman.

STEPHEN J. HOLLIDAY, Hon. Sec. Exhibition Committee.  
32, Imperial Chambers, B., Colmore Row, Birmingham.

### A PHOTOGRAPHIC CLUB FOR THE NORTH WEST DISTRICT.

DEAR SIR,—Will you allow me to intrude on your valuable space in order to inform the photographers of the

N.W. district that there is a club being formed for Kilburn and the surrounding neighbourhood?

The next meeting will take place on Wednesday, the 20th inst., at 8.30 p.m., at the above address. The subscription has been fixed at 10s. per annum; but, until the club is established on a firm basis, there will be no call made on members. They will, therefore, run no risks. I shall continue to give the use of my rooms whilst the club is in embryo. Hoping to see a goodly muster, yours faithfully,

H. C. BRAUN.

1, Kilburn Square, London, W.C., June 12th, 1888.

## Proceedings of Societies.

### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

The usual monthly meeting of this Society took place on Tuesday evening last, the 12th inst., the President, J. GLAISHER, F.R.S., in the chair.

The minutes of the previous meeting having been read and confirmed, Sir DAVID L. SALOMONS was called upon to read his paper, "Note on Depth of Focus," which, however, was in great part taken as read. The number of mathematical formulæ with which it bristled gave it a very learned appearance, and on its conclusion the President invited remarks from

Capt. ABNEY, who said that he was pleased to see mathematical subjects taken up; there was too little of mathematics generally, and some of the formulæ, he thought, would prove practically useful.

T. SEBASTIAN DAVIS said that depth of focus, as generally understood, was not the distance at which objects were separated that had to be photographed, but the amount of play which the focussing screen might have without losing definition.

W. E. DEBENHAM admired mathematical formula, when requisite and based upon accurate and definite grounds. In the present instance the base taken was that a circle of confusion of  $\frac{1}{150}$  of an inch was permissible. Now for some subjects, and for photographs of small size, that was too large an amount of confusion, whilst for life-size heads a much larger circle of confusion was both permissible and inevitable—as large, indeed, as would result from enlarging a good small negative up to life-size. With regard to Mr. Davis's observation, the amount of depth of focus at the two places—the field and the camera—was reciprocal.

Capt. ABNEY said that in photographing stars, circles of confusion of  $\frac{1}{150}$  of an inch were too large. A star in the centre of the field might appear with a circular disc, but towards the margin these circles became ellipses, and sometimes even rings.

LYONEL CLARK remarked that in France and Belgium the tenth of a millimetre, or about  $\frac{1}{250}$  of an inch, was recognised as the permissible amount of confusion.

Sir D. SALOMONS said that the reason for measuring the depth of focus in the object, instead of in the camera as proposed by Mr. Davis, was that in the former case the quantity was so much larger. If the camera measure were to be taken, they would have to go into very small quantities. He had assumed flatness of field in the lens. If the field were curved, the discs of confusion, where out of focus towards the margin, would be ellipses instead of circles.

Capt. ABNEY then read a paper on "Platinum Deposits." He had, he said, examined the question of the relative amount of deposit in platinum printing as affected by hot or cold development, with the aid of a photometer constructed on Spurge's model, and of an apparatus, which he exhibited and explained, for comparing the depth of tints. This apparatus consisted of a box which contained a tinted paper in close contiguity with a white surface. A paraffin lamp and a reflector served as sources of light, one of which cast the shadow of a rod upon the plain paper, and the other upon the tinted portion. A revolving disc, with movable sectors, when set in motion, partially obscured the light falling upon the white surface, and by adjusting the sectors until the light appeared equal upon the two shadows, and then reading off the position of the sectors, the amount of light thus cut off would show the amount of deposit upon the tinted portion. It has been found that this arrangement allowed an estimate to be formed, accurate within one per cent. The particular result that he had arrived at was, that with cold developer there was greater contrast for a negative of a certain amount of gradation, and that, therefore, as had been stated, cold development was best for thin negatives.



With hot developer, 200° Fahr., he had found that if, instead of the usual 130 grain to the ounce strength, a solution of half that strength was employed, there was no material difference in the result, but with a cold developer there was a very great difference.

W. E. DEBENHAM said that the publication of such strictly scientific methods of investigation was a distinct gain to science.

H. BERKELEY said that the Platinotype Company had some time since arrived at the same conclusion with regard to cold development that Capt. Abney had now come to in another way.

After a few words in reply from Capt. Abney.

The PRESIDENT, in proposing the vote of thanks, thought it noteworthy that observations could be made so exact as to admit an inaccuracy of only one per cent., and the meeting then adjourned.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The usual weekly meeting was held on the 7th inst., A. HADDON presiding.

T. KERR exhibited his detective camera. One of the special features of this camera is the way by which the plates are brought into position for exposure. The receptacle for the plates is filled at the bottom of the camera, the plates being kept in position by a spiral spring at the back of the box containing them. Two levers, inside the camera, raise the plates after exposure to a box fixed over the one containing the unexposed plates. The levers are raised or depressed by a small knob at the side of the camera working in a slot. The exhibit carried 18  $\frac{1}{4}$ -plates, but could be constructed to carry more if required.

W. T. WILKINSON then read a paper on "Photolithography" (see page 380), giving also a practical demonstration of the process. For this purpose he brought with him to the meeting several sheets of transfer paper that had been exposed under negatives of line subjects. These were developed, rolled up with transfer ink, and transferred to a prepared litho stone. Several copies were afterwards printed from this stone.

Some excellent litho. prints were distributed by W. ENGLAND.

The next demonstration by W. T. Wilkinson will be given on the 21st inst.; "Printing from Half-Tone Negatives" will then form the subject.

#### NORTH LONDON PHOTOGRAPHIC SOCIETY.

An ordinary meeting was held at Myddelton Hall on Tuesday, June 5th, J. TRAILL TAYLOR in the chair.

A letter from C. Clarke, 157A, Graham Road, Dalston, offering the use of his studio dark room to members, was read, and a hearty vote of thanks accorded to the writer.

F. LEWELLEN was elected as a member of the Society.

The PRESIDENT and E. CLIFTON exhibited "detective" pictures taken on board the *Alexandra* on the previous Saturday, the latter gentleman also showing the camera he had used. It was simply a quarter-plate instantograph packed in brown paper, a small book loosely tied on serving to hide the shutter, except at the moment of exposure.

F. W. HART drew and explained a diagram of a shutter suitable for detective work, made by him in 1859. It consisted of an endless band, with two circular holes in it, mounted on two rollers behind the lens; a suitably placed rubber band served to make the two holes rapidly pass each other; there was also an arrangement for taking up any looseness which might result from the stretching of the band with use.

A. C. EDWARDS exhibited a whole-plate detective camera invented by his father, B. J. Edwards. The camera and lens, which were of the ordinary type, were concealed in a Gladstone bag, a small door at one end allowing access to the lens. A roller blind shutter working immediately before the plate was used, a pneumatic release being operated from outside the bag.

L. MEDLAND asked whether in a drop shutter passing through the diaphragm slot, a circular aperture would not conduce to uneven illumination of the plate.

T. SAMUELS thought not, and exhibited prints taken with such an aperture in support of his theory. He thought uneven illumination in detective pictures usually resulted from some defect in the construction of the camera, such as placing the shutter too far in front of the lens.

The PRESIDENT said that the marginal rays were necessarily more oblique and attenuated than the axial ones.

Mr. CLIFTON drew attention to the fact that doublet lenses working at full aperture were usually employed for detective work, and that under such circumstances uneven illumination was to be expected.

W. BISHOP said that he thought that in cases of very rapid exposure, when the plate had received the minimum of light, this defect would be more apparent than when a full exposure had been given. In the latter case the edges had received a fair exposure, and "caught up" to the rest of the picture during development.

The optical lantern was then brought into requisition, and T. E. Freshwater exhibited a fine collection of transparencies, illustrating life in the Solomon Isles, Japan, Burmah, &c. The President showed some transparencies of views in Florida; and W. Bishop, slides from negatives taken with his detective camera.

The subject for discussion on June 19 will be "Rapid Shutters." Members and friends are requested to bring specimens.

#### LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting was held on May 31st, at the Royal Institution, B. J. SAYCE in the chair.

H. H. ROBINSON and J. S. WRIGHT were elected members.

The PRESIDENT stated that since last meeting, when Dr. Kenyon read a paper on "Hydroquinone Development," he had tested it in comparison with pyrogallie acid, and he had brought two negatives to illustrate the comparison. These had received a minimum shutter exposure under very unfavourable circumstances, and he would hand them round for inspection by the members. That which was developed with hydroquinone had not been forced at all, yet was full of detail even in the deepest shadows. Only one mixture of the developer had been employed, and its powers were not exhausted when the work was done. The pyro negative, on the contrary, required four relays of the developer, and, when the utmost definition possible had been got out, the plate was covered with yellow fog. Purposely, neither negative was cleared; had the pyro negative been cleared, the result would have been extreme hardness. The hydroquinone negative could have borne much more prolonged development, and, if so treated, would have remained free from hardness, but would give a vigorous print. In the published report of Dr. Kenyon's paper he noticed that the proportions given were five drachms each of A and B solutions, with half a drachm of C; but he had found that the better developer was when using the half drachm of C with only half an ounce each of A and B. This was the proportion given by Dr. Kenyon verbally. Though the cost of the hydroquinone was greater than pyro at present, there was economy in its use, for the mixed developer might be used several times. The colour of the image was a beautiful purple-black, and if development be continued until a pale grey veiling is shown on the dried negative, the prints will be brilliant without hardness. Experimenters will find that on drying the negative the density, as compared with the wet collodion after fixing, will be greatly increased. One peculiarity of hydroquinone is the fact that every effect of exposure appears to be grasped by it, and will be accounted for if the developer be only allowed to operate long enough; it appears to be the "royal road" to automatic development, and will lessen the few difficulties of photography to the novice. In answer to some inquiries he gave Dr. Kenyon's formula, viz.:—

Solution A.—Sulphite of soda...	2½ ounces
Boiled water ...	16 "
Solution B.—Crystal carbonate of soda...	¼ pound
Water (boiled) ...	20 ounces
Solution C.—Hydroquinone ...	1 drachm
Rectified spirit of wine ...	2½ ounces

Take half an ounce each of A and B, and add half a drachm of C. If over-exposure occurs, add to this quantity, say, two or three drops of the restrainer D, consisting of bromide of ammonium, 200 grains; water, 2 ounces.

Dr. G. A. KENYON stated that his verbal statement of the proportions of A, B, and C, was the correct one to follow.

F. EVANS had used hydroquinone developer only for some months, and was very satisfied with it; but he mixed it with the sulphite of soda solution, adding to each ounce of liquid about one grain of citric acid, and he found the solution unimpaired after several months.

A. W. BEER had used hydroquinone six years ago, and only abandoned it because of its slowness in acting, otherwise he was satisfied with it.

GEORGE H. RUTTER amused the meeting by mentioning that during the course of development he had gone away, read a few pages of a book, come back, looked at the progress, and con-



tinued reading, and coming on later found the image developed.

Dr. KENTON found in most instances that the image appeared in about one and a half minutes.

#### EDINBURGH PHOTOGRAPHIC SOCIETY.

THE eighth meeting of the current session was held in the Professional Hall, 20, George Street, on Wednesday evening, June 6th, at 8 o'clock, J. M. TURNBULL in the chair.

The minutes of last ordinary meeting having been read and confirmed, one gentleman was nominated for election in October, when the meetings resume.

A paper by Dr. Thomas W. Drinkwater, F.C.S., was read in his unavoidable absence by H. Brebner, entitled "Some Notes on the Latent Image," in which the theory of electrical action was advanced as the agent immediately concerned in the formation of the latent image. The paper was followed by an interesting discussion, in which the claims of the writer to originality were in great measure admitted, and opinions were freely expressed favourable to the conclusions advanced.

Mr. BREBNER said he had been engaged in various experiments and researches bearing upon the question of the electric formation of the latent image extending over the last five years, and he therefore took an unusual interest in the subject, and looked for the ultimate solution of the matter in that direction.

#### SHEFFIELD CAMERA CLUB.

THE opening meeting of this Society was held at 8, Fitzalan Square, on Friday, June 1st. There was a large attendance of members and friends, G. E. MALKHAM in the chair.

After the formal business, the President, Dr. Morton, delivered a lecture entitled "Reminiscences of a Trip to the East." The lecturer gave a graphic account of a voyage to India and the Burmese coast, undertaken by him during the autumn of 1882. He gave a description of the different ports touched at, including an account of the habits and customs of the Burmese.

Photographic transparencies, illustrating the lecture, were ably projected on the screen by B. W. Winder.

#### SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of the above Society was held in the Masonic Hall on Tuesday, the 5th inst. The President (T. Firth) was in the chair, and there was a large attendance. The presentation of the auditor's report was the first business, this being in consequence of the resignation of the late treasurer (C. Yeomans). The report was adopted, and E. Nowill was appointed treasurer in the place of Mr. Yeomans. Ernest Beck was elected honorary secretary, J. W. Charlesworth having resigned. Arrangements were made for an excursion by the Society to Bolton Abbey on the 14th inst. For the competition on the subject "Spring," some beautiful photographs were shown, and the prize was awarded to T. G. Hibbert, for a fine whole-plate picture of a warm rich tone.

"Shutters" was the subject arranged for next month's discussion. The president's offer of a prize for competition at the Bolton excursion was cordially accepted, and a vote of thanks accorded to him. Papers and demonstrations were promised at an early date on "Toning," by T. G. Hibbert; "Lens Stops and the Uniform System," by A. S. Platts; and "Enlargements," by E. Beck and J. W. Charlesworth.

### Talk in the Studio.

**INFLUENCE OF CERTAIN RAYS OF THE SOLAR SPECTRUM ON ROOT ABSORPTION AND ON THE GROWTH OF PLANTS.** By A. B. GRIFFITHS and MRS. GRIFFITHS (*Proc. Roy. Soc. Edin.*, 123, 125-129).—Mustard and bean plants grown in calcareous soil, to which have been added a definite amount of ferrous sulphate, were exposed daily to various portions of the solar spectrum. Incineration of the plants showed that the greatest amount of ferric oxide was contained in those exposed to the yellow-green rays D-E, under the influence of which rays also the greatest amount of oxygen is evolved. Examination of the plant for sulphur as representing the albuminoids, which must have derived their sulphur from the ferrous sulphate, showed that the maximum of albuminoids was attained under the influence of the rays from D to E.—*Journal of the Chemical Society.*

**TECHNICAL EXHIBITION AT THE BATH AND WEST OF ENGLAND SHOW, NEWPORT.**—In the recent Technical Exhibition at the Bath and West of England Show, held at Newport, Photo-

graphy, Lithography, and Printing occupied an important position. H. Dunning, of Usk, had an excellent collection of views and interiors; his 22 by 19 enlargement view of the Alexandra Docks, Newport, gained the 1st prize offered to professionals. The section for amateurs was well represented. Two 1st prizes were awarded, one to A. H. Townsend, for a bromide enlargement, 10 by 9, of a Moat and Tower; the other to W. Bush, for some fine specimens of photolithography and silver prints of line drawings in black and white; his photographic copy, the front page of *Ally Sloper's Half Holiday* (the "Winning of the Derby") reduced to about 3 inches in length, attracted considerable attention, the visitors viewing it through a strong magnifying glass. The 2nd prize was awarded to J. S. Kerslake, for some very artistic views. The Rev. Archdeacon Bruce exhibited some good work, consisting of enlargement of views of Welsh scenery, and Mr. Mitchell showed some fine silver prints. The 1st prize for Lithography was awarded to H. Bowden (Mullock and Sons), Newport; the 2nd prize to T. N. Lewis. The 1st prize for Letter-Press Printing, to J. Troakes (Christophers and Son), Newport; and the 2nd prize to P. Dowland (Mullock and Son), Newport. In addition to the above, there were numerous other exhibits, consisting of paintings by local artists, engraving, bookbinding, and examples of industrial art, wood carving, fretwork, mechanical models, and fancy work in textile fabrics. The prizes were adjudicated by H. M. Cundall, of the South Kensington Museum. The Mayor of Newport (Thomas Pugsley) subscribed liberally to the Prize Fund. The result has been a great success. On Saturday the 9th, although the weather was very unfavourable, the visitors came in one continuous stream; over 15,000 entered the grounds, most of whom patronized the Technical Exhibition, which was throughout the day the most crowded spot in the show.

**PHOTOGRAPHIC CLUB.**—The subject for discussion on June 20th will be "Photo-Mechanical Printing Processes." Saturday outing at Bromley, Kent.

### To Correspondents.

**SURPRISED.**—1. As a matter of fact, we know of cases in which gelatino-bromide prints which were made as long as twelve years ago (*i.e.*, soon after the process was introduced) show no signs of fading; but as against this we have a host of cases in which such prints have faded in weeks or months. 2. As a matter of fact, thorough washing is desirable, although—as in the case of prints on albumenized paper—it has not been established that in every case imperfect washing and rapid fading have been associated. 3. If, in the face of existing knowledge, you sell such prints as "permanent," you well deserve to be prosecuted for obtaining money under false pretences.

**M. E.**—Take care that the metal is free from all traces of greasy matter, and float the film off in a warm solution of gelatine one part in water thirty parts. Then catch the film on the plate and set up to drain.

**STUDIO.**—1. We have found that a wash with white of egg diluted with its own bulk of water, well beaten, and then filtered, answers better than any varnish we have tried. 2. The particular arrangement you refer to has so far gone out of fashion that no one is in the habit of making them for photographers; but we take it that anyone in the habit of making collodion transfers would undertake them.

**BROAD ARROW.**—1. It should be 100 volumes as stated, but the micro mixture of alcohol and ether will answer very well. 2. As far as we know, there is not any patent that will interfere with any part of the process as described in the place referred to. 3. The patent is still in force. Write to the Autotype Company, 74, New Oxford Street.

**W. W.**—We will write to you.

**A. E. D.**—1. Stir two ounces with a pint of water, and filter. The addition after filtration of sixty or a hundred drops of hydrochloric acid will make it far more active. 2. The hydrochinone developer will probably suit you.

**W. F. MORRIS.**—A lens of the same maker, having an equivalent focus of 4½ inches. 2. Your letter has been handed over to the publishers, within whose department the second item comes; there is, however, necessarily delay when communications as to business matters are sent to the wrong quarter.

**PARIS.**—The pay for such work as yours averages less in Paris than in London, and there is less chance of getting work over there. In addition, we may say that the consumers are more critical as to quality.

**C. A. M. W.**—We know nothing of the firm, but if you send full particulars to the Chief Constable of Birmingham, doubtless the matter will be investigated promptly.



# THE PHOTOGRAPHIC NEWS.

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### CHLOROPHYL FOR ISOCHROMATISING GELATINO-BROMIDE PLATES.

At a recent meeting of the Franklin Institute of Philadelphia, an interesting communication by Fred. E. Ives was read, in which Mr. Ives points out how his process of isochromatising with chlorophyl, the colouring matter of green leaves, can be successfully applied to the gelatino-bromide process. Mr. Ives says:—

The isochromatic processes now most used are incapable of producing correct monochrome photographs of objects in all colours; eosine and erythrosin plates are insensitive to red, and even cyanine plates will not show any difference between a black and a deep red without greatly over-exposing orange and yellow. The original process (collodion emulsion with chlorophyl) is the only one yet published which has not this defect.

But most photographers do not like to use this process, because suitable chlorophyl cannot be procured at all times, nor preserved without considerable loss of sensitiveness; and the plates must be prepared immediately before use, and exposed wet in a strong light. Many who have seen the beautiful results obtained with this process have lamented the fact that chlorophyl could not be applied successfully in the gelatine plate process, and I tried many times to accomplish it. On several occasions I obtained considerable colour-sensitiveness, but the result was so uncertain as to be puzzling and discouraging. At last, however, I have succeeded in securing, by a surprisingly simple procedure, the full action of chlorophyl upon commercial gelatine bromide plates.

The degree of colour-sensitiveness obtained appears to bear a definite relation to the general sensitiveness of the plate employed, which should, therefore, be of the most rapid kind. They are prepared by flowing with the alcoholic solution of chlorophyl, then drying rapidly, then soaking in water for at least five minutes, after which they may be used at once. With two-year-old chlorophyl (obtained from suitable leaves, at the proper season, and preserved with zinc powder in the solution), the absolute colour-sensitiveness is fully equal to that of commercial "orthochromatic" plates, and is so distributed as to be capable of giving far more accurate results; but the blue-sensitiveness, which is reduced by cyanine and erythrosine, is actually increased by chlorophyl, making it necessary to use an extra deep orange colour-screen with these plates. This excessive blue-sensitiveness is, in fact, something of an objection to the plates, because it is not easy to get a colour-screen that cuts off just the right amount of blue light. With screen and exposure that would be exactly right for the commercial "orthochromatic" plate, the chlorophyl plate would be far over-exposed, with five or ten times too much action in the blue and violet. But if the colour screen is deep enough, the resulting negative is perfect for all colours.

For purposes of comparison, I have made one photograph of the solar spectrum on a very rapid gelatine-bromide plate treated with chlorophyl, and another on a commercial "orthochromatic" plate. A yellow screen was used to reduce the action at the violet end of the spectrum, and both plates received the same exposure. The total amount of action below the Fraunhofer line *E* is about the same in both plates, but in the commercial "orthochromatic" it is mostly confined to the yellow, while in the chlorophyl plate it is pretty evenly distributed throughout the yellow-green, yellow, orange and red, down to the Fraunhofer line *a*.

In view of the fact that chlorophyl has been tried with gelatine-bromide plates a great many times, and in various ways, without definite success, the most surprising thing about this method is its simplicity.

Since obtaining these results, I have read a very interesting paper by Capt. Abney, in which he calls attention to the fact that cyanine and erythrosine will impart colour-sensitiveness to a commercial gelatine-bromide plate when merely applied to the surface, as by flowing the plate with collodion or varnish in which a little of the dye is dissolved. He concludes that contact of the dye with the surface molecules of bromide of silver in the plate is all that is required to secure colour-sensitiveness, and suggests that chlorophyl should therefore succeed with gelatine-bromide plates if merely applied in that way, or in alcoholic solution. It will not; the subsequent soaking in water is essential to the production of colour-sensitiveness.

The discovery that chlorophyl would act so well when applied in the above-described manner, suggested the idea of trying other colour-sensitizers in the same way. Plates were therefore prepared with erythrosine, by flowing with alcoholic solution containing one-fourth of a grain to an ounce, then drying, then washing or soaking in water. The result was a great surprise. Although not a trace of ammonia or silver were used, the plates showed several times more absolute colour-sensitiveness than the dried chlorophyl plates (but all in the yellow and green), and about ten times more than the commercial orthochromatic plates. They work clear and brilliant, and are sensitive enough for portrait work with the yellow screen.

Cyanine was then tried in the same way, and gave even more remarkable results than erythrosine. Without reducing the blue sensitiveness in the least, it made an extra rapid plate as sensitive to the orange-red, orange and yellow of the spectrum as to the blue, and as sensitive to the green as to the violet. The absolute colour-sensitiveness is many times greater than was ever before produced by cyanine, and ten times greater than has been produced by chlorophyl. The first plates that were prepared in this way gave only a mass of fog; the successful plates were washed and developed in total darkness,



One very important fact, discovered in the course of these experiments, is that the action of the dyes, by whatever method applied, is at least three times greater on some commercial plates than on others. The best plates I know of, have a full allowance of bromide of silver, in a very thin film of gelatine.

## CHAPTERS IN ELEMENTARY PHOTOGRAPHY— A GUIDE TO BEGINNERS.

BY W. M. ASHMAN.

### FIRST ARTICLE.

ALL authorities agree that the art of producing photographs grows apace. So familiar has this expressed opinion become, that one may be, to an extent, pardoned for imagining almost everybody possessed of taste owning a photographic outfit of some pretensions at no distant date, and that if picture making by photography has not hitherto been in its infancy, the impetus which the present high pressure rate of apparatus manufacturing is likely to give to out-door photography renders it possible for the present era to far outstrip any former period, and become the most prolific in the picture-producing line which the world has yet experienced. Camera constructors are nowadays no longer the sole retailers of their own wares as formerly. The growth of this industry has been so enormous, that the work of explaining mechanisms or other details intelligibly to purchasers has become in many instances relegated to the ordinary shopkeeper. Thus it is that tools, which are capable of producing satisfactory results when employed with skill, are familiar objects to be found in the shop windows of many traders whose avocations and wares differ widely.

The optician and the druggist each claim so much of the photo. stock dealer's business as properly belonging to their own domain, and large numbers of such shops exhibit the goods in question. The stationer, the draper, those who deal in artist materials, cycling machines, toys, and novelties, alike regard the exhibition of photographic outfits as an indispensable attraction to their general display. In some large towns, this branch of trade forms the leading feature in the business of the establishment. As a general rule, there is some information given to the customer as to the method of setting up the camera, tripod, and other paraphernalia, so that little difficulty need be met with when selecting apparatus with which to start in the practice of photography, for



Fig. 1.

prices range from a few shillings to many pounds, according to size, quality, and reputation of the makers. The least expensive set capable of producing a picture is retailed at the sum of three shillings and sixpence; it is but a toy, still it serves to teach an elementary lesson of no inconsiderable value to the learner. To J. B. Porta, the Italian philosopher, who lived in the second half of the 16th century, history teaches us we are indebted for the discovery of the camera-obscura. This clever experimentalist found that by admitting light through a small aperture in the window shutter of an otherwise perfectly

dark chamber, he was enabled to trace a reflected image on the opposite wall of the apartment, coinciding with the view presented to his gaze when the shutter was not closed (see fig. 1). But the image was reversed; therefore, to obviate this seeming difficulty, Porta fixed a convex lens in the small hole in the shutter, and by adjusting a mirror at the proper focus, succeeded in showing a

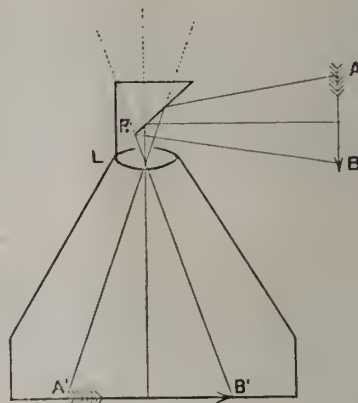


Fig. 2.

picture—as ordinarily viewed in nature—unreversed, upon a light screen, as in fig. 2.

Soon the practical value of such an unexpected and remarkable invention became known to Porta's friends, and it is reported that Canaletto, a celebrated Venetian painter, produced, by the means thus afforded him, an excellent series of pictures representing Venice. As there is a striking similarity between the principles involved in the penny toy sold in the street gutters, which enables two persons to hold converse when situated at a distance from each other by means of a length of string used for the transmission of sound, and the more pretentious arrangements designed for efficient telephonic communication between persons situated hundreds of miles apart, so does the crude modification of Porta's dark-room, the pill-box, or other form of pinhole camera, enable a photographic result of scientific interest to be obtained, although of less practical utility than we are able to produce with the more perfect apparatus available—perfect in so far as size of resulting picture is concerned, and also in rapidity of production, but not in quality. Joseph Zentmayer, an authority on lenses, writes:—"The pinhole camera is free from all the errors as spherical and chromatic aberrations, distortion, curvature of field, astigmatism, and the only objection against it is the extremely small aperture. What an amount of speculation and hard labour of the most eminent men were necessary to furnish a substitute, equally free from errors, having a larger aperture, giving a brighter image. And, even now, none of the aberrations can be completely corrected, and the best that can be done, and that for a limited aperture only is to reduce the errors so far as to diminish their extension, so as to make them appear to our eye at a smaller angle than the eye is able to distinguish."—(*Wilson's Quarterly Century of Photography*.)

Defects in lenses will be treated in another chapter. Before quitting the subject of inexpensive apparatus, a word or two concerning the pill-box form of camera may be useful. The instrument shown in Fig. 3 is an illustration of a metallic box less than an inch deep, blackened. Over a hole pierced in the lid is fixed a piece of stout foil, by means of varnish. A fine needle-point pressed through the metal, but not beyond, is sufficient to make an aperture one-sixtieth of an inch in diameter. At the bottom of the box a circular bromide plate or disc of bromide negative paper should be in the dark-room adjusted by means of wax, the lid fixed down,



and the box secured from actinic light until required. An exposure of four to five minutes upon an object ten feet distant, and well illuminated out of doors, should enable a good negative to be developed, provided that no vibration



Fig. 3.

has taken place during exposure to blur the image. When used indoors the exposure has to be very much prolonged, twenty to thirty minutes or more being often necessary to secure a developable negative worth printing.

### INSTANTANEOUS STUDIES.

NO. 16.—MATHEMATICS AT THE PHOTOGRAPHIC SOCIETY. (A forecast of what may happen if the present taste for mathematics continues.)

*Photographer (to sitter).* I beg your pardon, but I must ask you to wait while I calculate what lens I shall use.

*Sitter.* Oh, certainly. I suppose you won't be very long?

*Photographer.* Well, the fractions are rather complicated, but I won't be longer than I can help. (*Sits down, and works away with pencil and paper for ten minutes.*)

*Sitter (getting impatient).* I'm afraid I must go soon, I have an appointment in half an hour's time.

*Photographer.* Very sorry, but I've got a confounded equation that won't come right. (*Walks up to sitter.*) Would you kindly move away for a moment, I generally work out my calculations on the black-board, saves all the bother of a black-board, you know. I think you wanted cartes, did you not?

*Sitter.* No, cabinets.

*Photographer.* Really! Then I must start again, I have been working out the figures for a carte sized photograph. (*Rapidly puts down a series of equations in the background, in the midst of which the chalk breaks.*) Excuse me one moment while I go for some fresh chalk. (*Exit.*)

[*Re-enter Photographer.*]

*Photographer.* So, sorry to keep you waiting. I'm glad to say I've discovered where my error was, so we can go to work at once.

*Sitter.* I'm very glad. I was getting rather tired.

*Photographer.* I shall not detain you long now. (*Puts down an equation on the background.*)

*Sitter.* I thought you said you had finished.

*Photographer (absorbed).*  $f$  plus  $f$  dash divided by  $x$  equals—

*Sitter (in a loud voice).* I think I had better call another day.

*Photographer (suddenly waking up).* I shall be at your service in two seconds. It is of the utmost importance I should calculate what stop to use.

*Sitter (ironically).* I'm afraid you won't get me to stop (*rises as if to go.*)

*Photographer.* It's all right now. It only remains to ascertain the exact exposure by means of the sensitometer, and then I think we may proceed. (*Calculates exposure, and then looks round for sitter.*) Bless me, no one is here!

[*Enter young lady from reception room.*]

*Photographer.* Has that gentleman gone who was here just now, Miss Smith?

*Miss Smith.* Yes, sir. He said he was not able to wait any longer. He may call again, but he is not certain.

*Photographer.* What a confounded nuisance! just as I had brought out my calculations quite right too.

(*Left doubting whether the rule-of-thumb does not pay better after all, than the rule-of-three.*)

### Review.

TYLAR'S DEAD BLACK VARNISH. Bottle in case, with brush, 1s. 6d. (*W. Tylar, 58, High Street, Aston New Town, Birmingham.*)

This is a varnish having oil of turpentine as a solvent; and lampblack in suspension. On trial, we find that it answers admirably for wood, metal, or leather, the principal advantage being that, unless put on far too thickly, it has no tendency to burnish bright when the surface is rubbed.

W. Tylar also sends us a sample of a printing-out emulsion which he prepares.

### PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

PLATINUM PRINTING WITHOUT DEVELOPMENT—NEY'S PATENTED MAGNESIUM LAMPS—EDER'S ORTHOCHROMATIC WET COLLODION PROCESS—TONING WITH OBERNETTER'S GELATINO-CHLORIDE EMULSION PAPER.

*Platinum Printing without Development.*—Captain Pizzighelli's new process of direct platinum printing has excited great interest in all countries, and it seems, indeed, to be destined to mark an era in the production of matt surface printing. For preparing the paper after the formula published, many operators failed, however, to obtain satisfactory results, though the manipulations are very simple and easy, and I still receive many letters and inquiries as to the coating of the paper, &c. To those it will be of interest to learn that the new paper for direct printing may now be procured ready prepared from Messrs. Adolf Heseke, Ph.D., and Jacoby, Ph.D., of Berlin, Landsbergerstrasse 32. I have myself made many experiments with this paper lately, and I am quite satisfied with the results. The process is really simplicity itself. The paper is printed under the negative until the image appears sufficiently intense (no longer), which requires considerably less time than in the case of albumen paper. Then the print is placed for five minutes each time in three baths of diluted hydrochloric acid (about 1:70 water), until the lights will appear perfectly white. Finally the print is washed out in water for about a quarter of an hour, when it is dried and mounted. No toning and no fixing bath is required, and half an hour after printing the paper, you will have the picture finished and mounted. Though before printing the paper should be kept dry, it wants a certain degree of dampness to make the picture appear directly during the printing process. The dampness required will either be absorbed by the paper itself from the atmosphere, or it must be produced in an artificial manner. This may be done either by breathing upon the paper, or by exposing it to the vapours of boiling water. As the simplest method, I have experienced the following one. The paper—with its yellowish, i.e., prepared surface—is laid on the negative, which should be neither thin nor flat, and the whole placed into the printing-frame. To see how far the printing process is advanced, open the frame from time to time, breathing always on the same half of the paper, that is to say, on the film side. The negative itself must always remain dry. When the half of the print which you have breathed upon



appears sufficiently dark, take the paper off the negative and breathe on the entire surface, or expose it to the vapours of hot water. The print is then at once placed into the acid bath. The mounted prints may very easily be retouched with Chinese ink. In the case of portraits, it is recommended to print them on white ground, that is to say, vignetted. Under-printed pictures may be continued to print by placing them in a cold solution of oxalate of soda or in a five per cent. solution of soda. The ready prepared paper is kept either in chloride of calcium tin plate envelopes, or simply in pasteboard covers. Two kinds are on stock: No. 1 for normal and the harder kinds of negatives, the pictures produced with it having a brownish tone; and No. 2 for somewhat softer negatives, the pictures produced on this kind showing the deepest shadows and the purest whites.

*O. Ney's Patented Magnesium Lamps.*—I have recently had the opportunity to see in the establishment of a well-known photographer, who was about to make an enlargement of an excellent portrait negative on Eastman paper, one of Mr. Ney's magnesium lamps at full work. I was told by the operator that this lamp proves very valuable for enlarging purposes, and that it worked always most

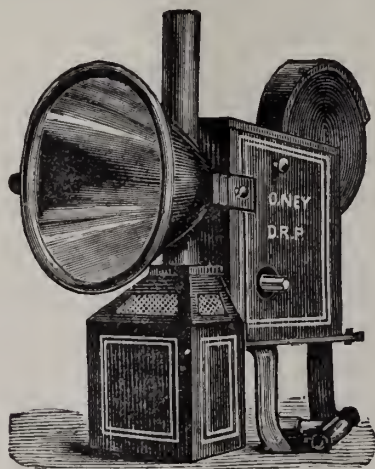


Fig. 1.

exactly. It is provided with a clockwork arrangement, and burns steadily for about two hours. The smoke is conducted by a tin pipe into the open air, whilst the consumed part of the magnesium wire, which otherwise would accumulate and be inconvenient, is led by a special arrange-

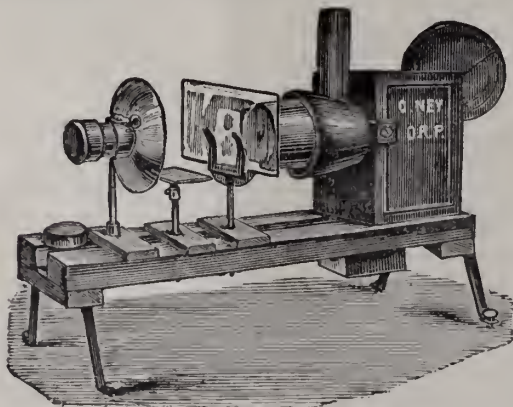


Fig. 2.

ment, and connected in a receptacle. Of the accompanying sketches, fig. 1 shows the magnesium lamp in its form as a source of light in portrait photography or in photo-

micrography. It is provided with either a polished or matt parabolic or spheric reflector, according to the purpose intended, or with combinations of lenses to concentrate the light to a fixed point. It burns steadily for at least an hour. Fig. 2 shows the lamp adapted to the sciopicon, in which form it offers many advantages compared with the paraffin lamp generally used for the exhibition of lantern slides. It gives a much more intensive and brilliant light, without developing any perceptible smell or heat. It burns constantly for about three hours, the intensity of light being that of about 150 standard candles. Finally, fig. 3 represents the enlarge-



Fig. 3.

ment apparatus already mentioned. The intensity of this light being always the same, it is possible, after a few experiments, to fix in advance the time of exposure required to obtain a good print at the very beginning. Any portrait lens or aplanatic lens may be used with the enlarging apparatus, provided that its focus is not less than six to eight inches. As to further information about these useful lamps, I must refer the readers to the manufacturer, Mr. O. Ney, of Berlin, Wilhelmstrasse 34.

*Eder's Orthochromatic Wet Collodion Process with Sensitizing Baths.*—In the last issue of the "Photographic Correspondenz" Professor Eder describes—besides the collodion emulsion process I described in my previous letter—an orthochromatic wet collodion process, which he has also established at the Photographic Teaching and Experimental Institute at Vienna, and which, as he says, gives most beautiful results. Moreover, it is quite certain, though its sensitiveness being about ten to twenty times lower than that of the said collodion emulsion, the exposure required varies between a few minutes and a quarter of an hour in the case of oil paintings. Also, by this process, the various colours are reproduced in their true values without a yellow screen being required. The process is the following:—Eosine collodion.—In 140 c.c. of alcohol (of 40°) 0.6 grammes of eosine (yellow stain), and 12 grammes of cadmium bromide, are dissolved and filtered, and 70 c.c. of this solution are mixed with 100 c.c. of 2 per cent. plain collodion. The glass plate is coated round the edges with india-rubber solution, then the collodion is poured on. After the first coating was settled, another coating of collodion should be applied, this time pouring it on at the opposite corner of the plate. The film having settled, the plate is sensitized in a strong silver bath. The first bath consists of 100 grammes of silver nitrate, 500 c.c. of water, and 2 to 3 drops of concentrated nitric acid. The plate is left in this bath for five to seven minutes, when it is immediately placed in another sensitizing bath consisting of 10 grains of silver nitrate and 500 c.c. of water, in which the plate is left for one to two minutes. In this way the nucleon first sensitizing bath, being left in the film, is washed away, the weak solution preventing that, in the case of longer exposures, the silver nitrate becomes dry and crystallizes. The exposure will take about five to eight times longer than the old wet



collodio-iodide process with the sulphate of iron developer. The developer consists of a solution of 10 grammes of iron sulphate in 100 c.c. of water, to which 2 to 4 drops of concentrated sulphuric acid are added. The picture comes out rapidly, and the development has to be carefully controlled. The negative is fixed with hypo, by which the picture, appearing somewhat flat at first, is rendered clear and brilliant. The reddish colour remaining in the film can be eliminated by application of diluted alcohol and rinsing with water. Intensification is effected with the well-known mixture of pyro, citric acid, and silver nitrate, reduction by potassium ferricyanide with hypo, or by bichloride of mercury with potassium cyanide.

**Toning Process with Obernetter's Gelatino-Chloride Emulsion Paper.**—In the same number of the *Correspondenz* Otto Hruza recommends the gold bath with chalk for toning Obernetter's gelatino-chloride emulsion paper, which has the advantage that it keeps better, and that it is cheaper than the toning solution recommended by Obernetter himself. The process is as follows:—The prints must be a little over-printed, still more than albumen prints, because they are considerably reduced in the fixing bath. They are placed with the film side upwards in the washing bath, and after having been washed out for five to ten minutes, they are taken out, and put into the toning solution. This consists of

Gold and sodium chloride	...	1 gramme
Distilled water	... ..	600 c.c.
Powdered chalk	... ..	50 grammes

One hour before use the gold solution is shaken up, then allowed to settle, and then filtered into the dish. It is then ready for use. After it has been employed, it is poured back into the stock solution bottle. In this bath the prints are left until the yellowish colour which by transmitted light may be seen in the light parts of the picture has disappeared, and a slightly reddish-violet colour appears in the half-tones. Then the prints are washed out for a short period, placed in the alum bath, washed out once more, and placed for fifteen minutes in the fixing solutions (1 : 20); in this bath the prints will lose their violet colour, and become reddish-brown, or brownish, according to the previous mode of toning. If the prints are then washed out and dried, that warm photographic tone will appear which, according to the duration of the action of the toning bath, will vary from brownish-violet to purple-and-grey. If a fresh, strong, gold solution is used, the toning will be completed within twenty to thirty seconds. In this manner fifty prints of the size of 11 by 15 inches can be toned with only 1 gramme of gold and sodium chloride without exhausting the gold bath. Comparative experiments have shown that in using the toning bath recommended by Obernetter, almost four times as much gold chloride is required to obtain the same colour tones, and that even the toning of albumen prints requires more gold chloride than this process. Prints which have been toned for too short a period, and which, therefore, have retained a brownish colour, may be toned further after fixing in the fixing bath itself, if a little red prussiate of potash is added to it until it turns yellow. After one to two minutes the print is taken out, washed out, placed into the alum bath, and then washed out. The alum bath consists of a cold saturated alum solution to which a little citric acid is added. As a rule, the prints will tone the quicker, the shorter they have before been washed out; on the other hand, the toning process can be better controlled if it proceeds slower; therefore, the mid-way will be the best. After a few experiments, it will be very easy to obtain the tone required by this method.

#### THEORETICAL CONSIDERATIONS IN EXPOSURES.

BY SIR DAVID L. SALOMONS, BART.\*

LET us first consider how the relation between the light on the object to that on the image may be expressed in terms of the

principal focus and shorter conjugate of a lens, such an expression being simple, and where image is smaller than the object, the smaller conjugate is within the camera, and this is the case we are considering.

Let  $I$  represent the image,  $O$  the object,  $f$  the principal focus,  $f''$  the longer conjugate, and  $f'$  the shorter conjugate. Then we know (1)  $\frac{I}{O} = \frac{f'^2}{f''^2}$ , also (2)  $\frac{1}{f} = \frac{1}{f''} + \frac{1}{f'}$ , hence

$$\frac{1}{f''} = \frac{f}{f' - f}. \text{ Substituting this value for } \frac{1}{f''} \text{ in (1) we get}$$

$$\frac{I}{O} = \frac{(f' - f)^2}{f^2}.$$

Therefore, if no loss of light occurs between object and image the relationship shown holds good.

We can now investigate the probable value of air absorption of light and its effects in the image; and it is here that depth of focus steps in.

We know that as the image is smaller so is its light more intense, and this makes up for the loss of light; but for this law we should not perceive the fixed stars. This means that the near and more distant objects from the lens are equally bright upon the screen. If no air absorption existed this would be the case. In practice on the earth, we find the more distant an object is from the eye the duller it appears, and the loss of light depends upon the state of the atmosphere, such as damp, smoky, or dusty air. We may thus assume that air absorption near the

earth is always greater than the relation  $\frac{f^2}{(f' - f)^2}$ , for were it even equal to this,  $\frac{I}{O} = \frac{(f' - f)^2}{f^2} \times \frac{f^2}{(f' - f)^2} = 1$ ,

that is no matter at what distance objects may be, they would not lose in brightness, but remain of the same brilliancy. This is true for moderate distances only, but after this the image loses in light, instead of the brilliancy remaining constant, as would be the case if absorption did not exist, and therefore this

value must be greater than  $\frac{f^2}{(f' - f)^2}$ . Artists and photo-

graphers use the expression "Atmosphere" in a truly scientific sense, although innocent of the truth they express.

It will be observed that any object moved along a line between the planes of depth of focus, where they are infinitely distant, do not appreciably alter their size in the image, so that but for air absorption there would be no way of appreciating distances between those objects which are sharp in the picture. I believe this matter has been so far completely overlooked; and, apart from the scientific aspect of the question, it has a great bearing on exposure, since the absorption of light in passing through the air renders landscape photography possible, and pleasing besides, because distances can be judged in the picture without the stereoscopic property of the eyes, which even is not of much avail for distant objects. Besides, but for air absorption, the light reflected from objects would be intense, and produce effects which we cannot imagine. In the studio, where distances are extremely small compared with views out of doors, air absorption plays no appreciable part, although photographers are aware that very small pictures taken with long focus lenses are wanting in brilliancy, and it is due to this fact.

One more point remains to be investigated. How much light reaches the image? Captain Abney gives a good proof to show

that the light upon the image varies as  $\frac{a^2}{f^2}$ , where  $a$  = diameter of aperture, and  $f$  = any focal length.

The following proof gives another value on its way, which may sometimes be useful:—

Let  $O$  = object,  $I$  = image,  $H$  = height of object,  $f'$  = the conjugate within the camera, and  $f$  = equivalent focal length of lens.

Then we have seen before—

$$\frac{I}{O} = \frac{(f' - f)^2}{f^2},$$

therefore, light on image, if none is lost, may be expressed by—

$$I = O \frac{(f' - f)^2}{f^2}, \text{ and since } O = \left(\frac{H}{2}\right)^2 \pi = \frac{H^2 \pi}{4},$$

where  $H$  = height of object by substitution  $I = \frac{H^2 \pi (f' - f)^2}{4 f^2}$ .



Now the light which actually falls on the image is as area of aperture, that is  $\frac{(\frac{a}{f})^2 \pi}{1}$ , substituting the value found

for I we get  $\frac{(\frac{a}{f})^2 \pi}{H^2 \pi (f' - f)^2} = \frac{a^2 f^2}{H^2 (f' - f)^2}$ , and this

expresses the actual amount of light received on the image, compared with that on the object.

When  $O = I$ , then  $f' = 2f$ , and  $\frac{a^2 f^2}{H^2 (f' - f)^2}$  becomes  $\frac{a^2}{H^2}$ .

But  $H^2$  varies as the size of the image, and the image also varies as  $f^2$ , hence  $\frac{a^2}{H^2}$  varies as  $\frac{a^2}{f^2}$ , and this proves the known relation between  $a$  and  $f$ .

As a supplement to this paper I give a convenient set of tables for enlarging by area value, which is the most convenient way in practice. The plan is a special one and simple to use. The figures have been carefully checked, so no errors are likely to be present. About 1,500 separate calculations have been made to form the tables. The usual linear tables are also added, arranged on the same system.

AREA ENLARGING TABLE.—To Enlarge from

To—	$3\frac{1}{4} \times 3\frac{1}{4}$		$4\frac{1}{4} \times 3\frac{1}{4}$		$5 \times 4$		$6\frac{1}{4} \times 4\frac{3}{4}$		$8\frac{1}{2} \times 6\frac{1}{2}$		$10 \times 8$		$12 \times 10$		$15 \times 12$	
	Lens to		Lens to		Lens to		Lens to		Lens to		Lens to		Lens to		Lens to	
	Easel	Neg.	Easel	Neg.	Easel	Neg.	Easel	Neg.	Easel	Neg.	Easel	Neg.	Easel	Neg.	Easel	Neg.
$3\frac{1}{4} \times 3\frac{1}{4}$	2	2														
$4\frac{1}{4} \times 3\frac{1}{4}$	2.1	1.9	2	2												
$5 \times 4$	2.4	1.71	2.1	1.9	2	2										
$6\frac{1}{4} \times 4\frac{3}{4}$	2.6	1.62	2.4	1.71	2.2	1.83	2	2								
$8\frac{1}{2} \times 6\frac{1}{2}$	3.3	1.43	3	1.5	2.7	1.59	2.3	1.77	2	2						
$10 \times 8$	3.7	1.37	3.4	1.41	3	1.5	2.6	1.62	2.2	1.83	2	2				
$12 \times 10$	4.3	1.3	3.9	1.34	3.5	1.4	3	1.5	2.5	1.66	2.2	1.83	2	2		
$15 \times 12$	5	1.25	4.6	1.28	4	1.33	3.5	1.4	2.8	1.55	2.5	1.66	2.2	1.83	2	2
$18 \times 16$	6.1	1.2	5.5	1.22	4.8	1.26	3.1	1.32	3.3	1.43	2.9	1.53	2.5	1.66	2.2	1.83
$20 \times 16$	6.4	1.18	5.8	1.21	5	1.25	4.3	1.3	3.5	1.4	3	1.5	2.7	1.59	2.3	1.77
$22 \times 18$	7	1.17	6.3	1.2	5.5	1.22	4.6	1.28	3.7	1.37	3.3	1.43	2.8	1.55	2.5	1.66
$24 \times 18$	7.1	1.16	6.6	1.18	5.7	1.21	4.8	1.26	3.8	1.35	3.4	1.41	2.9	1.53	2.6	1.62
$24 \times 20$	7.6	1.15	6.9	1.17	5.9	1.2	5	1.25	4	1.33	3.5	1.4	3	1.5	2.7	1.59
$26 \times 20$	7.9	1.14	7.1	1.16	6.1	1.19	5.2	1.24	4.1	1.32	3.6	1.38	3.1	1.43	2.8	1.55
$30 \times 24$	9.1	1.12	8.2	1.14	7	1.17	5.9	1.2	4.6	1.28	4	1.33	3.5	1.4	3	1.5
$36 \times 30$	10.8	1.1	9.8	1.11	8.4	1.13	7	1.17	5.5	1.22	4.5	1.28	4	1.33	3.5	1.4
$42 \times 36$	12.7	1.08	11.4	1.1	9.7	1.11	8.2	1.14	6.2	1.19	5.4	1.22	4.5	1.28	3.9	1.34

When the figures are found, multiply each distance by equivalent focal length of lens employed. Thus, if it is desired to enlarge from a  $\frac{1}{4}$ -plate negative to 12 by 10 with a lens having 10 inches equivalent focus, then the results from table give 3.9 and 1.34; multiply each by 10, and easel must be placed 39 inches from the lens, and negative to lens 13.4 inches.

TABLE FOR LINEAR ENLARGING.—Number of Times.

1	2	3	4	5	6	7	8	9	10	11	12
2—2	3—1 $\frac{1}{2}$	4—1 $\frac{1}{3}$	5—1 $\frac{1}{4}$	6—1 $\frac{1}{5}$	7—1 $\frac{1}{6}$	8—1 $\frac{1}{7}$	9—1 $\frac{1}{8}$	10—1 $\frac{1}{9}$	11—1 $\frac{1}{10}$	12—1 $\frac{1}{11}$	13—1 $\frac{1}{12}$

Multiply the above figures by equivalent focal length of lens used. Thus to enlarge 4 times with a lens of 6 inches focal length, the easel must be placed 24 inches from lens, and the negative  $7\frac{1}{4}$  inches from lens.

EQUIVALENT FOCAL LENGTHS OF DALLMEYER'S RAPID RECTILINEAR LENSES, in inches.

$4\frac{1}{4} \times 3\frac{1}{4}$	$5 \times 4$	$6 \times 5$	$8\frac{1}{2} \times 6\frac{1}{2}$	$10 \times 8$	$12 \times 10$	$13 \times 11$	$15 \times 12$	$18 \times 16$	$22 \times 20$	$25 \times 21$
4	6	8 $\frac{1}{4}$	11	13	16	17 $\frac{1}{2}$	19 $\frac{1}{2}$	24	30	33

EQUIVALENT FOCAL LENGTHS OF ROSS'S RAPID SYMMETRICAL LENSES, in inches.

$4 \times 3\frac{1}{4}$	$5 \times 4$	$6 \times 5$	$8 \times 5$	$8\frac{1}{2} \times 6\frac{1}{2}$	$9 \times 7$	$10 \times 8$	$12 \times 10$	$13 \times 11$	$15 \times 12$	$18 \times 16$	$22 \times 18$	$25 \times 22$
4 $\frac{1}{2}$	6	7 $\frac{1}{2}$	8 $\frac{1}{2}$	11	12	13	16	18	20	24	30	34

ENLARGEMENT FORMULAE.

$(n+1)f'$  is the distance of easel from the lens, and  $(\frac{1}{n}+1)f$

the distance of negative from lens.  $n$  = number of times enlarged, and  $f$  = equivalent focal length of lens employed. For area enlargement,  $n = \sqrt{\text{number of times area enlarged}}$ .

These formulæ are those of conjugate foci, and can therefore be used for problems involving these functions, and for direct enlarging.

## SOME NOTES ON THE NATURE OF THE LATENT IMAGE.

BY DR. THOS. W. DRINKWATER, F.C.S.\*  
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OUR knowledge in many things concerning photography is hidden, and we might, with some justice, apply the term "Latent" to other phenomena besides the hidden image.

I don't think that, as a body, we disobey the great command

\* A Communication to the Edinburgh Photographic Society.



regarding the worship of graven images, but we all, I am sure, feel some interest in the so-called latent one, and would be pleased to know a little more about its nature, and the conditions under which it is produced. The interest centred in this subject is shown by the numerous speculations as to its nature, which have from time to time been made, and the numerous theories which have been put forward as to the cause of its formation, but at present I fancy they only exist as theories. What we want is proof. I do not know that I can do more than theorise to-night, but I have been experimenting—not always with success—but still, I think my results warrant me in putting forward one other theory regarding the nature of this photographic puzzle.

In Captain Abney's book on photography he opens with an ingenious theory regarding the latent image, and ascribes a purely mechanical cause for its origin. His theory is that light waves of certain length set up oscillations in the molecules of solid matter forming the sensitive medium, and that there is a certain amount of synchronism in the oscillations of the wave lengths and the matter on which they act. This theory is ingenious, but somewhat vague, and it altogether fails to account for the various phenomena of development; indeed, Abney sees this himself, for he takes it for granted that these oscillations produce a change in the silver salts exposed to light, which become reduced to sub-salts (so-called) which sub-salts by the action of the developer are still further reduced to the metallic state. In the remaining portion of the book development is always explained on the assumption that the latent image has been produced by a chemical change. Now this theory regarding the chemical change is a very generally accepted one, and though I have never yet met with anybody who proved it, nor have I ever seen any mention of such proof in any of the numerous publications devoted to the art-science.

You are all aware of the supposed, and I might add, accepted nature of this change. The chloride, bromide, and iodide of silver are said to be reduced to sub-salts, giving off during the process, free chlorine, bromine, or iodine, according to the nature of the plate or film.

Now to my mind there are several arguments against such a phenomena being possible. In the first place, I have calculated that in a 1-1 plate of average quality there are about 2 grains of combined bromine. Now, if this chemical theory be correct, on exposing a plate half of this bromine should be set free. Now, has anyone ever detected the slightest trace of bromine or any other halogen in his camera after removing a dark slide? Neither bromine, iodine, or chlorine are substances that could escape notice, for besides their well-marked colour, they have an odour, and an odour that there is no disguising. Again, I do not think that anyone with any respect for his camera would care to expose it to the tender mercies of a free halogen. The brass work, leather work, screws, &c., would soon resent such treatment. Another proof, equally strong to my mind, against this chemical theory is, that the so-called sub-salts of silver—I mean, of course, the halogen sub-salts—are insoluble in hypo. Now, if anyone exposes a plate and then fixes it without developing, it fixes to clear glass. This is a fact, I am sure, known to all of you, and to photographers generally, and yet you will hear everyone talking of the latent image as consisting of sub-salts of silver, and explaining all the phenomena of development by the action of the developer on these imaginary compounds. Do not misunderstand me, I do not say these sub-salts do not exist, I am aware they do; in fact, I have prepared them myself, to aid me in my experiments; but what I firmly believe, and what I wish to prove to you is, that they do not exist on an exposed photographic plate. I will even go a little further, and say that practically the sub-salts are produced by the action of light, and are present at a certain stage in a silver print. You see, I draw a distinction between the action which produces a silver print, and one which produces, or in part produces, a glass negative. Again, all these sub-salts are coloured more or less of a violet colour. Has anyone ever seen anything like an approach to colour in an exposed plate before it has been developed?

Somewhat recently this chemical theory has been more fully worked out by Professor Carey Lea, and he has given us the results of an elaborate series of experiments conducted with all the care and forethought which we should expect from such a distinguished chemist. He has prepared a set of silver salts which he calls photo-salts. His paper you have all read, I am sure, and I need only refer to it generally. These photo-salts have no imaginary existence, they have been produced and

examined, and to a certain extent explain the varied phenomena of development; in fact, Carey Lea's theory fits in beautifully with our general practical experiences and explains on the first blush all the mysteries of the latent image; but its weak point—for it has a weak point, and a very weak point—to my mind is, that he has never yet proved the existence of any photo-salt on an exposed plate, nor do I think it possible that he can do so. The series of photo-salts are interesting in themselves, and in some future development of photographic science they may be of value, but at present there is nothing to show that they are produced in an exposed plate, or that they even play any part in the production of a latent image.

The fact of the matter is, gentlemen, that we know practically nothing about the matter. Our knowledge concerning the changes which take place in a plate during exposure is as hidden as the image itself. In discussing photographic matters we always talk about the sub-salts, &c., as if there were no doubt of their production, and back up our ignorance knowingly, but unthinkingly, with, to speak plainly, a scientific fib. Since I have been interested in the matter, I have had conversation with several photographers who are really interested in their work, and the general opinion is, that the sub-salt theory is good enough for practical purposes. It explains all the difficulties very nicely, and even if it is not an exact truth, it does not matter. Scientists may wish to know the nature of the latent image, but it is doubtful if it would be of any value to practical photography.

Now I differ altogether from this view. If scientists had not interested themselves in photography, and searched into the causes of all the marvellous changes which photographic science is capable of producing, where, I ask, would photographic art be at the present day? If we wish to advance photography, if we wish to improve our methods of manipulation, we must surely gain in the first place some knowledge of the cause of the various effects brought under our notice. So if we wish to understand thoroughly, and to have under more perfect control the varied mysteries of exposure and development, we must have some more definite knowledge than we at present possess of the nature of the latent image.

As the outcome of my experiments, I have formed a theory which may, or may not, be a correct one, but which I am going to give to you, asking your help to either break it down or build it up. I want the subject fairly argued out, I want my weak points assailed, as I assailed others; I don't say my theory is the correct one, and that all others are wrong—mine may be even weaker than any that have gone before—but I will admit that I think it as plausible. My experiments are far from complete. I am still engaged with the subject, and intend next session to again bore you with a second instalment of the subject. If any of you can give me suggestions as to experiments I shall be obliged. As I have gone along I have found one experiment suggest another, and the work has not been accomplished so readily as I at first imagined it would be.

Broadly speaking, I account for the productions of the latent image by electrical action, and now for my proofs.

Some months ago a paper was read at the Chemical Society of London on the electrical phenomena which took place on mixing pyrogallol and caustic potash solutions, and this immediately struck me as having some bearing on photography, seeing that this mixture could be used as a developer. If development were electrical and not chemical, then the change produced by light, which gave us something to develop, might be electrical also. My first experiments were treating the various developers in such a way as to ascertain whether similar phenomena were produced. Without detailing all my experiments, I may say that pyro with ammonia, carbonate of potash, and carbonate of soda, all give, in mixing, current electricity. I get most effect with potash, least with ammonia. Mixing oxalate of potash and sulphate of iron also gave me a similar result. Here, then, I proved to my satisfaction that electricity was produced during development. Of course, here I met with weak point number one; although electricity is produced during development, is it the cause, or is it merely a bye effect, for you must remember that electricity is the result of innumerable chemical reactions. I next tried to prove that electricity is produced at the moment of exposure, and here my experiments have only been partially successful. I placed unexposed plates, in connection with instruments, to detect electrical currents, and then burnt a piece of magnesium wire in front of the plate, and observed whether any indication was given. On a few occasions I have been successful in obtaining evidence of electricity, but in the majority



of instances I admit I have failed. I may add this much, however, I succeeded best with a paper film (an Eastman).

In dealing with delicate instruments for electrical measurement, so many outside influences affect them that at present I am not altogether in a position to affirm that my electrical currents were produced by light action; I believe they were, but until I carry out a few more experiments (and I think I have a new clue now) I must let it rest merely as a belief.

As a further proof that my belief will ultimately become a certainty, I will remind you of an experiment now nearly fifty years old, which Becquerel, the physicist, performed. He coated two plates of silver with chloride of silver in the dark, these were placed in a vessel of water, and light allowed to fall on one of them. A current of electricity was set up, the exposed plate acting as the negative pole. This is an experiment which can be easily tried; I have repeated it with bromide and iodide, and found a greater effect with iodide and bromide than with chloride; in fact, the deflection of the galvanometer needle was in the order named—viz., iodide most, chloride least, and bromide intermediate. This order, I may mention, is in the opposite order to their chemical activity.

Light is not needed to form a latent image, it is capable of being produced to a somewhat limited extent by heat. I saw some months since a query in one of the journals concerning dark lines across the lower end of the plate, and it was answered by some one having a similar experience that it was caused by the leather hinge of the slide absorbing heat and radiating it on the plate. I therefore set to work again, and found that by placing over a plate alternate black and white strips I could get a latent image by merely holding a hot iron for some seconds over the plate. Where the black strips were placed deposition took place during development; where white strips, the glass developed clear. How can this be accounted for on the assumption that the latent image consists of sub-salts? Surely no one will argue that sub-salts are produced by heat?

One more point, and I am done. The subject may not be so interesting to you as it is to me. I may tire you if I continue much longer.

In developing Warnerke's old positive paper (modern bromide paper does not show it so well), if you rubbed the paper with the cleanest of fingers in the developer, or if you rubbed a small piece of unexposed tissue with clean rubber, the developer always developed the mark, and a black stain resulted; how could friction produce either a sub-salt or a photo-salt? Friction does produce electricity.

To sum up, then, I believe an exposed plate to be in an electrified condition, each molecule being in opposite electrical conditions, and that under the electrical action of the developer—unlikes attracting each other, likes repelling—the metallic silver is built up to form the visible image. The exact details of all these actions I leave for another paper. I must ask for time to complete my experiments, and before next session comes round I hope to be able to perform them before you.

This is our last meeting before the recess, and I was anxious to bring up the subject before we separated, so as to gauge your opinions on my theory, and to enlist your assistance with suggestions.

I think the theory is new. I have read up the literature of the subject as far as I could, and I can find no mention of electricity having anything to do with photography—at least, as far as latent images are concerned.

In the words of the learned counsel: That's my case, gentlemen, pitch into me, and pick it to pieces, I shall not mind—I want to arrive at the truth, with your assistance, and if you break down my theory to-night I shall simply go on experimenting, and when I have prepared fresh proofs will bring the subject again before you.

### Notes.

To compensate for the gap recently left in the ranks of the older American photographic publications, we have an excellent new one in "Science of Photography," published monthly, by James W. Queen and Co., of 924, Chestnut Street, Philadelphia; the cost of each number being 10 cents, or about fivepence.

In the second number, for example, we find, among

other items, a capital article on "Posing," illustrated by a series of wood-cuts, and a plate reproduction of portraits by leading artist-painters. Besides this, there is a capital article on "Water Colour Portrait Painting over Photographic Enlargements." Altogether American photographic literature has not lost by the recent changes.

According to the Paris *Figaro*, a photographer was in attendance the other day when a series of experiments were made with the new Freuch army rifle and the bullets fired from it. Rifle bullets attain such a velocity that they push a portion of air in front of them, and what is more, in a photograph, not only is the bullet to be seen in the course of its flight, but also the gathering of condensed air.

The more we read of the wonderful things now accomplished by instantaneous photography, the more we are inclined to lament that it is so comparatively modern an invention. Had it only been invented sixty years earlier, for instance, of what use it might have been in confirming, or possibly, and more appropriately, in "negativng," some of those wonderful stories of a past generation, which are still trotted out at intervals! An instantaneous photograph might have been taken, for example, of at least one of those phenomenally swift balls which used, we are assured, to kill swallows on the wing if they ventured to fly between the wickets, when this or that mighty "trundler" of the past was bowling. A photograph of the ball actually carrying the terrified swallow before it as it went would do more to silence the modern caviller than any number of verbal assurances from veteran cricketers who were "present, don't you know, and saw the thing done, dear boy."

A correspondent who read the photographer's rhyming epitaph lately published in these columns, sends us another which, he says, he himself copied, though he does not state from where. "On the top of the stone," writes our correspondent, appeared the usual style—

"Sacred to the memory of

J.—K.—,

Photographer of this town;"

and then came this extraordinary stanza—

"When Fever focussed him,

Hope forsook him,

And on March the 11th

Death 'took' him."

The above reminds us of an epitaph placed on the tombstone of a local artist who was much given to drawing caricature portraits of well-nigh everyone he met. After giving his name, age, &c., these lines were added—

"So accustomed was he with his pencil

At his fellows to scoff,

That at last from the mere force of habit

He 'took himself off'

on

The 15th of August, 18—

R.I.P."



It is said that aristocratic young ladies in France have taken up the study of photography with great ardour. According to the correspondent of a daily paper, a photographic apparatus is now fitted up in the *boudoir* of nearly every young heiress. Friends, acquaintances, servants, and favourite dogs are all faithfully photographed, and some of the fair votaries of the art are said to be remarkably adroit in using their cameras. As these photographic studies are, according to this correspondent, only taken up to employ the time between the final departure from the convent or the boarding school, and the arrival of the bridegroom, the fashion would be a useful one to introduce over here, because it would serve to intimate that when a young lady takes up photography she only does so because she is not engaged, and is open to an offer.

An interesting love story comes from the Glasgow Exhibition. An official picked up a lady's purse of the pocket-book pattern at the very moment a gentleman was passing the spot. He naturally stopped, and with the official examined the contents to see if there was any clue to the owner. "Here's her photograph, anyway," said the man. "No, it isn't," he added immediately. "It's not a lady's photograph, at all! It looks—you'll excuse me for saying it—extremely like yourself." The gentleman took the photograph and coloured slightly. "Yes, you're right, it is a photograph of me. I think I know the lady, and I am pretty sure I could find her." And so he did. The interesting part of the story is that the discovery of the photograph revealed to him the young lady's secret, and it only remains to say that they are now going to be married.

Considering how often royalty is photographed, the taking of a portrait of a monarch after death seems almost like indulging a morbid fancy. Scarcely was the breath out of the body of the old Emperor William than he was photographed. The same haste was manifested in regard to the late Emperor, but the operation was delayed for a time, the Empress Victoria not giving her consent because the photograph of his father turned out so very badly. However, she allowed herself to be persuaded—the papers do not say by whom—and so the cameras were placed in position, and a couple of pictures taken. There is no accounting for taste, but it seems to us that a photograph of a person taken after death is always more or less repellant, and it is difficult to understand why the members of the Royal family of Germany are so anxious to have these painful mementoes.

#### A TRIP TO THE EAST.

BY DR. MORTON.

I LEFT England for Calcutta and the Burmah Coast on Wednesday, September 27th, 1882. This was shortly after the bombardment of Alexandria and defeat of Arabi Pasha. It is generally advisable before taking a long journey to be acquainted with the best route, means of travelling, and what may be required. Avoid taking what you don't want, as luggage is always *impedimenta*; in fact, many things you can buy almost cheaper

than at home. The facilities afforded for travelling at the present time approaches perfection. The danger and risk to life is reduced to a minimum.

Most of the large steamships making regular journeys eastward take the passage through the Suez Canal, and under ordinary circumstances arrive at Calcutta in 36 or 38 days—this may be called the direct steamship route. However, mails and passengers can travel in less time (about 21 days) by crossing the Continent to Brindisi (south of Italy), take steamer to Alexandria, train across the Isthmus of Suez, re-ship again to Bombay, and train again to Calcutta, or other parts of India. A wonderful advance on locomotion of the past, when a sailing vessel, rounding the Cape, frequently took five months.

The most favourable time of the year to make your outward voyage is during October or November. You miss the rainy season of India—July to September—and come in for what they term the cool season. It really is as warm as our hottest summer, but the transition is not felt so much as if we arrived during an Indian summer—that is, from April to July. Persons going to reside generally procure an Indian outfit, but for a tourist a moderate selection of the lightest clothing and shoes is only requisite. A good, light umbrella, used as a sunshade, also a solar topee or pith hat, and a pair of tinted spectacles, blue or brown, are very necessary, as the sun's rays, about noon, are trying, especially in the Red Sea. I travelled out by the "*Khedive*," one of the P. & O. S. Navigation's fine ships. This Co.'s vessels leave the Albert Docks, or rather now occupy the splendid Tilbury Docks, opened a year or so ago, pick up passengers below Gravesend, twenty-two miles down river. So we took a special train from Liverpool Street Station, Gt. Easteru, to Tilbury, where a steam tug is waiting to convey passengers. The time for leave-taking is very short. We get on board, and the grand ship slowly steams down the river, and waving handkerchiefs are soon left far astern. We proceed round the North Foreland, through the Straits of Dover, into the English Channel, noticing the lamps of Folkestone, Brighton, and the lighthouse off the Isle of Wight, the French coast, of course, to our left. We are now well out to sea, and cross the Bay of Biscay, so much dreaded by susceptible passengers. My recollection, on the outward voyage, was two days confined to my berth, with no food except a cup of tea and a biscuit; and, during a heavy sea in the night, a fine collection of live pigeons were washed overboard, a gun-carriage swept across, and someone complained of salt water in their cabin. But minor troubles like these soon ceased, and as we rounded the coast of Portugal, Cape St. Vincent, we found still water and Gibraltar near at hand. There was dense fog when we approached, and the steam whistle or fog-horn was frequently sounded. The ship, although, in nautical phrase, was standing by, drifted two or three miles before the mist cleared, fortunately for us, as land was close to. We are five days out, the climate is delightfully warm and pleasant, grapes and other fruit cheap, and those who indulge in the so-called baneful weed, tobacco, can purchase only free, good, American grown, at two shillings or less a pound. After a short stay at Gibraltar to coal, we proceeded through the Straits of Gibraltar into the Mediterranean Sea—the deep blue sea. Taking a middle course, having Morocco, Algeria, and Tripoli on our right, and the island of Sicily far out of sight to our left, in four more days we passed the island of Gozo, noted for fruit, &c., near Malta or Millcta, and note St. Paul's Bay, where the Apostle is supposed to have landed A.D. 62. The town of Valetta has a fine appearance from the sea. We stayed in harbour a day, and I had a few hours on shore.

In the Mediterranean Sea we met with many grampus, and shoals of porpoises followed the ship. No one can fail to appreciate the splendid atmosphere, the azure sky and sea, and the brilliant phosphorescence of the rippling water at night as the ship forges ahead. The stars also seem much brighter. In this latitude, life on board ship becomes rather monotonous—at least, for passengers. They have too much leisure, yet to those whose physical powers are weakened and brain overtaxed by arduous studies at home, feel at once benefited by this period of inaction, and secure, as it were, a new lease of life.

There are many little incidents on board, which are worthy of consideration—viz., the regularity and methodical way everything is done is admirable. Meals are always served to the minute. The ship's deck is washed twice a day. The rate of speed is ascertained at stated intervals. A watchman at the bow sounds a gong when he sights a vessel, and every evening at sunset a white light is run up to the foremast in steamships. A green lamp on starboard "right," and a red light lamp on the port-

\* A communication to the Sheffield Camera Club.



quarter. Once or twice during a voyage an alarm is raised by beating a gong, to bring up the crew to what is called their stations in case of fire or impending danger. The passengers are apprised a minute before, so are not alarmed. The crew from all parts take their places in squads beside the boats. The fire engine is got out and the hose tried. All the boats have near them kegs of water ready night and day. Church service is conducted every Sunday, generally twice. I mention these matters as proof of the excellent discipline and precaution. A long voyage suggests graver thoughts, it shows how little we really need to make us comfortable and happy, how dependant we are upon each other; and especially on the wide waste of water, we feel our insignificance before Him who rules wind and sea.

On leaving Malta we make a straight run to Port Said. This town, on the Mediterranean side of the Isthmus of Suez, owes its growth, if not origin, to the great work of the Canal carried out by the French under M. Lesseps, and opened about August 15th, 1865. There were a large number of war steamers, Russian, German, French, and Turks, also three British Ironclads, which made a striking picture.

We had time to go on shore and inspect the place. The streets are laid in straight lines bisected by others. Some fair shops full of English, American, and French goods. But few trees, and these located in a small square. The land is entirely sand. Arab, Nile, and other boats laden with finest melons, line the banks. Divers for coal were busy and somewhat amusing. They plunge down a considerable depth to seek for the coal accidentally dropped into the water. When a piece is found it is placed in a net and hauled in.

After a short stay at Port Said Quay, opposite the town, we proceed onwards, and enter the Canal. The Suez Canal, including lakes, takes a fairly straight course across the Isthmus, and is about 90 miles long. We pass the town of Ismailia, and notice the Khedive's Palace. The Canal is not wide, and when large steamships pass or meet each other, one has to be moored to the side, allowing the other to occupy mid-channel. Vessels are compelled to travel under five miles an hour, otherwise the banks would soon be washed away. Stations and signal posts are placed at intervals, and the track is denoted by large red-painted buoys. I might say that it takes about two days and a-half to pass the Canal. The ships are moored at sunset, and start at sunrise. There is a remarkable stillness and feeling of isolation in resting a long night in the midst of this sandy wilderness. The evening sun effects were peculiarly fine. As the orb of day rapidly settled behind distant mounds of sand the sky assumed beautiful irregular shades of orange and purple, the short shrubs shadowing pools of water close to the Canal had a weird and mystical effect. For several miles there are sand hills but the principal feature, if it can be so called, is a flat, uninteresting expanse of sand extending as far as the eye can reach. We next arrived at Suez, which is about two miles from the Red Sea. The landing place is connected with the town by a railway, but you can walk, or ride on donkey-back on the road parallel with the line. No vehicles were visible when I was there. Suez itself is a dirty town, not desirable for residence; a few mosques, warehouses, shops, and the usual building of an Eastern bazaar. Flies are abundant, especially found on fruit stalls. Ophthalmia, so frequently followed by blindness, is no doubt, in some degree, due to the conveyance of infection by these pests, which may be considered a remnant of the plagues of Egypt. A few miles distant is Moses' well and palm-trees. It was near this spot that Professor Palmer, Major Charrington, and others were massacred. It is a long run from Suez to Aden on the Red Sea, which is our next stoppage. This place, from the Sea, looks simply as a collection of extinct volcanoes, barren and rugged on the coast of Arabia, having Africa and Abyssinia to the south. Rain seldom falls in this locality, yet it is a station for supplying ships with fresh water, which is obtained by distillation. Ostrich feather merchants come on board and do a good business. Diving boys are an institution. They come out in little frail canoes. One has charge of the boat and another performs in the water, dives after money thrown from the ship's side. Silver is preferred to copper, just as at collections in England. It is wonderful how these boys can bring up a sixpence in their mouths long before it reaches the bottom of the sea. Diving is a dangerous occupation, as sharks are prevalent.

Leaving Aden we take a straight line eastward to Ceylon. This most interesting island, as we all know, is situated at the southern point of the peninsula of India, and probably at one time formed a part of that country. The vegetation is most

luxuriant. The cocoanut tree is more abundant than in any part of India. Wild elephants are yet found in the central jungles. We stay at Colombo, S.W. of the island, where a fine breakwater is constructed. The town was founded by the Portuguese in 1520, taken by the Dutch 1656, and surrendered to England Feb. 1796. The important capital, Kandy, is 50 miles inland. A railway runs through from Colombo, and the scenery is simply grand. Having stayed in harbour a day and night, we move off in a northward direction, and for twelve hours have the beautiful verdant island as a distant view. Proceeding across the Bay of Bengal at this time of the year we escape the cyclones which sweep this fine expanse of water. For days you travel through a sea like molten silver, frequently without a ripple, excepting that caused by flying fish, which rise out of the water like silver arrows, skim the surface, and then dip below. A cloudless sky overhead, a gentle motion of the great ship, a swishing sound of water as she speeds about 15 knots an hour, leaving behind a track of phosphorescence visible for miles. A glorious sun by day, and brilliant constellations by night, until we reach Madras, the capital of the Presidency of that name. The city occupies some miles of rather flat sandy coast, which is continually beaten by the heavy swell of the Bay of Bengal. A surf breaks on the shore with great violence, making it very difficult to land. Frequently, waves are so tremendous that the marsoolie, or native boats, cannot live. There is a new breakwater and pier; part was washed away in 1881. All large vessels stand out a mile or more, and passengers who wish to visit Madras must get into the large native boat. They are singular affairs, built of rough planks bound with bands of fibre, as if stitched. The boat has high sides, and the bottom is strewn with branches, as water is expected to come over some part of the short journey, a crew of 12 natives having long oars, consisting of a pole with a flat piece of wood lashed to the ends. A native policeman sits at the stern; but there is no rudder. The men work their oars to a doleful dirge and keep fair time, getting very excited as they approach the beach; advantage is taken of some single wave which lifts the frail bark upwards and onwards with irresistible force until it is stranded. The men immediately tumble out, and assisted by others on land, draw the boat beyond the reach of receding waves. And so we land, and very lucky if the salt water does not give us a drenching. The usual charge is 4 rupees for landing one or two passengers, but the natives endeavour to extort more when you touch the shore, and also are rather troublesome in persisting to offer their services as guides to the place. We engaged one who was useful, although speaking very poor English. I visited the college for engineers and medical school, fine buildings; also the Peoples' Park, a grand tract of land well supplied with dripping fountains. Home comforts in the way of bread and meat are difficult to obtain—plenty of fruit. After walking about in the sun a few hours—and Madras is an uncommon warm place, I hear, at all times—one feels glad to regain our ship, which early next morning resumed her journey. After three days' steady steaming, a tinge of yellowness is observed in the sea, due to the fresh but muddy water of the river Hooghley, a branch of the Ganges. We pass on our right a light ship called "*Lower Gasher*," and another further on called "*Upper Gasher*," and in the distance is noticed a lighthouse situated on Lawyer Island.

It being dark the good ship is anchored for the night. A pilot comes on board at daybreak and takes charge. The navigation of the Hooghley is difficult, owing to sand banks and rapid currents. A special service of pilots are constantly employed. We pass mudbanks for a considerable distance, and then arrive at a place known as Diamond Harbour, 50 miles below Calcutta. Vessels often anchor to wait for the flowing tide, which renders crossing a notable bar sandbank—James and Mary—easier. Ships of all nationalities are seen travelling up and down, steam tugs, and crowds of native craft. The banks are now covered with tropical vegetation—bamboo, paddy (rice) fields, cattle, and much prettier than the Thames, left a month ago. In the distance a forest of masts indicate the port and capital of the Bengal Presidency, Calcutta. We stop at Garden Reach, opposite the ex-king of Oude's palace. An excise officer comes on board, but no duties are levied except on scent, perfumes, and guns. Passengers can leave the ship, instead of proceeding to the jetty, past Fort William.

I left the ship here, as some friends were waiting, and sent a dingy. I only got off just in time, as the screw started, making a swell that all but upset us bag and baggage. A large boatful of natives were overturned just before, but fortunately clung to their boat and were saved. However, I safely landed



and drove off in a ghany, as the cabs are called, and reached my friend's house in the suburbs of the city of palaces. Time will not permit of a full description of this interesting place. The public buildings are very fine. Government House, the Superior Court, Bengal Bank and others; hotels and other palaces occupied by Government officials, wealthy residents, known as Chozumgee, the Park Lane of Calcutta, are well worth looking at. The Park, known as the Maidan and Even Gardens, are very beautiful. There are no real docks, but ships are moored alongside the quays and anchored in the river. A swing bridge up river, which crosses over to Howrah, is an ingenious structure. The streets of Calcutta are broad, unpaved roads. Trams are laid in some of them. The cars are open-seated, with an awning roof. To a stranger, I think the crowds of people, composed of every race and from every clime, strike him as the most novel feature of the place. The caste marks and characteristics of different religions, gives a diversity to the people not seen to such an extent elsewhere. My stay here was only of short duration, as I had to visit the coast of Burmah, known as Arracan or British Burmah, to which I will refer when the slides illustrative of the journey to India have been exhibited.

After a week or so of rest in this city of palaces, I engage a berth on S. S. *Coconada*, one of the British India line of mail coasting ships. They leave Calcutta, I believe, twice a week, touching at all ports as far as Rangoon. A steady steam across the Bay of Bengal brought us, in three days, to Chittagong, three miles up the river, a busy town principally devoted to the export of grain, rice, also tea and coffee. The country from this point, extending some 350 miles of coast east of Bay of Bengal, is called Arracau, or Arakan by Europeans, and Rakhaingpi, or land of the Rakhaiug, an ogre of some kind, by the natives. They have a traditional account of a Deluge, and their first kings reigned in Benares, and to a son of one of these kings Arakan was allotted. It certainly was a country inhabited at a very early period. The country was conquered by the Burmese A.D. 1784, and early in this century, between 1823-24, it was taken by the British in the first Burmese war by a decisive battle at Pagan, troops under Sir Archibald Campbell. A final settlement, 1853, with King Mindohn, father of King Theebaw, who succeeded to the Burmese throne Oct. 1878, and who has, we know, been recently displaced, and his country, generally called Upper Burmah, has been annexed British India. Arracan is also defined as a province, principal town Akyab, and continuous with this district is the province of Pegu, with Rangoon as a capital. Still further south Tannasenui, which has several important towns, as Maulmain and Javoy. It is, however, with Arracan proper, and of that only a limited area, which is illustrated to-night by views taken on this short visit.

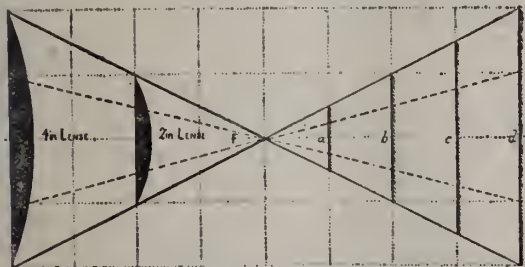
## ON THE DISC OF CONFUSION AS PRESENT IN PHOTOGRAPHIC OBJECTIVES.

BY J. J. HIGGINS, A.M., M.D.\*

### POSTERIOR CONFUSION DISC IN LENSES OF VARIOUS FOCUS.

On full opening and at the same distance from  $F$ , the posterior confusion disc is of one and the same size irrespective of focal

DIAGRAM 4.



Posterior Confusion Disc.

length of lens, and equals the opening of lens multiplied by " $f$ " divided by  $F$ .

Formula.

Posterior confusion disc in all lenses of whatever focus on full opening, " $f$ " being the same is of equal magnitude. } and  $= \frac{O \times f'}{F}$

\* Continued from page 380.

As, however,  $O$  and  $F$  are equal quantities they may be cancelled, and the formula becomes

Posterior confusion disc in all lenses of whatever focus on full opening, " $f$ " being the same is of equal magnitude. } and  $= f'$

Or in other words, if with either a 2, 4, 10, or 20 inch or other focal length of lens, the distance of screen from  $F$  was on full opening one inch, the size of the posterior confusion disc would in each case be one and the same, viz., one inch. It results also that when the reduction of aperture is in equal proportion, as

expressed by  $\frac{F}{n}$  between two or more lenses of differing foci, the same law holds good.

Formula.

The posterior confusion disc in all lenses irrespective of focus is on equal proportional reduction of aperture one and the same for a given or like distance from  $F$ . } and  $= \frac{A \times f'}{F}$  of either lens.

### POSTERIOR CONFUSION DISC IN LENSES OF DIFFERENT FOCUS AND VARYING APERTURE.

Here the same formula is determinative.

The posterior confusion disc in all lenses of whatever focus or aperture. }  $= \frac{A \times f'}{F}$

With apertures alike,\* the distance of screen the same, it is equal in each and every lens.

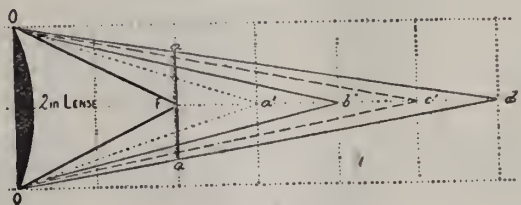
With dissimilar apertures,† and distance of screen the same, it increases in ratio with enlargement of aperture, and "mutatis mutandis" the reverse.

With  $f'$  in corresponding ratio, i.e., with the distance of screen not numerically but correspondingly the same, the distance with the one lens being to its focus as the distance with the other lens is to its focus, it increases or decreases (as the case may be) in the ratio of focus to focus, e. g., for an equal reduction of size of object, say twice, " $f$ " the focus on ground glass with a two-inch lens would be three inches and  $f' (=3.2)$  one inch; with a four-inch lens, six inches and  $f' (=6.4)$  two inches; with a six-inch lens, nine inches and  $f' (=9.6)$  three inches, and with an eight-inch lens, twelve inches and  $f' (=12.8)$  four inches, represented in Diagram 4, respectively, by  $a$ ,  $b$ ,  $c$ , and  $d$ , continuous lines indicating full opening, and dash lines reduced aperture.†

Formula.

The posterior confusion disc in all lenses of whatever focus either on full opening or like reduction of aperture as expressed by  $\frac{F}{n}$  with  $f'$  in corresponding ratio. } varies in the ratio of lens to lens.

DIAGRAM 5.



Anterior Confusion Disc.

### ANTERIOR CONFUSION DISC.

This, as previously stated, is formed by the image of a nearer object upon the ground glass of camera set to the focus of a more distant one (Diagram 1), and is determined by the focal plane of the image (ground glass) intersecting the lines converging from the circumference or opening of the lens to a point " $f$ " at which the nearer object would be in focus. Differing from the posterior in its causation (the anterior by lines converging to a focus, the posterior by lines diverging from a focus), it is found that likewise it is dissimilar, in that it does not increase and

\* As expressed by  $\frac{F}{n}$ .

† Or aperture.

† A two and four-inch lens is only given in diagram, the discs of which are  $a$  and  $b$ . The discs  $c$  and  $d$  are from a six and eight-inch lens, they, however (from want of space), not being represented.



decrease "pari passu" with " $f$ " (the distance of " $f$ " the focus of the nearer object from  $F$ ). For as shown on inspection of Diagram 5 with " $f$ " at  $a'$  (1 inch) it equals  $\frac{2}{3}$  inch, at  $b'$  (2 inches) it equals 1 inch, at  $c'$  (3 inches) it equals  $1\frac{1}{2}$  inches, and at  $d'$  (4 inches)  $1\frac{2}{3}$  inches.\* In the case of the posterior disc the distance of " $f$ " was the chief factor; with the anterior disc it is not.

## COMPARATIVE EXHIBIT.

Discs.	$f'=1$ in.	$f'=2$ in.	$f'=3$ in.	$f'=4$ in.
Anterior ...	$\frac{2}{3}$ in.	1 in.	$1\frac{1}{2}$ in.	$1\frac{2}{3}$ in.
Posterior ...	1 in.	2 in.	3 in.	4 in.

Its mathematical demonstration is based upon the proportion,

$$a : a' :: f' : f$$

$$\therefore aa' = \frac{OO \times f'}{f} \text{ or its equivalent } \frac{OO \times f'}{F + f'}$$

$$\text{and } f = \frac{OO \times f'}{aa'}$$

For reduction of aperture we have but to replace  $OO$  in formula by  $A$ , and the expression for the anterior confusion disc in any lens on reduction of aperture is

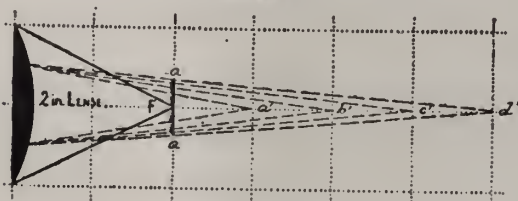
## Formula.

$$\text{Anterior confusion disc in any lens on reduction of aperture,} \left\{ \begin{array}{l} = \frac{A \times f'}{f} \\ \text{or its equivalent} \\ \frac{A \times f'}{F + f'} \end{array} \right.$$

It will furthermore be noticed that the reduction in size of the anterior confusion disc is in direct ratio with that of the aperture. In diagram 6 the reduction of aperture is one-half, and the disc with " $f$ " at the like distances of  $a'$ ,  $b'$ ,  $c'$  and  $d'$  is seen to be and is of only one-half the size.

The general formula for the anterior confusion disc in lenses of all foci and every reduction of aperture, is then

DIAGRAM 6.



Anterior Confusion Disc.

## Anterior Disc, Full Opening.

2 in. lens	} with $f'$ 1 inch	{	dotted lines	=	$\frac{2}{3}$ inch
3 in. lens			dotted lines	=	$\frac{2}{3}$ inch
*4 in. lens			by formula	=	$\frac{2}{3}$ inch
*6 in. lens			by formula	=	$\frac{2}{3}$ inch
2 in. lens	} with $f'$ 3 inches	{	dash lines	=	$1\frac{1}{2}$ inch
3 in. lens			dash lines	=	$1\frac{1}{2}$ inch
*4 in. lens			by formula	=	$1\frac{1}{2}$ inch
*6 in. lens			by formula	=	2 inch

## Anterior Disc, Reduced Opening.

$\frac{F}{2}$					
2 in. lens	} with $f'$ 1 inch	{	dotted line	=	$\frac{1}{3}$ inch
*3 in. lens			by formula	=	$\frac{1}{3}$ inch
*4 in. lens			by formula	=	$\frac{1}{3}$ inch
*6 in. lens			by formula	=	$\frac{1}{3}$ inch
2 in. lens	} with $f'$ 3 inches	{	continuous line	=	$\frac{2}{3}$ inch
*3 in. lens			dash line	=	$\frac{2}{3}$ inch
*4 in. lens			by formula	=	$\frac{2}{3}$ inch
*6 in. lens			by formula	=	1 inch

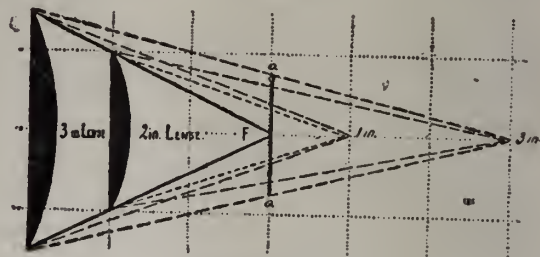
\* Not shown on diagram for want of space.

\* By measurement, "per scale of drawing,"  $aa'$  between dotted lines equals  $\frac{2}{3}$  inch, between full lines 1 inch, between dash lines  $1\frac{1}{2}$  inches, and between external full lines  $1\frac{2}{3}$  inches.

## Formula.

$$\text{Anterior confusion disc in all lenses of whatever focus or aperture,} \left\{ \begin{array}{l} = \frac{A \times f'}{f} \end{array} \right.$$

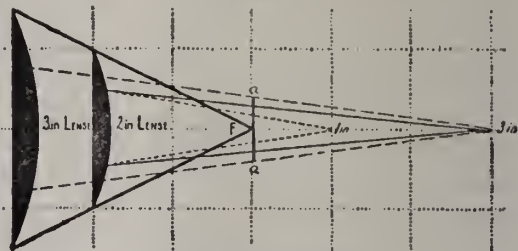
DIAGRAM 7.



Anterior Confusion Disc.

With " $f$ " increasing in proportionate ratio to lens, as instanced in the case of the posterior confusion disc, i.e., for a reduction of image one-half " $f'$ " with a two inch lens would be one inch, and the ground glass be situated three inches from lens (centre). For a like reduction with a three inch lens " $f'$ " would be one and a-half inches, and ground glass be located four and a-half inches from lens; with a four inch lens and

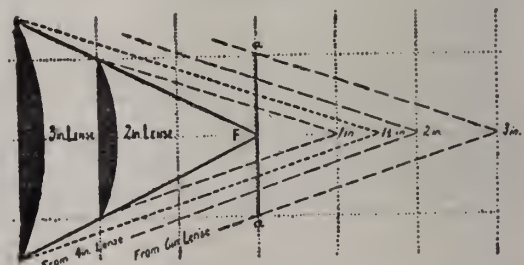
DIAGRAM 8.



Anterior Confusion Disc.

reduction the same " $f'$ " would be two inches, and ground glass would be distant six inches from lens; and with a six inch lens " $f'$ " three inches and ground glass be removed to nine inches

DIAGRAM 9.



Anterior Confusion Disc.

from lens. With such proportionate increase of " $f$ " the anterior confusion disc is seen as proven by formula.

Increasing and decreasing in exact ratio with lens, it being with a

2 inch lens and $f'$ 1 inch	=	$\frac{2}{3}$ inch,
3 inch lens and $f'$ $1\frac{1}{2}$ inches	=	1 inch,
4 inch lens and $f'$ 2 inches	=	$1\frac{1}{2}$ inches,
6 inch lens and $f'$ 3 inches	=	2 inches,

twice that of a three-inch lens, and three times that of a two inch lens. It is evident that, as demonstrated, the anterior confusion disc by no means increases in the proportion of the square of the lens, nor yet again even in ratio therewith, but becomes *de facto* less proportionately as size of lens increases. And again, that as the image of an object is necessarily formed by rays converging to a focus, therefore however great or distant " $f$ " may be, the anterior confusion disc can never equal the diameter or aperture of lens; for this could only take place with parallel rays from which no image is resultant.

(To be continued.)



## THE LITERATURE OF PHOTOGRAPHY.

BY W. JEROME HARRISON, F.C.S.\*

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The numbers for 1859 and 1860 were published by Messrs Cassell, Petter, and Galpin, of Ludgate Hill; those for 1861-2-3, by Thomas Piper, of Paternoster Row.

Continued as

(59a) YEAR BOOK OF PHOTOGRAPHY (THE), AND PHOTOGRAPHIC NEWS ALMANAC. 1864-88+. Small 8vo. Price 1s. Published by Piper and Carter, 5, Fumival-street Holborn, E.C.

The editor of the YEAR-BOOK has usually been the same individual as the editor of the PHOTOGRAPHIC NEWS. The name of G. Wharton Simpson appears on the title-page of the volume for 1863, and "his last work, completed on the very eve of his death," was the YEAR-BOOK for 1880. H. Baden Pritchard edited the volumes for 1881-2-3 and 4, and Thomas Bolas those since that date.

THE YEAR-BOOK has always well merited the description of it given long ago as "the Whittaker of the photographer." For many years past it has contained admirable plates, and a large number of valuable papers from the best known English photographers, besides a mass of other valuable information.

(60) PHOTOGRAPHIC ALMANAC (THE) AND READY RECKONER (LAY'S PHOTOGRAPHIC ALMANAC). One number only was published for the year 1859. It is a small 8vo. volume of 90 pp. (including five pages of advertisements). Price 1s. Published by W. Lay, 13, King William Street, Strand.

In 1860 it was incorporated with the PHOTOGRAPHIC NEWS ALMANAC, and the odd volume of 1859 is sometimes used to make up a set of the NEWS ALMANAC, which is, of course, altogether incorrect.

(61) PHOTOGRAPHIC NOTES. Journal of the Photographic Society of Scotland and of the Manchester Photographic Society. Edited by Thomas Sutton. Published by Bland and Long, 153, Fleet-street; and C. Le Feuvre, Jersey.

Vol. i. for 1856 contains 17 numbers, royal 8vo., monthly, Jan. to August, 4d.; then fortnightly, 3d. each; and pp. xx. and 280, but this paging includes the advertisements. A second edition of the first two numbers (Jan. 1st and 25th, 1856) was published, in which they were "remodelled."

Vol. ii.—and Journal of the Birmingham Photographic Society. 1857. Pp. 470, and index 5pp. Fortnightly, price 4d. Jersey. Published by the editor, T. Sutton, B.A.

Vol. iii., for 1858, pp. 307, and index and contents.

Vol. iv., for 1859, pp. vii. and 307. Published by Sampson Low, 47, Ludgate Hill; and C. Le Feuvre, Jersey.

Vol. v., for 1860, pp. v. and 349.

Vol. vi., for 1861, pp. v. and 359.

Vol. vii., for 1862, pp. 311 and index.

Vol. viii., for 1863, pp. 317 and index.

Vol. ix., for 1864, pp. 338 and index.

Vols. x. for 1865, xi. for 1866. xii. for 1867.

Amalgamated in February, 1868 with *The Illustrated Photographer*.

Thomas Sutton—most versatile and argumentative of photographers—removed to Redon, in France, soon after the demise of *Photo. Notes*. From 1871 to 1874 he acted as French correspondent of the *British Journal of Photography*. He died at Pwllheli, North Wales, on March 19th, 1875.

(62) PHOTOGRAPHIC OPINION. I can learn little about this periodical, except that in 1870 the *Illustrated Photographer* was united with it.

(63) PHOTOGRAPHIC QUARTERLY REVIEW. Edited by

Thomas Sutton, B.A.; two numbers only\* published (for June and September, 1860); 8vo., one shilling each. Published by S. Low, London; printed by C. Le Feuvre, Jersey.

The June number contain 144 pages.

(64) PHOTOGRAPHIC (THE) RECORD AND AMATEUR'S GUIDE. Edited by John Rowland. Fortnightly from June 1st, 1856, to April 1st, 1857; altogether eighteen numbers; 8vo., at 2d. each. Total printed matter 182 pp. (including advertisement sheets).

Published by J. Rowland, 4, Cecil Street, Strand.

(65) PHOTOGRAPHIC (THE) RECORD; the Organ of the Manchester Amateur Photographic Society. Quarterly; price threepence. No. 1 for October, 1887; 8vo., pp. 28 (future Nos. 24 pp., only). Editor, Mr. W. Stanley, 21, Howard Street, Eccles New Road, Salford. Sold by George Wheeler and Co., Printers, 46, King Street West, Manchester.

(66) PHOTOGRAPHIC (THE) TIMES. A Chronicle of the Progress of the Photographic Art. Four vols. (two Nos. only published of vol iv), November, 1861 to January 15th, 1865. Fortnightly, price one penny; 4to.

Vol. i., November, 1861, to December, 1862, pp. 236, published by John Rowland, jun., 409, Strand. Vol. ii., for 1863, pp. 188; and vol. iii., for 1864, pp. 188; published by Thomas Kingham, 409, Strand. Vol. iv., No. 78, for January 15th, 1865, published by J. Clayton, 265, Strand.

(67) PHYSICAL (THE) SOCIETY OF LONDON, PROCEEDINGS OF: 1874-88+; 8vo. The headquarters of the Society are at the Science Schools, South Kensington. All papers read before the Society are also printed in the *Philosophical Magazine*.

(68) POPULAR (THE) SCIENCE REVIEW. A quarterly miscellany of entertaining and instructive articles on scientific subjects.

Edited (Vols. 1-2 by J. Samuelson; 3 to 15 by H. Lawson) fifteen vols.; London 1861-76; 8vo.

New Series. Edited by W. S. Dallas. Vols. i.-iv., and Nos. 17, 18, 19, of Vol. v.: 1877-81; 8vo.

Altogether 20 vols., all published at 12s. each, bound; by Bogue, 3, Trafalgar Square, London.

In this pleasantly-written magazine the principal contributors on photographic subjects were J. Traill Talbot, W. Crookes, and H. Lawson.

(69) PORTFOLIO (THE). An artistic periodical, 1870-88+. Edited by P. G. Hamerton. Folio; monthly, price 2s. 6d. Seeley and Co., 46, Essex Street, Strand.

Each number contains 24 pp. of letterpress, and two plates; etchings, photographs, &c.

(70) QUARTERLY JOURNAL OF MICROSCOPICAL SCIENCE. Edited by Edwin Lankester and George Busk. 8 vols., 8vo. London, 1853-60.

Continued as:—

(70a) QUARTERLY JOURNAL OF MICROSCOPICAL SCIENCE, including the Transactions of the Microscopical Society of London. New series 1861-88+; price half-a-crown. J. and A. Churchill, 11, New Burlington Street.

The *Microscopical Journal*, 1841 and 1842, 2 vols., edited by D. Cooper and G. Busk; and the *Transactions of the Microscopical Society*, 1844-52, 3 vols., may be considered as predecessors of the *Quarterly Journal*.

## Patent Intelligence.

\*. The following ought to have been at the head of Vogel's Amended Specification, No. 15,532, of 1886, which appeared in our last, and it is suggested that readers should mark p. 381 to this effect; otherwise, confusion may arise between the original specification (printed by us previously) and the amended specification printed last week.

## AMENDED SPECIFICATION.

Reprint.—This Specification has been reprinted in consequence

\* Continued from p. 211.



of an amendment made by order of the Comptroller prior to the sealing of the Patent.—Date of application, 29th November, 1886. Specification accepted, 21st January, 1887.

#### Applications for Letters Patent.

- 8,413. SAMUEL HERBERT FRY, care of Samuel Fry and Co. (Limited), Kingston-on-Thames, for "Improvements in the manufacture of photographic films."—June 8th, 1888.
- 8,447. JOHN WILLIAM TURNER, 4, Clayton Square, Liverpool, for "Improvements in photographic cameras, part of which is applicable to other photographic apparatus."—June 9th, 1888.
- 8,471. ERNEST PERRETT, 77, Chancery Lane, London, W.C., for "Improvements in photographic cameras."—June 9th, 1888.
- 8,518. AUGUSTE EMMANUEL LETALLE and FREDERICK BILLING, 6, Livery Street, Birmingham, for "Photographic stained glass."—June 11th, 1888.
- 8,535. WILLIAM HARDING WARNER, St. Augustine's Chambers, Unity Street, College Green, Bristol, for "An improved photograph or picture-holder."—June 11th, 1888.
- 8,618. SAMUEL HERBERT FRY, care of Samuel Fry & Co. (Limited), Kingston-on-Thames, for "Photographic films."—June 12th, 1888.
- 8,706. JOSIAH PUMPHREY, 160, Angelina Street, Birmingham, Warwickshire, for "Improvements in the form of dishes for developing photographic plates adapted to, and including apparatus for, lifting and replacing the plates."—June 14th, 1888.

#### Patent which has become Void through Non-payment of Duty.

- 4,594 of 1884. J. BROWN.—Obtaining printing surfaces by photography.

#### Specifications Published during the Week.

- 5,545. FERDINAND HURTER, of Wilmere House, Bold, Widnes, in the County of Lancashire, Analytic Chemist, and VERO CHARLES DRIFFIELD, of Mount Pleasant, Appleton, Widnes, in the County of Lancashire, Engineer, for "Improvements in instruments for calculating photographic exposures."—Dated, 14th April, 1888.

Logarithmic scales as to enable a photographer to ascertain at a glance the length of time during which the sensitive plate must be exposed in the camera in order to procure a satisfactory negative.

- 8,711. THOMAS RUDOLPH DALLMEYER, of 19, Bloomsbury Street, in the County of Middlesex, Optician, and FRANCIS BEAUCHAMP, of High Cross, Tottenham, in the County of Middlesex, Engineer, for "Improvements in apparatus for regulating exposures in the use of photographic shutters."—Dated, 16th June, 1887. (The full text and sketches will appear next week.)

### Correspondence.

#### A PHASE OF COMMERCIALISM.

SIR,—Customers often order our goods through other houses, but it sometimes happens that our goods are not sent though invoiced as our make. As an example, we may say that we have to-day received from a London House a curt request to exchange a 10 by 8 double back, with a notification that their customer is "exceedingly cross" at the "bad workmanship," it "having started in many places." On inspecting the back in question, we find it was not made by us—in fact, a more discreditable piece of workmanship it has not often fallen to our lot to inspect. Our object in writing this is to warn other enquirers for our goods, and also with a wish that this letter, if inserted in your journal, may meet the eye of the party complaining, who evidently has much cause for feeling annoyed.—Yours truly, W. W. ROUGH & Co.  
180, Strand, London.

#### ATTEMPTS AT JUDICIAL IDENTIFICATION MINUS AN ADAPTED UNIT.

SIR,—The theorists are right, no doubt, who place implicit reliance upon photographic portraiture (whether of the face or of the hand) as a matchless and unerring instrument of scientific and, therefore, of legal identifica-

tion. But, oddly enough, my collaborators in this matter have entirely overlooked a most material factor in the process. Yet it was explicitly set forth in the *brochure*, from the publication of which dates a new and now widely-recognised phase of identification by photography. But, really, the experts and the professors ought to be aware that to elevate to the status of legal infallibility either the ordinary "look and say" method, or even that of a couple of "fiducial lines," amounts simply to the enthronement of the "rule of thumb."

That which the present writer wrote in 1875-76, is equally cogent in 1888.

"Certainly, the indispensable preliminaries of a function so judicial are an accepted scale of admeasurement and an adapted nomenclature. A scale of inches and of its subdivisions will not serve the required purpose. Obviously the scale must be of such a nature as will operate independently of the ever-varying magnitudes of the portraits to be examined—it must remain unaffected by the differing powers of the lenses employed in the production of such pictures.

"And how may such a *desideratum* be arrived at? And what must be the specially adapted constituent of such a scale? The answer is this:—The 'unit' of an admeasurement of this nature must be a fractional part—a well-defined fractional part—of the given whole. It must be a fractional part which shall exist under identical conditions in each face submitted to the test: the first and most obvious consequence being that such fraction will vary always in equal ratio with the varying magnitude of the whole picture."—*Identity Demonstrated Geometrically*, by Wm. Mathews, Editor, late of 'Weston-super-Mare Gazette,' &c.

Whether with or without an efficacious principle of admeasurement, it is, of course, correctly assumed that the lapse of time develops no material change in the matured structure, whether of the hand or of the face. Permanency, therefore, in the fabric, and relevancy in the unit of the admeasurement, are the two essential conditions of a successful issue. But the latter consideration, thoughtlessly, has been lost sight of by the experimenters.

Here follow the instructions which were offered in reference to portraits of the face only:—

1. Let a right line be drawn from centre to centre of either pupil.
2. From the given centres describe arcs intersecting each other, above and below the given line, of a radius as the distance between the centres.
3. From the points where the arcs cut each other produce the perpendicular. This will necessarily be the true facial perpendicular, whatever may be the pose of the sitter.
4. Lay off a parallel on either side of the perpendicular at the distance of the given centres.
5. Lay off a series of parallels above and below the line of the pupils and let their measured distance apart be that of exactly the diameter of the iris.

Omitting, if you shall see fit, the details applicable to the admeasurement of portraiture of the face, permit me to consider them as applied to the hand.

For the accurate admeasurement of the hand, the most eligible starting-point and basis of procedure will, undoubtedly, be the higher horizontal lineation of the main finger. Accepting this as the zero-point or cipher line of the admeasurement, the first thing to be achieved is the erection of a perpendicular, such as shall constitute the true axis of the portrait, from the finger-tip to the wrist. This may be effected by either of the customary geometric methods. Then comes to be considered the selection of the unit length which shall be deemed to be best calculated to yield successful results. And hereupon, for ascribable reasons, it may be safely laid down that the space extending upwards from the recognized cipher-line to the apex of the elliptical convolute on the frontal summit of the main finger will be found to be the least affected by the possible curva-



ture and consequent foreshortening of the hand. This "unit length," then, being accepted as the one most reliable, a sufficient number of parallels of that ilk should be accurately laid off below and above the cipher-line; and the ends of these, reaching to the margin of the portrait, should be consecutively numbered from the cipher-line. The hands of the two epochs being similarly and carefully dealt with, there remains but the verdict to be delivered; and this, whatever be its tenor, may be pronounced immediately and infallibly.

The insertion in these columns of the very effective phototype of the hand by Mr. D. C. Dallas has placed before me an inviting opportunity for dealing with this topic; and, by your courtesy, there has been here re-inserted this high-class and typical illustration. It may assist to the better exposition of the matter; but it might



Hand by Mr. D. C. Dallas, Judicially Admeasured.

prove desirable to add that the reproduction of the lines of measurement in white strokes upon the flat printing surface of the block carries with it the disadvantage that such lines will less distinctly appear in corresponding ratio to the care bestowed by the printer in giving effect to the finer details of this phototype. W. MATHEWS.

*Alma Dale, Clifton, Bristol.*

#### ALLEGED DELETERIOUS MOUNTS.

DEAR SIR,—The report in your last issue of Robinson v. Davies & Co., is rather meagre, and, consequently, not quite clear to the general reader, as it was distinctly proved that the fault complained of did not arise from the cards, but from imperfect manipulation.

The judge agreed with our counsel that, in supplying

the goods there was no warranty; but as we would not shield ourselves behind a technical point, we wished the case to proceed upon its merits, a course which his Honour remarked was always more preferable and straightforward.

Although it was asserted, on behalf of the plaintiff, that the mounts contained oxide of iron as a matter of fact, they do not contain a particle, and we say this on the authority of one of the first London analysts. But our case was that we could produce scores of experienced photographers who had used mounts made from the identical batch of card-boards, and with every satisfaction. Those witnesses we did produce also said in evidence, that the discolouration of the photo. complained of did (not "might") arise, in their opinion, from "under-toning and imperfect fixation."

Supposing the mount had contained oxide of iron, it would not have been injurious to the print, provided that the latter had been treated with ordinary care and washing. We produced a mount in general use, the surface of which is entirely composed of baryta white and yellow oxide of iron, which it is found in practice has never affected the print in the slightest.

It should be mentioned that the mounts in question were light grey enamel, and not chocolate colour, which latter, photographers generally recognize that there is some difficulty in using, although, in no case that we have seen, has any difficulty arisen where the prints were properly manipulated.

As it is a matter of general interest, perhaps you will kindly insert these few remarks.—Yours faithfully,

DAVIES & Co.

21, Bevis Marks, London, E.C., June 13th, 1888.

#### Proceedings of Societies.

##### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE usual weekly meeting was held on the 14th inst., R. KEENE in the chair.

J. B. B. WELLINGTON showed the results of some experiments he had made with Platinotype paper printed out. The paper is rather slow in printing, but he believed that it could be made as quick as albumenized paper. He was not prepared with full details as his experiments were not complete.

The Chairman passed round Captain Pizzighelli's printed circular.

W. H. HARRISON remarked upon the high price of platinum salt.

E. HOLT passed round an albumen print on zinc, ready for etching.

J. WINTER exhibited a series of photogravures by Annan and Swan.

W. H. HARRISON asked how steel facing on copper plate was done.

A. HAYDON said it was an electro deposit from a bath of ferrous sulphate of magnesia sulphate made neutral by addition of magnesia carbonate.

The remainder of the evening was occupied with notices of alterations of rules and nominations of officers proposed for election at the annual general meeting on the 23th inst.

##### MANCHESTER AMATEUR PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of this Society was held at the Manchester Athenæum on Tuesday, June 12th, the President, the Rev. H. J. PALMER, M.A., in the chair. The following were elected members of the Society: Messrs. Fred Adshead, Chorltoncum-Hardy; Frank Brooke, Stockport; John Faulkner and W. H. Faulkner, Harpurhey Hall; Henry Goldsmith, Bowdon; John Miller, Salford; J. H. Newsome, Cheetham; and W. Turner, North Reddish.

THE HONORARY SECRETARY (F. W. Parrot) read a report of the ramble to Agecroft Hall, Kersal Hall, and Kersal Cell, on Saturday, May 12. The day was beautifully fine, and over eighty members and friends were present; seventy-one cameras were used, a number altogether unprecedented. The leaders of the rambles to Moreton Hall, Dovedale, and Lymra reported the numbers present, and the leaders of the rambles for the coming month announced the arrangements made.



The PRESIDENT read a paper on "The Preparation of Sensitive Films." His attention had been directed many years ago to the subject of sensitive films, owing to the difficulties experienced during photographic tours in the Alps. First there was the difficulty of passing the Custom officers, whose suspicions were usually aroused by the small heavy parcels of glass dry plates; then the heavy weight of any number of plates were taken; and finally, the risk of breakage at every stage of the journey. Films are lighter, less bulky, and practically unbreakable. The formulae and method of preparing the films were minutely described, and will be published in the next number of the society's organ, *The Photographic Record*.

GEORGE WHEELER read a short paper on "A Simple Extension to the Camera for Copying Purposes," describing the method of making and using the same, and exhibited a bromide print enlarged with this extension from the size of a postage stamp up to cabinet size.

Several members exhibited photographs taken on the various rambles of the past month.

LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY. THE first out-door meeting of the above Society took place on Wednesday 13th inst., when the members amalgamated with the Loughboro' Photographic Society. Having travelled through beautiful scenery until Ambergate was reached, here the party detrained, enjoyed a frugal lunch at the hotel, and whiled away the time remaining by a closer inspection of the local scenery. Embarking again, Wingfield station was soon reached, and Wingfield Manor, a distance of a mile, was the point of operation. A pleasant surprise here awaited the party in the unexpected meeting with a few members of the Derby Photographic Society, consisting of Messrs Scotton, Walker, Hart, Cooper, and Sabry, most of whom having been before their acquaintance with the place was most useful to those to whom the locality was new. For some the crypt, with its quaint sculpture and groyne, absorbed the whole of the time available, necessitating a two hours' exposure; while to others the ruined front and interior offered numberless points of focus. After having exhausted the time and light available, the party sat down to a most excellent tea, which was thoroughly enjoyed, M. Sabry contributing more than his share to the general fund of merriment, which brightens the recollection of a happy finish to a well-spent day. The usual group was taken by the Director-General of the party, J. W. Taylor, as also a character negative commemorative of historical events occurring about the time when the hapless Mary, Queen of Scots, was an inmate of the manor. The party then retraced their steps to Wingfield station, where, having a little time on hand, an impromptu meeting was held. A vote of thanks was proposed and carried with acclamation and tendered to Mrs. W. T. Tucker for her kind offices at the tea-table. It was then proposed and carried that, on that day four weeks, viz., July 11th, the societies meet at Haddon Hall, to which meeting all will anxiously look forward. Exactly 100 plates were exposed by the party, and so far as is ascertained, has resulted in a fair average of good pictures.

## Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—Technical meeting, Tuesday, June 26th, at 8 p.m. Open at 7 for journals and conversation.

A RAILROAD PHOTOGRAPHER AND THE CATS.—His functions are various. When engines or carriages of a new pattern are constructed he takes a record of their features. Again, perhaps it is reported to the engineer that a viaduct shows signs of giving way, that a wall has cracked, or an embankment slipped, and in the first instance if the damage is only slight, instead of going himself to see the state of affairs, he sends the photographer to see and record it for him. Or if an accident has happened, there can be no dispute afterward how the engine was lying, or whether such and such a carriage left the metals, once a commission has been issued to take evidence of the sun. A few miles off, however, at Trent, we found a yet more remarkable portion of the company's staff, eight cats, who were borne on the strength of the establishment, and for whom a sufficient allowance of milk and cat's meat was duly provided. And when we say that the cats have under their charge, according to the season of the year, from 100,000 to 300,000 or 400,000 empty corn sacks, it will be admitted that the company cannot have many servants who better earn their wages. The holes in the

sacks, which are eaten by the mice which are not eaten by the cats, are darned by twelve women, who are employed by the company.—*Murray's Magazine*.

THE HYDROKINONE DEVELOPER.—E. Williams, of Hawkhurst, writes:—"In using the hydrokinone and soda developer, I have noticed that it is not necessary to rock the plate, and that exposing the plate to the air by lifting it from the developer occasionally much expedites development."

CARDIFF AMATEUR PHOTOGRAPHIC SOCIETY.—An exhibition of photographs, photographic apparatus, and appliances, will be held at the Assembly Rooms, Town Hall, Cardiff, from the 22nd to 27th of October, 1888. Numerous medals and certificates are offered for competition, but the judges shall have the right to withhold any medal or certificate on the ground of insufficient merit, and their decision shall in all cases be final. A curious feature connected with the arrangements is that all communications requiring a reply must contain a stamp, and a circular informs us that letters should be addressed to the Honorary Secretary, G. H. Bedford, 127, Bute Road, Cardiff.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting, June 27th, will be on "The Powder Process." Saturday outing at Bromley, Kent.

## To Correspondents.

\*. Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

WILLIAM HEIGHWAY.—Your article reached us in an envelope open all along the top, and no letter or other communication accompanied it. Please send us your address.

W. T.—Thanks for the specimens, which are noticed in another part of the paper.

WM. ASHMAN.—The MS. of the second article has been found, and the third is to hand.

A. W. WARD.—To get the kind of effect you speak of a rather acid nitrate of iron developer is used. You will find information in any comprehensive article on ferrotyces.

LOO.—1. It is quite possible to print on it by daylight, but artificial light is generally preferred, as it then becomes easy to make a series of exposures which shall all be equal. 2. The same remark applies in this case, but we cannot specify for any definite time for exposure, as conditions vary so much. 3. Not essential by any means; indeed, it is often an advantage not to use it, especially when plates are under-exposed.

G. EDEN.—1. The red precipitated sulphide of antimony is generally used, but the presence of a certain proportion of free sulphur is essential. 2. We have long wished to get the information, but hitherto have been unsuccessful. 3. It decomposes rapidly in aqueous solution, but if dissolved in alcohol is more stable. 4. Write to Mr. Williams.

EDITH.—We can hardly advise in such a case, as we do not know all the circumstances; but as far as the information before us goes, we are inclined to think that the probabilities of success are not large.

F. BARTLETT.—The paper is saturated with some greasy matter, and we take it that this is the source of your trouble. Perhaps if you sponge one surface over with a weak alkaline solution, and then rinse, there may be an improvement.

C. PARKER.—Write to the Secretary of the Society of Arts, John Street, Adelphi, London.

PURCHASER.—We cannot see what ground you have for reasonable complaint. The dealer offered to sell you a single pound for 24s., at the same time clearly intimating that to sell so small a quantity was rather exceptional. Instead of accepting this offer you send 6s. 6d. for a quarter of a pound, saying that the odd sixpence is for postage, &c. We think the firm is quite reasonable in giving you the choice of allowing you as much of the material as the sum will cover at the price per ounce, viz., 2s., or of receiving your money back minus 4d., for the cost of sending. An exceptionally civil business house might have returned your cash post free, and without deduction; but, on the other hand, there are firms that would have been less considerate. Some, indeed, might have been bearish enough to send an unpaid letter intimating that your remittance was at the office awaiting removal by yourself or agent, and that you would be charged rent until the time of its removal.

W. MITCHELL.—The picture you send is exceptionally clear and fine as regards definition, both of foreground and distance, and we agree with much that you say.



# THE PHOTOGRAPHIC NEWS.

Vol. XXXII. / No. 1556. — June 29, 1888.

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### THE ROYAL METEOROLOGICAL SOCIETY AND PHOTOGRAPHS OF LIGHTNING.

THE Meteorological Society has just issued the following additional circular on this subject :—

"The Council of the Royal Meteorological Society are desirous of obtaining photographs of flashes of lightning, as they believe that a great deal of research on this subject can only be pursued by means of the camera.

"The Council would esteem it a great favour if you, or the institution which you represent, could give them any assistance in this matter, either—

"1. By sending them copies of any photographs of flashes of lightning that may have already been taken.

"2. By endeavouring to procure them yourself, or to interest others in so doing.

"It may perhaps be well to mention that the photographing of lightning does not present any particular difficulties. If a rapid plate, and an ordinary rapid lens with full aperture, be left uncovered for a short time at night during a thunderstorm, flashes of lightning will, after development, be found in some cases to have impressed themselves upon the plate. The only difficulty is the uncertainty whether any particular flash will happen to have been in the field of view. A rapid single lens is much more suitable than a rapid doublet; and it is believed that films on paper would effectually prevent reflection from the back.

"The focus should be that for a distant object; and, if possible, some point of landscape should be included to give the position of the horizon. If the latter is impossible, then the top of the picture should be distinctly marked. Any additional information as to the time, direction in which the camera was pointed, and the state of the weather, would be very desirable.

"The Council hope, now that the thunderstorm season is approaching, many photographers, both amateur and professionals, may be found willing to take up this interesting branch of their art.

"Last year a similar circular was issued by the Society, and about 60 photographs of lightning flashes were received from various parts of Europe and America. A photographic reproduction of some typical pictures is herewith enclosed.

"These photographs have brought out several facts about lightning which have hitherto been entirely unsuspected.

"The Committee of the Society who are now investigating the subject feel that the amount of material at their disposal does not justify them in making any generalisations at present. They therefore earnestly appeal to you and others for further photographic evidence of the true nature of lightning flashes.

"WILLIAM MARRIOTT, Assistant Secretary.

"30, Great George Street, Westminster, June, 1888."

### THE SPECTROSCOPE OF THE LICK OBSERVATORY.

FROM time to time we have illustrated and described the progress of the magnificent Lick telescope from which astronomers hope so much, and now we extract from the *Scientific American* a description and illustration of the spectroscopic attachment.

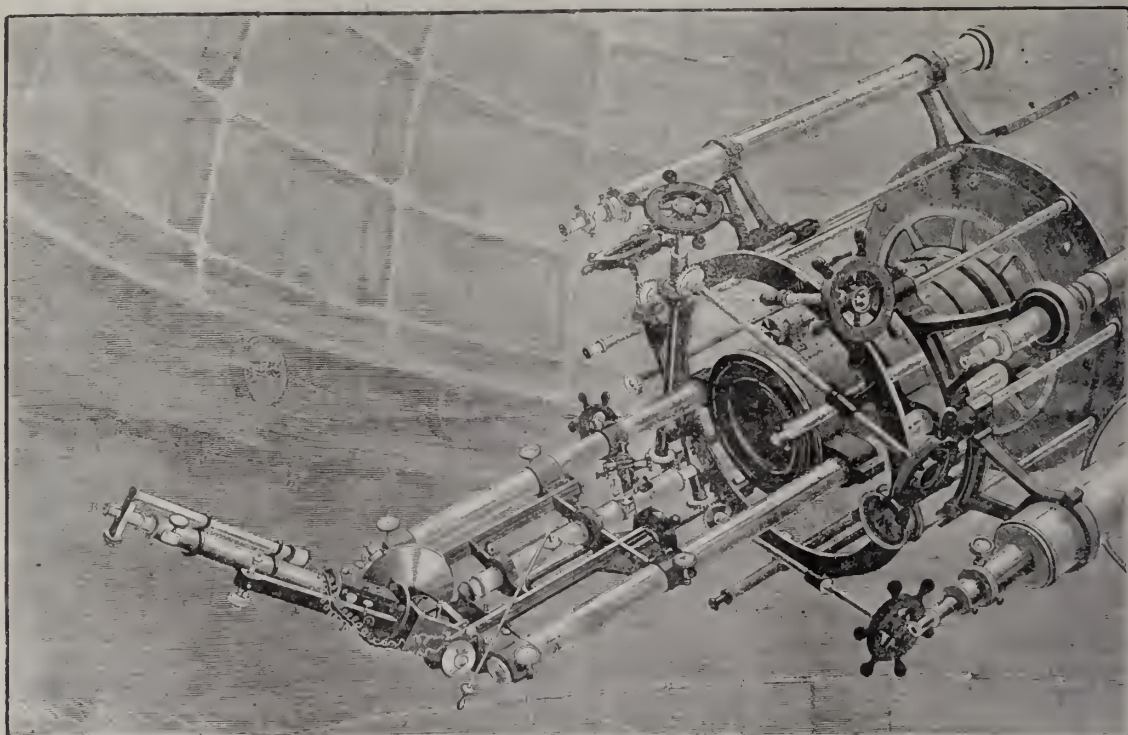
The *Scientific American* says :—

There has recently been constructed at, and shipped from, the astronomical instrument works of Mr. John A. Brashear, Allegheny City, Pa., a spectroscope of unusual power and completeness. It was forwarded to its ultimate destination, Lick Observatory, Mt. Hamilton, California, there to be employed in astronomical research in connection with the great telescope. The contract for the spectroscope, which was let in December, 1886, called for an instrument of the highest capabilities, and for adaptation to the pursuit of two special studies. These were : 1, the study of the physical constitution of the stars, and, 2, the important study of stellar motion in the line of sight. To conduct the latter study requires mechanical adjustment of the greatest delicacy. The spectroscope in question is of the compound order—i.e., possessed of both prisms and gratings. Of prisms, the instrument includes in its equipment three varieties. Of gratings, it contains one of the largest and most dispersive ever made, showing 46,000 parallel lines, ruled by a diamond splinter upon speculum metal, and so closely placed as to number 14,438 to the linear inch. This number is regarded as the best for general work. The ruling was done by Professor Roland, of the Johns Hopkins University, Baltimore, the plates being made by Mr. Brashear. The power conferred by this grating upon the spectroscope is equivalent to that of at least fifty prisms—assuming it to be possible for that number to be used at once. The office of this vital portion of the instrument is the dispersion of light, thus enabling the observer to define the nature of its source. For the purpose of comparing the spectra of celestial objects with those of known elements (in combustion), a "comparison attachment" forms part of this spectroscope. By its use, and with the aid of the electric current, can be obtained spectra of all gases or metals, which spectra, by means of a totally reflecting prism, can be sent into the spectroscope and there displayed, superimposed on a spectrum of a star or other celestial body. By means of a device invented by Professor J. E. Keeler, of the Lick Observatory, the two spectra can be placed in such exact relations with each other, and these relations and their absolute coincidence or displacements measured so accurately, that the study of stellar spectra, it is confidently expected, will be greatly advanced. The action of this instrument upon light may here be briefly outlined. The ray, proceeding from some infinitely remote body under contemplation, through the 36-inch lens of the Lick telescope, falls upon the



slit of the collimator of the spectroscope, thence spreading in a beam that falls upon the lens of the collimator, to emerge therefrom in parallel rays that fall upon the grating, or pass through prisms, as the observer desires. Through the use of a prism, a single spectrum is produced—if the prism is of glass. With the grating, a multiple spectrum is obtained—a result of the highest importance, in that the separation of the dark lines is so much greater, that these lines—the indices of the nature of the remote body—can more readily be identified and their significance inter-

preted. An additional advantage in the use of the grating is the production of a normal spectrum. With the prism the spectra show a compression or "crowding up" at the red end. By means of the observing telescope that forms a part of the Brashear instrument, the first, second, third, or fourth spectrum can be taken up and studied. This powerful instrument will be rigidly attached to the Lick telescope by means of steel projections at the eye end of the larger instrument. Every arrangement has been made for the most delicate adjustment, and for the



A A, steel support rods on end of telescope; B, observing telescope, 22½ in. focus, 2½ in. aperture; C, collimator; D, reversion attachment, containing a Christie half prism and reversion prism; E, reversion micrometer; F, prism and refraction grating table; G, graduated circle and vernier; H H, counterpoises; J, electrical comparison attachment.

SPECTROSCOPE OF THE LICK OBSERVATORY.—(From a photograph by H. E. Matthews.)

collimation of all optical parts. Micrometers are employed for reading with the greatest degree of accuracy, and to the 1" of arc, and by the use of delicate and accurate mechanism, the relative qualities of the two spectra—that produced artificially and that from a celestial body—can be studied most satisfactorily. This spectroscope has been tested in the solar spectrum with splendid results, the great B group coming out with remarkable clearness and sharpness.

#### CONTINENTAL PHOTOGRAPHY AT GLASGOW INTERNATIONAL EXHIBITION.

NOTES BY AN OCCASIONAL CONTRIBUTOR.

From the very first those in charge of the photographic section considered that additional interest would be given to this section were it made international in character. Accordingly, the convener of the section, Wm. Lang, jun., was sent over to the Continent last autumn, for the purpose of inviting and obtaining contributions. It should be here stated, however, that the services of corresponding members had previously been secured, which facilitated greatly Mr. Lang's mission in the various centres. These members were Dr. J. M. Eder, of Vienna, Dr. Liesegang, of Dusseldorf, and M. Leon Vidal, of Paris. In

America two representative men were found in F. C. Beach, of New York, and F. Ives, of Philadelphia. The hearty co-operation of these gentlemen has, from the first, enabled the section to get together not only an unique, but highly interesting collection.

Taking the foreign exhibits in the order in which they come in the catalogue, the first to arrest our attention are two large companion pictures of Cologne Cathedral, by Anselm Schmitz, Cologne. One view (1928) representative of the interior, the other (2,304A) of the exterior. Surely these are the largest direct photographs to be found anywhere, measuring as they do some 40 in. by 31 in! The method of mounting seems also a good one. The prints have been laid in the first instance on a somewhat thin paper mount, which, in turn, has been laid down on a cloth stretched on a frame, after the manner of a mounted canvass. The view of the Cathedral is altogether an unique one, as Schmitz was at considerable trouble and expense in having a platform specially erected whereon to take it. Notice may here be taken of another colossal photograph (2,392), by the same person, which is shown on one of the screens in the centre of the gallery—this is a view of the staircase in the Royal Palace at Bruhl.

The Nadars of Paris have contributed a very interesting frame (1,934). An excellent bromide portrait of Sarah



Bernhardt forms the centre, while, grouped all round, are portraits of the actress in her various rôles.

1,940, "Views in Norway," by M. Selmer, of Bergen. The gallery is somewhat rich in views of Norway. Valentine, of Dundee, contributing a series of views in Platinotype; and an amateur, Prof. Rose, of Liverpool, a large frame, containing a great number of views, half-plate size, silver prints. The subjects chosen in several instances are the same, and, when we come to compare notes, the advantage seems to us to be with the Norwegian artist. Selmer contributes a series of Norwegian costumes (1,987). He has also forwarded a duplicate set (2,364), which have been hand-coloured. These coloured pictures, along with other coloured reproductions, have been placed in the vestibule in the grand hall leading into the Photographic Gallery. Coloured photographs, as a rule, are not particularly desirable, but one cannot help admiring the effective manner in which the bright costumes have been rendered. A firm in Salzburg, Wurthle and Spinnhorn, have forwarded a great number of pictures of the picturesque scenery found in the Tyrol. Many of the places shown have been well described by the late Baden Pritchard in his "Tramps in the Tyrol," notably Zell-am-See, Traunsee, Innsbruck, &c.

In (1950) we have what is called a study in lightning, by Boissonas, of Geneva. It represents Faust in his laboratory, and in the background the moonlight is seen streaming through the chequered window, casting the shadow of the framework on the floor.

The Berlin Photographic Company have two very fine photogravures, which may be considered companion pictures to "Magdalen," after G. Max (1,964), and "Mignon," after the same artist (1,983). An American amateur, F. A. Jackson, contributed two silver prints, "Shade, Shadow, and Sunshine" (2,010), "Entrance to Yale Art School, New Haven County" (2,304).

Photogravure in Berlin finds an able exponent in R. Schuster. A picture of lions after Friese, entitled "Enemy in Sight" (2,022), and an enlargement from a negative (8 by 5) of the Acropolis (2,089), are well worthy of attention. Boissonas' two frames (2,087), children and animal studies, and (2,099) studies of children, contain pictures which, in interest and in execution, are unsurpassed in the present collection. The children have been photographed wholly unconscious that the eye of the camera has been upon them. In one series we see a child playing with a puppy in all sorts of attitudes, in another a doll is the source of attraction. Perhaps the finest series of all are four cabinet pictures of a child trying to poise a sponge on the back of a toy sheep which stands in a bath. The first picture shows the balancing of the sponge; the second the hands just lifted away from the sponge; the third shows the expression of delight on the child's face; and in the fourth, the child, with hands raised to its head, contemplates its handiwork. So rapid have the different exposures followed on each other, that the model's feet are in the same position throughout.

Reutlinger, of Paris (2145), contributes a frame of portraits in silver and Platinotype which, although representing the commercial phase of photography, are conspicuous for the quality of the half-tones. In 2151 we have a view of the Portuguese Amateur's (Carlos Relvas) studio, which gives one an idea of the scale on which this gentleman operates. Specimens of his work in ordinary silver printing are to be found in Nos. 2155, 2198, &c.

A preference seems to be given to a warm red tone by Mr. Relvas, while most of his pictures are mounted in optical contact. A Swiss lady, Miss Elise Hinnen, of Zurich, has a most interesting frame of views in Switzerland (2179). Herr Lowy, of Vienna, contributes views of some of the principal buildings of the Austrian Capital—"St. Stephen's Tower," "The Rathhaus" (2216), and a panoramic view (230), showing the Houses of Parliament, Rathhaus, Imperial Palace, and many other of the

magnificent buildings which have been erected in the Ring Strasse.

The Vienna ladies have always been noted for their good looks. A frame of portraits by the same artist (2235), serves to confirm this. The only specimen of the well-known amateur (F. C. Beach's work) is to be found in 2265—"New England Elms." Among the many photo-mechanical processes, reference may be briefly made to the "Heliogravures" (2312), furnished by the State Printing Establishment of Austria to the phototype methods of Angerer and Goeschl (2343, 2347), and Jaffe and Albert (2,374), both of Vienna. This successful method is to be found in 2,316. A photogravure of the late German Emperor, by Schuster (2,332), has now a melancholy interest attached. A frame of prints on aristotype paper, contributed by W. Cronenberg, serves well to show the character of the image obtained on a gelatine paper. To some the highly-glazed appearance of the pictures may be an objection, but an extra amount of detail would seem to be brought out in the shadows. The paper in question has received the name of aristotype, and is manufactured on a large scale by Dr. Liesegang, of Dusseldorf. In the vestibule already referred to we find specimens of coloured collotype work, by Herr Lowy, of Vienna; G. Angerer and Goeschl, and G. Jaffe and Albert Bruckmanns, of Munich, have a large frame of lichtdruck specimens, both plain and coloured. We have not made reference in detail to the photo-mechanical work which Boussod, Valadon, and Co., have contributed, but we may almost look upon this firm, the successors of Goupil and Co., as belonging to our own country, their work being so well known and, let us add, appreciated. A word may be devoted, however, to an excellent *facsimile* of a water colour by Wyllie, produced by what is called chromo-photogravure. The original (2,320) and the *facsimile* (2,314) are placed alongside each other for purposes of comparison. We will conclude this somewhat rambling notice by calling attention to the excellent specimens of collotype furnished by Carlos Relvas, the greater number of which are to be found placed close together in the vestibule.

## CHAPTERS IN ELEMENTARY PHOTOGRAPHY— A GUIDE TO BEGINNERS.

BY W. M. ASHMAN.

### SECOND ARTICLE.

THE first question a novice has to consider is that of the kind and quantity of apparatus he will be likely to require at the outset. Fortunately, this is an easy matter to determine, owing to the great variety of more or less complete sets provided by dealers to suit the pockets of customers. As the articles included in each, for a specified sum, are pretty much the same, there is hardly any necessity for troubling whether one shopkeeper gives better value than another at the special price. The possession of affluent means, or the reverse, must be the guiding feature in making one's selection; but it is well to bear in mind that the best tools are by no means inexpensive, although very often the cheapest in the end. Moreover, good tools are a wonderful assistance towards the production of excellent work. To enter into a minute description of each part of a so-called complete set or sets would lengthen these articles unnecessarily, without adding a proportionate amount of interest thereto. Besides, buyers of the various advertised outfits can obtain a good deal of information and instruction in the method of using such apparatus as, in many instances, will serve to be a sufficient guide to manipulation. The following list indicates the articles usually comprised in a cheap set costing £10 to £12, and designed to produce photographs of half-plate size.

Folding bellows-body camera, fitted with swing-back, rising and falling front, reversible back for taking subjects either way on the plate, focussing adjustments, and one or more double dark slides.



Single landscape lens, flange, diaphragms, and exposing shutter.

Canvas case for camera.

Folding tripod stand, metal top, with mill-headed screw for securing camera.

Head-cloth for focussing, and compound focussing eye-piece.

Box of one dozen dry plates.

Printing-frame and vignetting glass.

One dozen pieces of preserved sensitized paper.

Developing tray.

Toning tray.

Fixing tray.

Washing tray.

Scales and weights.

Three inch glass funnel.

Fifty circular filtering papers.

Plate glass cutting shape and trimming knife.

Graduated glass measures.

Ruby lamp to be used when developing.

Pamphlet containing hints to beginners.

Small stock of concentrated developers.

Small stock of ammonia or chrome alum (antidote against frilling).

Small stock of sodium thio-sulphate (hypo. for fixing).

Small stock of gold toning bath for prints.

Dusting brush, chamois leather, and case fitted for reception of the foregoing apparatus, &c.

It will be seen by scanning the list of articles above enumerated, all of which are essential, that anything like a working set of apparatus cannot be purchased for a few shillings. Even that chosen as an example contains a lens only suitable for landscape work on a tolerably bright day, a function it performs as satisfactorily as a higher priced instrument; but should we desire to delineate subjects of an architectural character, in which perhaps greater rapidity, and certainly rectilinearity, would be a desideratum, then a lens of the type termed "rapid rectilinear" would prove of greater service, and a camera readily adjustable to either a long or short focus is to be preferred.

From the historical work of M. Victor Fouque's "La Verite sur l'Invention de la Photographie," we learn that Joseph Nicéphore Niepce took the first photograph by means of a camera, the instrument used upon that occasion being a rectangular box measuring six inches each way, and furnished with a telescopic tube containing a lens. From that period of history—the year 1816, since which date such important discoveries in photography have been made—the method of constructing cameras has undergone much improvement, until at the present time we appear to have reached a stage of complexity more puzzling than useful.

The camera in its most simple form, as shown in Fig. 4

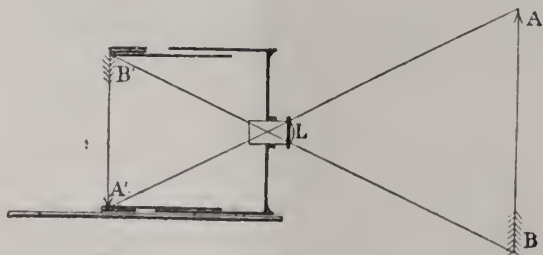


Fig. 4.

consists of two boxes, one sliding within the other, in order that the distance of the focussing screen from the lens L may be lengthened or shortened as required. An object at a distance of several feet from the lens reflects an inverted image upon the ground glass screen, more or less distinct, according to the accuracy of adjusting the focal distance. This principle is dominant in all cameras,

but the sliding box is now replaced by a collapsible bellows body, built concertina-fashion which, besides reducing weight to a minimum, effectually prevents light entering into the interior of the camera by way of the sliding portion, as shown in fig. 5.

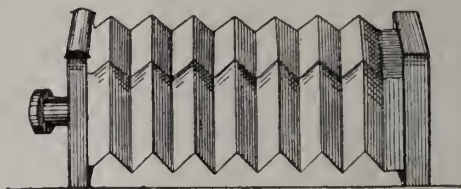


Fig. 5.

The choice of camera having been made in accordance with previously-mentioned conditions we will proceed to consider details concerning such an instrument. As for example, a camera illustrated in the advertising columns of this journal. The first step is that of cutting out a circle in the front board large enough to admit of the lens flange, and centrally placed in relation to the middle of the ground glass focussing screen. Fix securely with screws, which, to obviate the chance of protruding and thereby impeding the action of the sliding front, should not be of greater length than two-thirds the thickness of the front itself. Into this metal flange the lens is to be screwed, and the simplest way to do this is to insert the tube as far as it will go, then turn the reverse way until a click denotes the finding of the proper thread. The lens should next be covered at the diaphragm slot and the outer end of the tube, the camera racked out to its full capacity, and the whole removed into sunlight for inspection of mechanical defects. To do this effectually, open the frame containing ground glass focussing screen, cover the back with opaque cloth, and inserting one's head beneath, so that no light can enter, examine the interior of the camera most critically, to ascertain whether it be absolutely light-tight, remembering that a small pinhole admitting light is capable—as we have seen in the last chapter—of producing an image at some point or other where it is not wanted, and also bearing in mind that a larger aperture would impair the brilliancy of the work and possibly destroy it altogether by yielding none but foggy negatives. Having seen to this very important detail it may be as well to notice whether all the sliding parts act freely or not, for should this not be the case, the possibility of an awkward hitch may at any time occur, and disaster supervene as a consequence. To avoid mishaps from such a cause, the grooves and sliding portions should be thoroughly lubricated with solid paraffin or a lump of hard bees wax, when they will be found to travel with a minimum of friction, which is an advantage very much to be desired.

The next thing to be ascertained is whether the ground surface of the focussing glass at the time of focussing coincides with the plane occupied by the front of a sensitive plate in the double dark slide, when the latter replaces the former, as in making a camera exposure. Should this not be the case, an imperfectly-defined negative image may be anticipated. Therefore, supposing much care has been observed in focussing a picture, and the resulting negative is deficient in distinctness, then the distance from lens, camera-front, or other convenient point, to the focussing screen and plate in dark slide—both *in situ*—should be accurately measured, and if they do not agree, owing to the wire corners becoming bent, or the grooves being of an unequal depth, they should be made to do so. Hardwick, in his instructions, "How to test the correctness of the camera and lens," says:—"Suspend a newspaper or small engraving at a distance of about three feet from the camera, and focus the letters occupying the centre of the field (fig. 6); then insert the slide, which is a square of ground glass substituted for the



ordinary plate (the rough surface of the glass looking inwards), and observe if the letters are still distinct. In place of the ground glass, a transparent plate smeared with

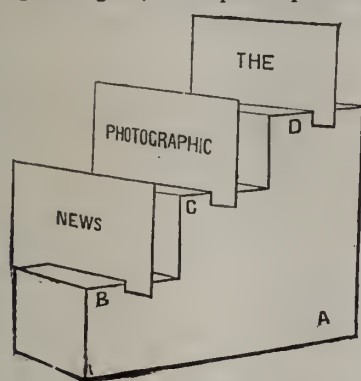


Fig. 6.

glazier's putty may be used, but the former is preferable."

"Another method, more simple than the last, is to gauge the slide with a strip of card. Begin by inserting a glass plate in the slide, and then lay it down upon the table side by side with the focussing glass. Raise the door of the slide, and having applied a flat rule, measure the exact distance between the edge of the rule and the surface of the glass plate. Now place the rule upon a corresponding portion of the focussing glass, when it will at once be evident whether the two planes coincide."

This point having received attention, and corrections made, if necessary, the camera may be attached to the stand procured for that purpose. The learner should then make himself acquainted with the position of clamping screws, and other means of fastening his camera firmly as regards sliding and swing motions as well as to the stand.

## LAW FOR PHOTOGRAPHERS.

BY S. J. DEBENHAM, SOLICITOR.

### CHAPTER IV.—(Continued.)

#### *Relations with Neighbours and the Public—Party Walls.*

A WALL separating adjoining houses belonging to different owners is called a party-wall. Disputes as to the ownership of these walls are of frequent occurrence; and the question becomes of importance when it is remembered that the ownership of the wall, or rather the occupation under the owner, involves the liability to keep it in repair.

It is the duty of the actual occupier of land to repair the fences and party-walls; and if he fails in this duty, any person injured by his neglect of it, including his landlord, may maintain an action for damages.

If it appears that the wall was built at the joint expense of the two proprietors, and half its thickness be on the land of each, the property of the wall follows the land on which it stands, and the two proprietors are not tenants in common of the wall; but half belongs to one, and half to the other.

The common use, however, of a wall separating adjoining lands, belonging to different owners, is *prima facie* evidence that the wall, and the land on which it stands, belong to both parties in equal moieties as tenants in common.

Regulations as to these walls in the metropolis will be found in Part III. of "The Metropolitan Building Act, 1855, 18 & 19 Vict. c. 122," but having referred the reader to this I should be chargeable with diffuseness if I pursue the subject further.

By the way, it is desired, while avoiding this, to give compendious information, and I shall be glad to receive hints from readers as to any subject they may wish treated, that I may take it in its due course.

## CHAPTER V.

### *Partnerships and Goodwill.*

A partnership between two or more individuals for the purpose of trade, may be created by word of mouth, unless the agreement be for a longer term than a year; when, under the Statute of Frauds, before referred to, it must be in writing. But although such a verbal agreement would be invalid, it has nevertheless been held that though a contract be made which may not be capable of performance within a year, yet an agreement between one person and another to share in the profits of a given undertaking, is not such an agreement as the Statute requires to be in writing, but may be proved by parol evidence.

A partnership is usually constituted, as between the individuals themselves, by an agreement between them to share the profits and losses of their undertaking. This may be limited to one transaction. A partnership is thus created, although the share be unequal. But it does not follow that each party has a direct interest in or claim to the capital, or any share of it; or even a right to any definite aliquot part of the profits.

A person may, on entering into a partnership, stipulate that, as between himself and partners, he shall not be liable for the losses of the business, and, on the other hand, a participation in profits does not create a partnership as between the parties if the facts negative any intention or agreement that it should so operate.

The loan of money from one to another on agreement, securing the repayment with interest, and a covenant that the lender should have a share in the profits of a trade which was conducted in partnership with a third person, but should not be liable to losses, was held not to constitute a partnership.

The above remarks apply generally to the position of affairs between the parties themselves. But a man may so behave as to render himself liable to outsiders as a partner.

One of the greatest judges on points of mercantile law, Chief Justice Tindal, said, in the case of *Pott v. Eyton*: "Traders became partners between themselves by a mutual participation of profit and loss; but as to third persons they are partners if they share the profits of a concern; for he who receives a share of the profits receives a part of that fund upon which the creditors of the concern have a right to rely for payment, and is therefore to be made liable for losses, though he may have expressly stipulated for exemption."

And this doctrine was followed in a later case by Chief Justice Wilde, and it seems consonant with common sense.

One who, without having an actual interest in the profits of a concern, or being in reality a partner, allows his name to be used, or agrees that it shall be continued, is a nominal partner. Such a person is clearly liable to the world as a partner, wherever transactions are entered into on the supposition that he is so.

And a representation by one person that he is partner with another, will create responsibility by the person making such a representation, as a partner, to anyone who gave credit to the firm on the faith of such representation. There is no liability as a partner where there is neither a participation of profits, nor any use made of the party's name to obtain credit.

An Act of Parliament was passed to amend the law of partnership (28 and 29 Vic., 86), generally called Bovill's Act, to enable persons to lend money to, or share the profits of a trade or undertaking, without being consequently made liable as partners, but it will not be safe to trust merely to the words of this Act. Many arrangements have been attempted under the Act, with the view of escaping liability, but the highest authority on partnership, Mr. Lindley (now Lord Justice Lindley), says: "Agreements intended to secure the benefit of the Act to lenders of money are constantly framed with all sorts of clauses, which expose them to the risks they are so anxious to avoid."



Let me advise photographers, intending to enter into partnership, to do so under a proper deed or agreement. This should comprise the following clauses:—

1. Nature of business to be carried on.
2. Duration of partnership and (if desired) option of giving notice to terminate, and terms of dissolution on such notice.
3. Style or name of partnership.
4. Place of business.
5. Definition of capital of partnership.
6. Regulation as to bank and banking account and drawing cheques.
7. Rent, repairs, taxes, insurance, salaries, &c.
8. Shares in profits and drawings by each partner.
9. Time to be devoted by each partner.
10. Regulation as to the keeping of books of account and custody and access.
11. Appointment of periodical days of taking accounts of capital, liabilities, and profits, and division of the latter.
12. Provision for settlement and division on death.
13. Power to dissolve in case of sufficient cause by notice.
14. Provision for settlement of affairs and division on dissolution of partnership by effluxion of time.
15. Provision for reference to arbitration in case of dispute.

Other clauses can be added as to hiring and discharging servants or clerks, becoming surety or security for third persons, &c.

The proper document is an indenture under seal, which must be adequately stamped; and here I may mention that an act has lately been passed as to stamp on deeds, which, though communicated by Government only to the profession and the press, and perhaps a few others, ought to be generally known, inasmuch as many persons get their own documents stamped.

Regulations under the Act, enact:

- (a) Instruments are to be stamped within thirty days of execution, instead of two months as formerly.
- (b) The penalty for non-stamping is £10.
- (c) The period within which the Board of Inland Revenue are empowered to remit or reduce the penalty is reduced from twelve months after execution to three months.

The Act is called the Customs and Inland Revenue Act, 1888.

I need hardly observe that the most perfect good faith should be maintained between partners, though a departure from it does not always meet its penalty.

A case occurred where the plaintiff and defendant, being partners as salt merchants and brokers, mutually covenanted by the partnership articles to diligently employ themselves in the business, "and not to engage, directly or indirectly, in any business, except upon the account and for the benefit of the partnership." After the expiration of the partnership by effluxion of time, the plaintiff discovered that, during the partnership, the defendant had been engaged in another business as a salt manufacturer, in which he had made profits.

A claim was made by the plaintiff to compel the defendant to account to the partnership for such profits, and an action by the plaintiffs claiming that the defendant's interest in the other business formed part of the partnership assets were both dismissed.

The ground of this decision was that there was no covenant to account to the partnership for any profit so made. But if the discovery had been made during the partnership, the breach of duty might have been restrained by injunction, and would have given ground for a dissolution.

This was the judgment of one of our greatest judges (Jessel), and was confirmed on appeal.

A person who is partner in a firm is liable just as if he were carrying on business on his own account alone to all the creditors of the firm to the full extent of his means.

He may be held liable even for the fraud, negligence, or other wrongful act of his partner or clerk in connection with the business.

Where a judgment is obtained against a partnership, the property of the firm, and also the separate property of each of the partners, may be taken in execution; and the judgment creditor is not bound, in the first place, to exhaust the property of the firm—he may resort at once to the separate property of the partners, or any of them. And, on the other hand, the goods of the firm may be taken in execution for the private debts of a partner.

This is not "light reading," but I hope I need not apologise for being explicit.

A partner cannot maintain an action at law against his partner during the continuance of the partnership, but he may proceed in equity, as presently mentioned, if he has ground of complaint, and should then seek a dissolution.

The general rule is that the act or contract of one partner in the course of the partnership business, binds the firm, being the contract of the firm, even though it be contrary to the arrangement between the partners themselves.

Any one member of a trading partnership may therefore bind his partners by drawing, accepting, or endorsing a bill of exchange or promissory note; also by (1) receiving money for the firm, (2) releasing debts due to it, (3) borrowing money for partnership purposes. He may also sell or pawn the partnership effects, and though the goods sold be bought on credit and not paid for, the firm will be liable to the vendor. But one partner cannot, as a general rule, bind the firm by a guarantee, or by a submission of matters in dispute to arbitration, or by executing a deed secretly, except it be a release.

A partnership is dissolved by death, or by bankruptcy, or insanity; and of course it may be dissolved as provided for by the deed, or by mutual consent. It may also be dissolved by the Court, if the business it was formed to carry on be found impracticable; or on complaint and proofs of fraud, or other gross misconduct of one of the partners. And application should also be made to the Court in the event of insanity.

A dissolution should be advertised in the *London Gazette*, and unless this be done the retiring partner is not exonerated from claims on the part of anyone who has no notice of the change if the name of the firm be preserved.

#### *Goodwill.*

On buying or selling a business, an essential point is the goodwill. The transfer of this necessitates an engagement on the part of the vendor not to carry on or be engaged in a similar business, and almost anything which the parties may choose to stipulate as regards this matter will be enforced by law as against the vendor. There must be, however, an express and definite covenant by the vendor not to carry on similar business within certain limits for a given time. But it will not be safe to prohibit a man for ever from carrying on his trade in Britain. This would be against public policy, being in restraint of trade.

I have given some account of this doctrine in a previous chapter, as applicable to the case of a servant. Where a covenant of this kind was divisible into two parts, one of which was legal, and the other not, the Court would formerly assist a person complaining of the breach of it by giving a judgment in his favour on that part of the clause which it could uphold, so as not to hold the agreement void altogether; but a case just decided by Mr. Justice Chitty, referred to in Chapter III. (*Baker v. Hedgecock*, 29th May, 1888), must be closely looked at in considering this point.

A more complete (though not a full) report of the case has now been published, which I extract from the *Solicitor's Journal*.

"The plaintiff, a tailor in Holborn, moved for an *interim* injunction to restrain the defendant from infringing an agreement whereby, on being employed by the Plaintiff as foreman-cutter and general superintendent, he agreed



not to enter into ANY ENGAGEMENT OR BUSINESS WHATSOEVER within a given distance and period of time. The notice of motion was confined to asking for an injunction to restrain the defendant from carrying on the business of a tailor within the prohibited limitations, and the plaintiff relied on a case he cited (*Barnes v. Geary*), as an authority in support of the proposition that the Court should enforce such a covenant as far as it was reasonable.

"Chitty, J., said that the agreement, if read in its strict language, was obviously invalid, as in general restraint of trade; but it was contended that the Court should break it up and read it as if the words were not to carry on the business of a tailor, or any other business. To so divide up the covenant as to escape making void the covenant was, however, against the rule laid down by Willes, J., in *Pickering v. Iffracombe Railway Company*. It had been contended by the plaintiff that *Baines v. Geary* was in his favour. It, however, appeared to his Lordship that the covenant there was divisible in two parts, and that North, J., was in fact adopting the rule enunciated by Willes, J. To accede to the plaintiff's contention would create a new covenant in lieu of explaining an existing covenant. The motion was dismissed with costs."

The remedy for breach of covenant as to carrying on business is by action for injunction and damages.

Frequent disputes arise between the vendors of businesses and the purchasers of them, in consequence of the disappointment suffered by the latter in regard to the extent of the business sold. Various reasons may explain the apparent or actual falling off of the receipts; and particularly in a business such as a photographer's, does the prosperity of the concern depend on the personal qualities of the buyer or successor. His appearance, manners, and deportment have to be taken into consideration, not less, perhaps, than his manipulative skill, business capacity, and artistic faculty.

Hence, possibly it is that the value of the goodwill of a photographer's business is probably not so great in proportion as that of some other trades or professions of equal importance.

Books can be examined before the purchase is concluded, and if this be not done the Court will be unwilling to listen to allegations of misrepresentation more or less loosely made. Such actions are most uncertain in result, and among the most hotly contested. They are constantly occurring with reference to public-houses, and there have no doubt been some very gross cases of this kind.

These remarks apply with equal or greater force to the payment of a premium for a share in a business—i.e., a partnership.

If a goodwill be purchased the vendor must bear in mind the liability incurred by permitting his name to remain in the business above referred to.

#### A NEW DEVELOPER—HYDROXYLAMINE AND PYRO.

BY DR. CH. L. MITCHELL.\*

WITHIN the past few months considerable attention has been directed in photographic circles to hydroxylamine, a new chemical, and claimant for a position in the ranks of the developing agents. Attention was first called to it by Professor Eder, in *Dingler's Journal* for 1887, p. 225, who recommends the following method for its use:—

(A) Hydroxylamine chloride 1 part, dissolved in alcohol 15 parts.

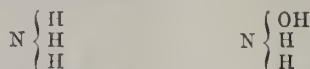
(B) Caustic soda 1 part, dissolved in water 8 parts.

For use, mix 3 to 5 parts of A, and 5 parts of B, with 60 parts of water. This formula, however, when tested by other observers has been found to be very unsatisfactory, the powerful action of the caustic soda causing blistering and reticulation of the gelatine film of the photographic plate; while, if a weaker alkaline combination is used, such as the carbonate, no image can be evolved.

\* Read before the Philadelphia Photographic Society, June 6th, and extracted from the *American Journal of Photography*.

In the January number of *The American Journal of Photography*, Mr. J. G. Cassebaum, a member of this Society, called attention to the value of hydroxylamine in combination with pyro. as a developer, not only for negative plates, but also for transparencies and lantern slides, claiming that it produced a wonderful clearness in the shadows and brilliancy in the higher lights, and gave a beautiful bluish-black tone, rich in gradations, and soft and pleasing to the eye. The addition of hydroxylamine to the developer also acted as a preservative, keeping the pyro. solution clear and active for a long time. Mr. Cassebaum's results have been corroborated by Mr. H. G. Stebbins, of New York, in a paper published in *Anthony's Photographic Bulletin*, p. 141, 1888. While I, therefore, cannot claim anything particularly new for the subject I propose to discuss this evening, I desire, briefly, to show what can be done with this new agent, and to offer a few suggestions for its proper use. Before going into further details, however, let us look for a moment at the chemistry of hydroxylamine.

Hydroxylamine, represented by the formula  $\text{OH}, \text{NH}_2$ , is a combination of hydroxyl (OH) the radical of water, and the univalent radical amidogen ( $\text{N H}_2$ ). It was discovered by Lossing, in 1865. It is a very volatile and easily decomposable base, and can be obtained only in solution. It is formed when ethyl nitrite is acted upon by tin and hydrochloric acid, or by the action of hydrochloric acid on tin and ammonium nitrate; also by the action of sodium bisulphite and nitrite of sodium with solution of potassium chloride. Hydroxylamine is really an ammonia in which hydroxyl (OH) has been substituted for one atom of hydrogen.



It forms definite salts with the acids, and its combination with hydrochloric acid, hydroxylamine chloride, is the salt which has been used in recent experimentation.

Hydroxylamine chloride is found in commerce in the form of beautiful, colourless, transparent tables, very much resembling nitrate of silver crystals, only possessing rather a more waxy appearance. It is quite soluble in water, moderately so in alcohol, and although more stable than its base, is still gradually decomposed by the action of light and air, and hence should be kept in a closely-stoppered bottle and excluded from the light. Its photographic value resides in its avidity for oxygen, it breaking up again into water ( $\text{OH}_2$ ) and hydrochloric acid. It is a great reducing agent, and hence is especially valuable for photographic work. There are several makes of hydroxylamine chloride at present in the market, some of which are much discoloured and impure. I am indebted to Mr. F. H. Rosengarten, of Rosengarten and Son, for that which I have used in my experiments, and have found it to be very pure, and of excellent quality.

When combined with pyrogallol, hydroxylamine chloride exerts a double action: first, by its absorptive capacity for oxygen it serves to partially protect the pyrogallol from decomposition, and secondly, when mixed with the alkalies or their carbonates in the process of development, a certain quantity of chlorine is liberated, which combines with a certain proportion of the alkali to form an alkaline chloride, which salt exerts the same retarding influence on the development as do the alkaline bromide salts. It is even probable that its action may be better than that of the bromides for preserving detail and keeping the shadows clear, as the quantity of the salt formed is quite small; its action takes place gradually and progressively, and the chloride formed is in a nascent condition when its modifying influence is exerted.

During the past two months I have made a quite extensive use of this combination of pyrogallol and hydroxylamine chloride, not only as a developer for negatives, but also for developing transparencies and lantern slides, and I can fully corroborate the excellent results which have been obtained by the gentlemen previously mentioned. As an "all-round" developer it excels anything I have ever used, and is equally good for negatives or positives. It works with sufficient slowness to admit of the finest detail being obtained, and gives the most beautiful, clear shadows, and brilliant high-lights. It seems almost impossible to fog a plate in development when this mixture is used, and I have carried on development for a half-hour, and until the back of the plate was almost as dark as the front, and yet, after washing and fixing, the negative or positive would be very dense, of course, but still very clear and brilliant.



The formula I have used is a slight modification of that recommended by Mr. Cassebaum, and is as follows :

No. 1. Hydroxylamine chloride ...	30	grains
Pyrogallol ...	240	"
Water ...	1	pint.
No. 2. Sodium carbonate, crystals ...	1½	troy ounces
Sodium sulphite ...	4½	"
Water ...	1	pint.

To develop, take of No. 1, from one to two fluid ounces, No. 2, one-half fluid ounce, water four fluid ounces, flow over the plate, and if the image does not appear within 30 to 40 seconds, add more of No. 2 solution, in small portions at a time, until development commences. This is only offered as a general outline of the method of development, for each plate must form a study by itself, according to character of subject, time of exposure, &c., and the above proportions varied accordingly. No iron-clad system can be laid down for this.

The use of the sodium sulphite in this formula seems to be mainly in preventing the discolouration of the liquid during development. It may also act as a slight retarder of the chemical action, but such action is very slight. It does, however, materially affect the colour of the liquid, for when a solution of the sodium carbonate alone is added to the pyro. mixture, the liquid darkens very rapidly, much more so than when the sulphite is also used. With the latter mixture I have developed a dozen lantern slides, using the same developer for all, and after the last plate was finished the developer was but of a moderately light orange colour. The mixture of the pyro. and hydroxylamine chloride seems to possess remarkable keeping qualities. This bottle which I now show you contains a mixture made up two months ago, and as you see, it is not as yet very dark, although it has been exposed to a strong light, and is, as I found out by testing it to-day, fully as active as when it was first made up. I am inclined to think, although as yet I have not had the opportunity of practically testing it, that the mixture will keep still better if the sodium sulphate is mixed with the pyro. and hydroxylamine salt, instead of being added to the sodium carbonate. I shall try this combination shortly, and report its results to the Society at some future time. A point here which I wish to make in regard to keeping not only this but all other pyro. mixtures, is the use of amber glass bottles and rubber corks, instead of the ordinary white flint bottle with a wooden cork. The amber glass prevents the actinic rays of light from penetrating to the contents of the bottle, and the rubber stopper is much superior to the woody cork, which soon blackens, rots, and contaminates the liquid which it confines.

A few months ago I had the pleasure of calling the attention of the members of this Society to a method of silver printing on plain paper, by which very beautiful results could be obtained. To attain the best results, a negative is needed which possesses considerable "snap," as it is technically termed, and this pyro. and hydroxylamine developer produces the best negative for making the prints of any developer that I have yet used. The contrasts of light and shade are beautifully brought out, and while perfectly clear, are still soft and pleasing.

In conclusion, as "the proof of the pudding is in the eating of it," I beg leave to submit for the inspection of the members, this evening, several negatives made with the developer, a series of plain silver prints made from them, and also a number of lantern slides developed with hydroxylamine and pyro. These will illustrate in the most practical way the character of work which this new developer is capable of, and I trust may serve to interest other members in still further "developing" the merits and uses of this valuable agent. One series represents a negative and a lantern slide from the negative, both developed with the same combination of hydroxylamine and pyro. I also show a lantern slide of the same subject prepared with a hydroquinone developer for purpose of comparison.

### Notes.

The American *Photographic Times* reappears, we are glad to say; but perhaps, hardly up to the old standard of excellence, if we may judge by the following commencement of the first article in the number just to hand :--

"You asked me to write somethn g. I answered that with

me there was nothing new, excepting my old craze on the stereoscope, now thoroughly revived after slumbering for nearly twenty years; but of this I have nothing to add to that which I have written within the past two years and already published by you in both journal and annual. If the following, in its somewhat peculiar form, meets any existing want, use it; under no circumstances return it. Always keep cloth used for focusing over the plate shield when withdrawing the slide and when returning it after exposure of plate. Many a plate will be saved from being light-struck by this simple precaution. I make it a rule to keep the cloth permanently over the camera as well, when in the bright sunlight. Always keep camera level, otherwise architectural objects pitch to or from you. Always use the largest diaphragm or stop that will give proper definition or 'sharpness' to the picture. A very small diaphragm tends to render the negative flat, lacking brilliancy and snap. Always keep the camera clean and free from dust on the inside as well as the outside. Particles of dust floating about inside of the camera are likely to settle upon plate during exposure, and in development produce white or transparent spots; observe the same rule as to plate-shields. Dust is one of the photographer's greatest enemies, and all the more dangerous and troublesome because it is unseen. Always dust plates before putting in plate-shield."

Burnett's "Art Essays," and Wilson's "Quarter Century in Photography," both of which have recently been reviewed in the *PHOTOGRAPHIC NEWS*, are now kept in stock by Marion, of Soho Square, the price of each volume being 16s.

The formula recently given in the *Photographische Archiv*, for a protective coating applicable to negatives, either on collodion or gelatine, merits attention, especially as with a water varnish of this character, there is no need to dry the plate before the application of the protective coating. To prepare the mixture one dissolves 8 parts of borax and 2 parts of carbonate of soda to 160 parts of hot water, and in this is dissolved 32 parts of bleached shellac, broken up small; next add one part of glycerine and 160 parts more of water. Any deposit which forms after a few days, can be filtered out, and as before stated, the negatives can be treated while wet; either by flooding or by immersion, after which the excess is drained off.

How can I restore a faded silver print? This is a question very often asked; and perhaps when the print has only become yellow, the best thing to do is not to attempt restoration, but merely to photograph the print by means of the camera, as the yellow parts come out much darker than they appear to the eye.

Those who intend to exhibit photographs at the forthcoming Exhibition of the Amateur Photographers' Club in Vienna, should apply at once to Schenker and Co., of 64, Moorgate Street, London, who will receive applications until August 1st. The firm above mentioned will not only receive the photographs, and transmit them free of cost to Vienna, but also deliver them up to the owners, free of cost, after the termination of the Exhibition.

Dr. Julius Schnauss' handbook of "Collotype and Photo-



lithography," has been favourably noticed in our columns, and we are glad to be able to state that an English translator will shortly appear. E. C. Middleton is the translator, and the work is to be issued by Iliffe and Sons, of Coventry and London.

Although the new County Government Bill is by no means certain to pass into law this session, there seems to be a general impression about that the days of "Quarter Sessions" are fated soon to be ended; and, by way of reminding the county magistrates that their days are virtually numbered, or so far as they constitute the county authority, that is to say, at least one enterprising photographer, eager to seize time by the forelock, has been sending round a circular suggesting that it would be interesting to secure a photographic representation of what may be the last, or one of the last, meetings of the county magistrates in their official capacity before being superseded by Mr. Ritchie's new County Councils.

It is much the same spirit which now leads nearly every local mayor who has gone to the expense of procuring himself a scarlet befurred gown of office, to have himself photographed in that state garment before his mayoralty is at an end.

Amongst the effects left behind him by the notorious "Harry Benson" is said to be a large collection of photographs consisting of portraits, views, &c., all of them being more or less closely associated with the sensational and romantic life of this clever scoundrel. To the initiated, in fact, these photographs constitute a sort of illustrated life of the deceased swindler. Thus he has carefully preserved a series of views not only of the Shanklin villa he made so notorious, but of several other "genteel residences" he occupied from time to time. So voluminous, too, is the collection of the portraits—and of ladies, too, occupying a recognized social position in the Isle of Wight, and elsewhere—that their publication would cause quite a flutter in our social dove-cotes. There are other photographic likenesses which, in the opinion of the New York police, may even now prove of use in identifying some of the hitherto unknown confederates with whom the late Harry Benson was in league; and it may prove all the better for the community after all that this ingenious rascal's pride so far overcame his prudence as to lead to the keeping of "negative" evidence it would have been much safer to destroy.

The photographer had the advantage of the anthropologist at the removal last week of the remains of Beethoven to their new resting-place, in the central cemetery of Vienna. When the coffin was opened the skeleton remained on view for about ten minutes, during which the anthropologist had an altercation with the officials, who refused to let him take some measurements and a plaster cast of the skull. The anthropologist had to return discomforted, but the photographer, without saying anything to anybody, secured a photograph during the squabble. Whether the official, when he discovered what the photo-

grapher had been doing, raised any objection, we are not told. Anyway, the objection would have been too late.

Country people have strange ideas as to the power of photography. A Burslem photographer, the other day, received back a proof from a customer with the instructions that he was to do half-a-dozen with the coat buttoned, and half-a-dozen with the garment unbuttoned, the same as the proof!

Military authorities evidently regard the amateur photographer as a wolf in sheep's clothing. To be found wandering near a fortification armed with a camera is quite sufficient proof that the photographer is a spy. Explanation is useless, and any attempt at justification only makes the matter worse. This was the experience of Mr. Fincham, an Englishman, who a week or two ago strolled upon an eminence at Nice, which commanded a view of the fortifications. Mr. Fincham unluckily had a camera in his hand, and when an astute sentinel beckoned him in, he unwittingly fell into the trap, and the result was that he was arrested; and despite passports and other evidence of respectability, had to endure sixteen hours in a cell clad in a prison dress. Mr. Fincham seems to think that the sentinel treated him unfairly because he signed to him to come on instead of motioning him away, but surely this is unreasonable. One might as well expect a policeman to warn a pickpocket!

In time we suppose amateur photographers will learn wisdom in this respect, for it is pretty certain the prohibition of photography in the neighbourhood of fortified works will become the universal rule. One would have thought that Cape Town, for instance, would not be very sensitive as to its fortifications, yet we hear of a measure being introduced into the Cape Parliament, preventing the making of drawings or photographs of defensive works. Why amateurs persist in going near fortifications we cannot understand, for there is rarely anything of the picturesque about them!

## Reviews.

THE PHOTOGRAPHER'S NOTE-BOOK. By Sir David Salomons. Price 1s. (*Marion and Co., 22, Soho Square.*)  
HERE we have a small book in limp covers, which is suited either for the pocket or for the camera case, and in it are to be found numerous items of information; also tables of exposure and blank forms for recording work.

WOOD TRAY WITH RUBBER CLOTH BOTTOM. (*Marion and Co., 22, Soho Square.*)

AN excellently-designed and well-constructed tray of "clean" and dry pine wood, well saturated with varnish. This is one of the best wooden trays we have seen, and we understand that it forms one of a series including all the current sizes. The advantage of wooden trays for such purposes as washing, toning, and fixing considerable numbers of prints, can best be appreciated by those who in quick working have broken several of the large and expensive earthenware dishes.



### VOIGTLANDER'S NEW WIDE-ANGLE LANDSCAPE LENS. (Marion and Co., Agents.)

THIS instrument consists of but two glasses, a double convex crown cemented to a double convex glass of a new glass, having some of the characteristics of the old flint glasses. Both glasses are, in fact, new materials from the Jena factory, and though light they possess great dispersive power in proportion to the index of refraction. The instrument sent to us for notice has a diameter of 2 inches, an equivalent focus of a little over 11 inches, and well covers a 12 by 10 plate. The field is very flat, and the distortion at the margin is about the same as in the case of the ordinary view lens, but with the enormous advantage of a wide angle.

The lens performs very satisfactorily indeed, and is excellently adapted for general instantaneous view work, on account of the great brilliancy and equal illumination of the image. Moreover, the price is low, and we may expect this form of lens to be largely used out of doors during the present summer.

### THE ECLIPSE CHANGING BAG. (F. Beresford, 16, Rockwood Street, Nottingham.)

THE dark tent in its various forms is coming on the market rather abundantly, not only for the mere changing of plates, but also for the development. That before us consists of a light-tight bag, with two arm-holes, each of these being furnished with two expandable constrictions. The weight is only half-a-pound, and it serves very well for quarter-plates.

### THE REPRODUCTION OF NEGATIVES.

BY W. H. RAU.\*

COMPARATIVELY few photographers seem to appreciate the value to be derived from the successful working of a process for the reproduction of negatives. Many believe a reproduction cannot be made to equal the original. My experience has satisfied me that with care and judgment negatives can be made from others that are as good, and, in some cases, better than the original.

Supposing a rare and valuable negative is on thin glass, and needs a large number of prints made from it, and the owner will not risk the only negative he has. Neither can an edition be made ready in time for a publication. Again, a negative is too thin and flat—made in bad weather—is full of detail, but lacks brilliancy, would not care to risk an intensifier, bearing in mind the stains that may result, besides which intensifying would not make it any more brilliant. This can be reproduced, and a brilliant negative result. A small negative is to be enlarged, or a valuable negative is broken and cannot be made again. Even this can be successfully reproduced.

At different times a knowledge of how to make a negative from a negative has been of great value to me. In 1881 and 1882, during a six months' sojourn in the Orient, I duplicated all subjects made while in Egypt, but on reaching Arabia and Palestine, plates were getting scarce, and only one plate was used on each subject. Many exposures were made under unfavourable conditions in rain, cloudy weather, &c., as an itinerary had been mapped out, and a certain amount of country had to be gone over each day, and views had to be made under all conditions, good and bad.

Nearly all of these I reproduced on my return, and will show you to-night some of the results, with a print from the original plate and one from the reproduction, side by side. Only recently I came into control of a large collection of plates of India, some of which were made high up in the Himalayas, many miles from a railroad, where travel is expensive and difficult. A few of the choicest plates were cracked and broken. Some of these, which had no chipped edges, but were broken clean, I have reproduced. Sometimes a reversed negative of a choice subject is wanted for some photo-mechanical process.

Having briefly outlined where reproduction was a help and a necessity, we will take up the first part of the process—that is, the making of the positive. Having carefully studied the character of the negative, its colour, unevennesses, dense portions,

&c., carefully clean the back, and have ready a deep printing-frame, a size larger than the negative. Have in this a piece of crystal plate glass, free from bubbles and scratches. Then arrange the negatives in the centre of the frame, being careful to brush away with a blunder all filaments and grit, and place the plates to be used for the positive face down in contact with the negatives. Place a dark pad on this, and put in the back, and gently press the springs into position. All is now ready for the exposure, which I have always made with a Carbutt lantern, measuring about eighteen inches from the side of the lantern, and making a mark, using the oil lamp, as I found this the most regular and reliable, as it can be turned up to nearly the same brilliancy each time of using. The time of exposure varies of course with the density of the negatives and the rapidity of the plate used. I prefer using a slow plate for the positive, one that will develop with ferrous-oxalate, such as Carbutt's A or B plates, unless a very dense negative is to be reproduced. I have used recently on dense negatives some Belgian plates that were rapid, also a few Seeds, 22 to 25, as they develop a fine gray colour with the ferrous-oxalate. I also prefer using a plate a size larger than the negative, in this way avoiding thin edges. Should the negatives be of average good density, about 30 to 40 seconds will be the right exposure with an A plate. If one end of the negatives is thin, shade this by moving between it and the light a cardboard, cut to suit the unevenness. If certain portions of the centre are dense, cut a round hole in a cardboard and move this in front of the plate and the dense portions, and keep it in motion, giving the necessary extra exposure to bring up the detail which might otherwise be lost.

Having properly exposed the plate, mix a developer consisting of 8 parts of oxalate of potash (saturated) solution to 1 part of iron (also saturated), and 20 drops of a 20-gr. solution of bromide of potassium. The image will, of course, appear slowly, but will build up with an evenness that is essential to success; this should be continued until the image is entirely covered, even the highest lights, so that all detail in every portion of the plate is brought out; then wash and fix it as usual.

The weak developer well restrained gives a soft, even, gray image, full of detail, without too much vigour. In case a thin, flat negative is used, use an A plate, and place the frame 36 inches from the light, and expose proportionately double what it would be at 18 inches, and get as much brilliancy as possible in the development; sometimes, when the original is very flat, ending with a developer consisting of oxalate of potash 4 parts, iron 1 part, which will give it snap and vigour. Should it be the intention to enlarge the resulting negative, the positive for this purpose should be less dense than for contact use.

Having dried the positive, carefully spot out any pin-holes with a fine pointed brush, and do any other retouching the picture may need, such as strengthening dark portions, &c. Any scraping away of objects not wanted should be done on the positive, such as a crack from a broken negative.

I have with me a positive made from a broken negative, which was in three pieces, and one corner entirely gone, broken en route from India. I carefully laid the pieces together in a printing-frame and brought them in close contact, then placed the plate, a size larger than the negative, in position, and during the exposure moved the frame slowly from side to side in front of the light, to lessen any shadow which might be thrown by the crack. I placed this positive in the hands of Mr. H. Parker Rolfe, a member of this Society, who has obliterated the cracks, removed a cow which had strayed in on the edge of the picture, and filled in a corner which was a blank.

The making of the negative is next in order, and I proceed to make the exposure the same as in the positive, supposing the negative is to be the same size, and used for silver printing and ordinary purposes. Should the reproduction be wanted for use in phototyping, photogravure, or any of the processes requiring a reversed negative, then the negative must be made in the camera, placing the positive in position with the film side turned from the lens. Where enlarged negatives are intended, they must be made in the camera, with a short focus rectilinear lens, or a camera with a very long draw. Experience alone will give you the proper time of exposure. It will vary with the density of the positive, and the rapidity of the plate used. Here, as before, in making the positive, judgment should be used in measuring the distance from the frame to the light, as a dense positive can be brought to 15 inches, and a very thin one as much as 36 inches, from the light. In this part of the process I use Pyro developer in preference to oxalate, although the oriental subjects which I will show are all made, both positives and

\* Read before the Photographic Society of Philadelphia, June 8th, and extracted from the *American Journal of Photography*.



negatives, with ferrous-oxalate on Carbutt's A plates. But I find, since making them, a better knowledge of development has been gained, and the results with pyro. are surer than with iron.

I generally begin the development as if the plate were over-timed, using a weak soda and pyro. with a trifle of bromide, and adding soda or pyro. as the subject and conditions may suggest.

The development is similar to that of an ordinary exposure made in the camera. One must notice the detail, the general appearance, and progress the same, if the result is to equal an original negative. I have found that the most difficult part of the process is to secure a positive of the proper density and colour. It must be rather over-exposed and gray in colour, with all detail apparent without straining the eyes to see it. I always judge the density by daylight, and never use a positive that is yellow, as it is very deceiving in its density, and usually gives an unsatisfactory result. While I admit there are negatives that cannot be well reproduced, I believe they are the exception, and not the rule. Hardness or chalkiness is likely to occur to the beginner, as he is apt to make the positive brilliant in all cases, when really this is not necessary, excepting where a weak, flat negative is used.

Cleanliness, freedom from dust, and good judgment, combined with skill in development, are necessary to obtain the best results.

## Patent Intelligence.

### Applications for Letters Patent.

8,830. EDWARD HOLMES and WILLIAM WATSON, 22A, Church Street, Islington, London, for "Improvement in reversible holders for photographic cameras."—June 16th, 1888.

Patent on which the Fourth Year's Renewal Fee has been Paid.

9,026 of 1884. H. GARDNER. (*Sutherland*).—Plates from photographic negatives for typographic surface printing.

Patent which has become Void through Non-payment of Duty.

1,380 of 1883. R. BROWNE and others.—Gelatin reliefs and printing surfaces from pictures and photographs.

### Specifications Published.

10,103. TOM JOHN COLLINS, of 56, Cochrane Street, St. John's Wood, in the County of Middlesex, Manufacturer of photographic apparatus, for "Improvements in photographic cameras."—Dated July 19th, 1887.

The Patentee says:—

The object of my invention is to provide a new form of sliding base or holder to which the framework of the front part of the camera may be attached whereby the operation of focussing can be more readily performed, and the whole front part of the camera be firmly held at any point and in any plane on the base-board.

To carry out my invention, I fix to the base-board, parallel to each other, two strips of metal, to act as guides, along which the camera front attached to the sliding base or holder may be drawn either backwards or forwards, and to which the whole may be clamped in any desired position. This base of the camera front is made of a metal strip, on the ends of which are fixed sliding saddles or holders in such a position that they may engage the two guides on the base-board. The saddles are made with flanges bent over to the under side, and of such size that they shall fit the guides and slide evenly on them, thus connecting the camera front and base-board together.

To clamp the sliding front so attached at any desired point on the base-board, and in any plane, I make the following arrangements:—The upper parts of the sliding saddles between the flanges, have cut in them, for about two-thirds of the length, narrow slots terminated by round holes, thus making a provision for pulling the two flanges of each together. On the upper side, next the camera front near the open end of the slot, I fix with a screw or pin, a turncatch, having cut in its face an eccentric slot opposite to the other split member of the saddle, through which and opposite to the holding screw or pin, a pin is firmly fixed to the latter member of the saddle. A turncatch as described is fixed to each saddle, and by turning them in the proper direction, the flanges of the saddle are drawn firmly on to the sides of the metal strips of the base-board, thus gripping them and holding the whole arrangement firmly in position. The frame of the camera front is attached to the sides of the fore parts of the saddles by centring pins, and slotted struts for

holding it in position are attached at the rear parts of the saddles in the same way.

8,711. THOMAS RUDOLPH DALLMEYER, of 19, Bloomsbury Street, in the County of Middlesex, Optician, and FRANCIS BEAUCHAMP, of High Cross, Tottenham, in the County of Middlesex, Engineer, for "Improvements in apparatus for regulating exposures in the use of photographic shutters."—Dated, 16th June, 1887.

This invention has for its object improvements in apparatus for regulating exposures in the use of photographic shutters.

Where the photographic shutter is opened and closed by the continuous movement in one direction of a lever or driving part, we give motion to such part by means of automatic apparatus, which we can regulate so as to move either faster or slower, as may be required. We employ for this purpose a spring barrel carrying a crank pin, and this, by a connecting rod, we connect with a lever, which, in moving through a small arc, causes the opening and closing of the shutter. In connection with the lever, we provide a trigger—on pulling the trigger the lever is released, and the spring then acts upon it through the connecting rod, moving the lever from end to end of its course. To adjust the speed of this movement, we shift the joint coupling the end of the connecting rod with the lever, to or from the fulcrum of the lever. The further this joint is placed from the fulcrum the more advantageously the force of the spring is applied to effect the movement of the lever, and consequently the more rapidly the movement is performed. Where the photographic shutter is of such a construction as to require a movement of the actuating part in one direction for opening, and in another direction for closing it, we employ another arrangement.

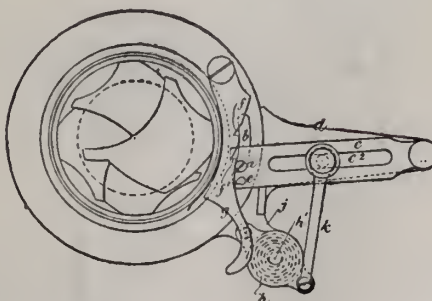
We provide an axis and a spring so applied as to rotate the axis when set free. The axis has upon it a crank pin working in a slot in a slide. The slide is thus moved to and fro. The slide has a projection upon it adapted to operate against a finger in connection with the lever which moves the shutter. The finger is moveable, and can be so set as to be within the range of the projection on the slide or to be entirely out of its way. In the first case the slide imparts to the lever the motion requisite to rapidly open and close the shutter, and immediately this is effected, the movement of the axis is arrested by an arm upon it coming against a stop pin inserted into a disc in a suitable position. When a slower movement of the shutter is required, the finger is shifted away from the slide, and brought within range of a lever, which receives a reciprocating motion from a cam wheel mounted on the same axis with the crank pin, but loosely. This cam wheel is driven at a comparatively slow speed by a pinion on the shaft, giving motion to a wheel on a counter shaft, on which there is another pinion gearing into spur teeth on the periphery of the cam wheel. As before, in the use of the apparatus, the axis is set free by a trigger, and is allowed to run for a sufficient time to open and close the shutter, which done it is brought to rest by a stop pin, as already explained, but this stop pin is now set so as to allow the axis to turn through a larger angle than in the former case.

In order that our said invention may be more fully understood and readily carried into effect, we will proceed to describe the drawings hereunto annexed.

### Description of the Drawings.

Figure 1 is a front elevation of the first arrangement, the

Fig. 1.



shutter employed being that described in the specification of a former patent granted to us dated 22nd day of April 1887, No.



5,903. It is opened and closed by the pin *a*, as it travels in one direction from one end to the other of the slot *b*. The pin *a* is embraced by a fork on the lever *c*, which is pivoted at *c'*, the pivot *c'* being carried by an arm *d*, fixed to the casing of the shutter. The lever *c* carries a pin *e*, which engages with notches *f*, *f'*, in the trigger *g*; *h* is the cover of a spring box fixed to a projection *j*, on the case of the shutter. The spring tends to cause the cover *h* to turn about the centre pin *h'*; pivoted to the cover *h* is a rod *k*, whose other end is pivoted to the lever *c*; its point of attachment to the lever can be varied, the pivot being free to slide along the slot *c''* in the lever, a thumb-nut being provided to secure it in any position. By varying the

point of attachment the leverage of the spring is varied and the time of exposure regulated.

In working the apparatus the lever *c* is swung over until the pin *e* engages with the notch *f*, the shutter being closed in that position as well as in the position shown in the drawing. When the trigger is pressed the pin *c* is released, and the spring swings the lever back again, thereby first opening the shutter and then closing it again. The notch *f'* is provided for long exposures. When the pin *c* engages this notch the shutter is fully open, and so remains until the trigger is pressed by the operator, when the spring brings back the lever, as before described, and closes the shutter. Figures 2 to 7 illustrate the second arrangement.

Fig. 2.

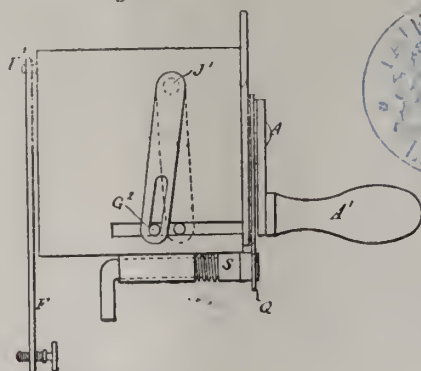


Figure 2 is a side elevation.

Fig. 3.

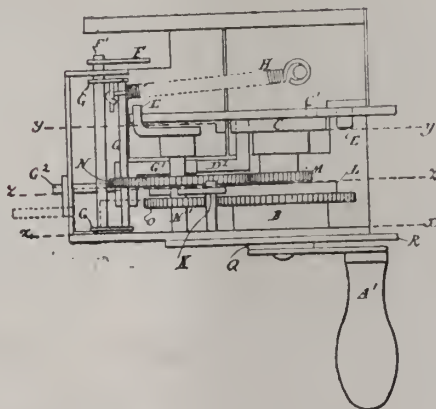


Figure 3 is a plan.

Fig. 4.

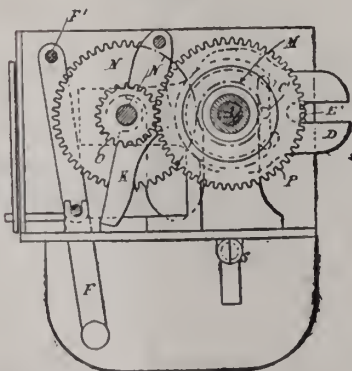


Figure 4 is a section on the line x. x. figure 3.

Fig. 5.

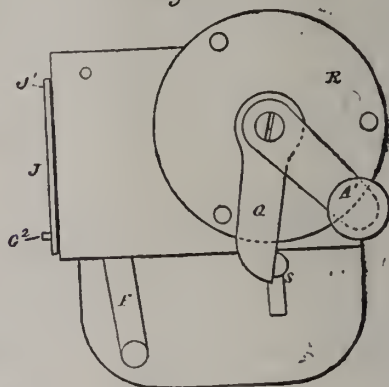


Figure 5 is a front elevation.

Fig. 6.

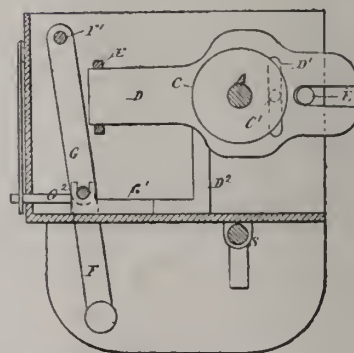


Figure 6 is a section on the line y, y, figure 5.

Fig. 7.

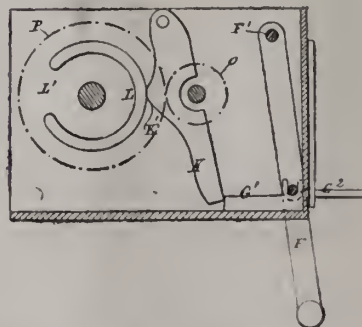


Figure 7 is a section on the line z, z, figure 5.



A is an axis which is fixed to the angle A'. B is a spiral spring tending to rotate the axis A. The axis A has upon it a disc C, carrying a crank pin C', working in a transverse slot D', in the slide D. This slide is therefore moved to and fro as the axis rotates. The slide D works in the guides E E', and carries an arm or projection D'. F is the lever which works the shutter. It is fixed to an axis F', to which is also fixed a swinging-frame G. One of the sides of this frame carries a pin, to which one end of the spring H is fixed. The spring therefore tends to keep the arm F in the position shown in figure 5.

The frame G carries a stop or finger G', which has a pin G<sup>2</sup> projecting to the outside of the apparatus. The pin enters a slot in the lever J, pivoted at J', by which the finger G' can be moved to and fro. When it is in the position shown in figure 5, it lies in the path of the projection D', which in its motion carries it with it, but it is brought back again by the spring H, as soon as it is free; the arm F is thus swung to and fro. When, however, the finger G and its pin G<sup>2</sup> are in the position shown in figure 7, and in dotted lines in figures 3 and 5, the finger G' no longer lies in the path of the projection D', and ceases to be actuated by it; it now, however, lies in the path of the swinging lever K, which has upon it the projection K', which bears against the cam L. The cam L is in the form of a broken circle (see figures 4 and 7), being continuous, except at L'. When the projection K' drops into the break L' in the cam, the lever F is free to assume the position shown in figure 5, and the shutter is closed. When the cam L begins to turn, the shutter is at once opened, and remains fully open until the cam L has performed a complete revolution (in figure 7 it is shown half way round), when the projection K' of the lever K again drops into the break L', and the lever F is free to be brought back by the spring H, and the shutter again closes.

The cam wheel L is driven by the pinion M on the spring axis which gears with the wheel N on the counter shaft N', which also carries the pinion O gearing with the toothed wheel P on the periphery of the cam wheel. The axis of the cam wheel L carries the finger Q on the outside of the apparatus. This finger, Q, forms the trigger, being retained in any position by a peg put into one or other of the holes in the face of the disc R. When released, by pulling out the peg, it revolves until arrested by the spring stop S.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

1. Apparatus in which the exposure is varied by altering the leverage of a spring upon the arm actuating the shutter, substantially as described.

2. The arrangement substantially as described and shown in figure 1.

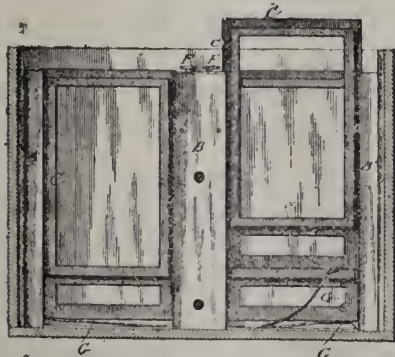
3. Apparatus for regulating the exposure in which the lever actuating the shutter is moved to and fro or in one direction only by one or other of several parts which reciprocate at different speeds, substantially as described.

4. The apparatus substantially as described and shown in figures 3 to 7.

#### Patents Granted in America.

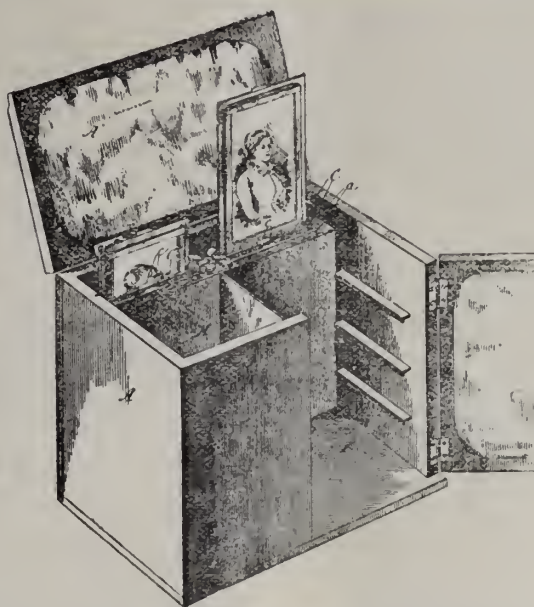
381,154. JULIA McAFFERTY, Chicago, Ill., for "Photograph-holder."—Filed June 27th, 1887. Serial No. 242,574. (No model.)

Claim.—1. A photograph-holder consisting of a box or case



containing vertical guide-grooves for the cards or frames, combined with springs or their equivalents for raising the frames or

cards, automatic locks for locking into the edges of the cards or frames near their upper and lower ends to hold them up or down

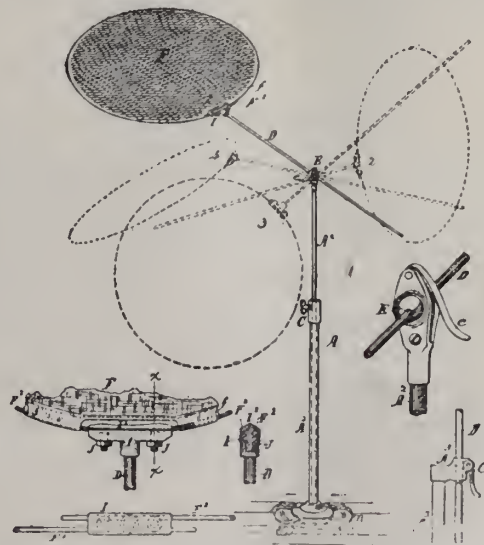


and push-buttons or their equivalents for disengaging the locks and allowing the cards or frames to be raised or lowered, substantially as set forth.

2. In a photograph-holder, the combination of the right-angled locking-levers D with the springs E, blocks B, notched sashes C, and vertically-arranged push-rods f, whereby a vertical push upon the rods releases the locks from the frames, and allows the corresponding slides to be thrown up or down, substantially as described.

382,125. OTIS C. WHITE, Worcester, Mass., for "Photographic head-screen."—Filed Dec. 29, 1887. Serial No. 259,278. (No model.)

Claim.—1. In a photographer's head-screen, the fabric screen-shade mounted at its border on a bow or hoop, and supported at



its edge, in combination with an adjusting-rod, to which the ends of said hoop are secured to maintain the fabric extended, substantially as set forth.

2. In a photographer's head-screen, a fabric shade or screen peripherally mounted upon a flexible hoop that is expansible for straining the fabric, and a binding-clamp that detachably hold



the ends of said hoop in position, and connects said shade to its supporting-rod.

3. In a photographer's head-screen, a fabric shade having its supporting-hoop connected with the rod or arm by a joint, and movable thereon, to give adjustment of the shade to different planes coincident or diagonal to the longitudinal axis of the rod, substantially as set forth.

4. In combination, the fabric screen having the hem *f*, the expansible wire hoop or bow *F'* rove through said hem, and the supporting-rod *D*, provided with a connecting-head, to which the respective ends of said wire are detachably fastened, for the purpose set forth.

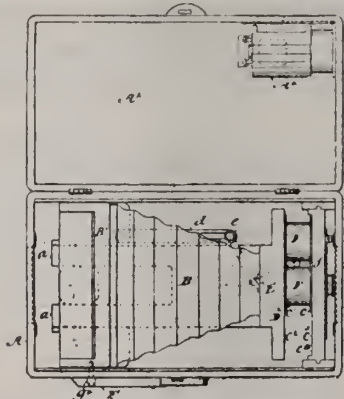
5. The longitudinally grooved clamping-head *I*, its cap *I'*, having screw-threaded shanks, and nuts *J*, in combination with the shade-supporting wire *F'* and rod *D*, substantially as and for the purpose set forth.

6. In a photographer's head-screen, the fabric shade *F*, circumferentially supported by an expansible border, in connection with its adjusting-rod *D*, and the universally adjustable clamping-joint *E*, having the binder *c* for releasing and tightening said joint, in combination with an extensible standard *A*, and the binder *C*, for retaining the movable part of said standard at raised or depressed position, substantially as shown and described.

382,735. THEODORE S. RUST, Meriden, Conn., assignor to The Scovill Manufacturing Company, New York, N.Y., "Photographic camera."—Filed March 16th, 1883. Serial No. 267,317. (No model.)

*Claim.*—1. In a photographic camera, the combination, with a box or case, of a movable back, two lens-tubes provided with lenses, and an adjusting device to adjust the lens-tubes during the movement of the movable back, substantially as specified.

2. In a photographic camera, the combination with a box or case, of a movable back, two lens-tubes provided with lenses, and an adjusting device to adjust the lens-tubes during the



movement of the movable back, said adjusting devices being capable of a limited range of movement without affecting the movement of the lens-tubes, substantially as specified.

3. In a photographic camera the combination, with a box or case, of a movable back, two lens-tubes provided with lenses, a rod connected to the movable back and provided with a slot, a bell-crank lever having a loose connection with said rod, and a rod or projection on said lever extending between said lens-tubes, and a lever for causing the adjustment of the movable back, and the lens-tube substantially as specified.

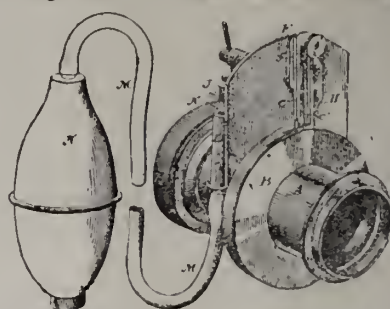
382,853. EDWARD BAUSCH, Rochester, N.Y., for "Diaphragm and shutter for photographic and other lenses."—Filed December 21th, 1887. Serial No. 258,886. (No model.)

*Claim.*—1. In combination with a suitable body or support, having an opening therethrough, the series of pivoted blades grouped around said opening, and each engaging directly with and actuating the next, substantially as described and shown.

2. In combination with a suitable body or support, the pivoted overlapping blades grouped around said opening, and each provided with a stud or projection to act directly on the next, in combination with springs tending to move said blades in one direction on their pivots.

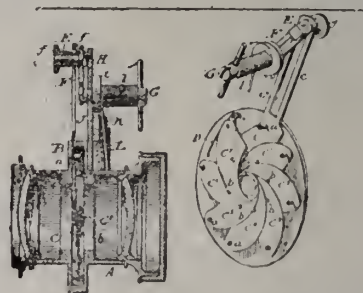
3. In combination with a suitable body or support, the series of pivoted overlapping blades directly connected by studs and slots, as shown, whereby they are caused to move inward and outward in unison.

4. In combination with a series of pivoted connected blades adapted to swing inward and outward across a central opening,



an arm extended from one of said plates, a crank acting on said arm, a spring to turn the crank, and a detent to hold the crank against the stress of the spring.

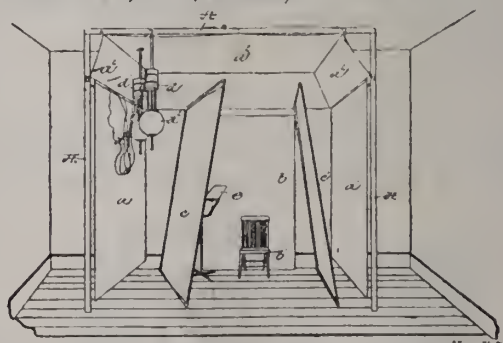
5. The series of pivoted blades grouped around a central opening and acting each to move the next, in combination with



the spring tending to close the blades, the slotted arm *c*, the slotted crank, the adjustable crank-pin, the crank-actuating spring, and the detent-lever.

6. In combination with a series of movable blades pivoted around the periphery of a central opening, and adapted to swing inward and outward across the same, an arm arranged to operate the said blades, a crank acting on said arm, a spring to turn the crank, and a detent to hold the crank against the stress of the spring, substantially as and for the purposes described.

384,151. FORREST B. GOULD, Milford, Mass., for "Apparatus for photographing by artificial light."—Filed May 9th, 1887. Serial No. 237,577. (No model.)



*Claim.*—1. A photographer's cabinet or apparatus having sides *a'* and top *a''* of translucent material rendered opaque on its outer side, and an artificial light located in said cabinet, combined with a translucent screen *c* between the said light and the subject to be photographed, and with a second screen located on the opposite side of the said subject, substantially as described.

2. A photographer's cabinet or apparatus having sides *a'* and top *a''* of translucent material rendered opaque on its outside, an artificial light located in said cabinet, a translucent screen between the said light and the subject to be photographed, and a second screen located on the opposite side of the said subject, combined with a screen, *e*, as and for the purpose specified.



## Proceedings of Societies.

### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

At the monthly technical meeting of this Society, held on Tuesday evening, the 26th inst., the chair was occupied by T. SEBASTIAN DAVIS, Vice-President.

The ASSISTANT SECRETARY read a letter from Dr. H. W. Vogel, of Berlin, in which he quoted and controverted a sentence in the May issue of the Society's journal which ran thus: "Others go to the opposite extreme and speak of colour sensitive gelatine dry plates that 'can be used without the colour screen,' which is of course true, because any plate can be so used, but is nevertheless a very misleading statement when made in this connection."

Dr. VOGEL maintained that the statement was not in any way misleading, and that in his paper, the *Photographische Mittheilungen*, Vol. XXIII, page 228, and Vol. XXIV, page 82, a method had been described by which plates were prepared with eosine of silver, that, used without any colour screen, showed a very marked difference when exposed upon an ordinary landscape from the ordinary unorthochromatic plates. In proof of this assertion he forwarded photographs of landscapes from negatives, one of which for each subject had been taken upon an ordinary gelatine plate, and the other upon one of the plates prepared by the method which had been referred to. The photographs were handed round for the inspection of the members, and the consensus of opinion was in favour of those photographs which proved to have been printed from the orthochromatic plates. It was added that the experiment could be verified by anyone, as the plates were now an article of commerce, being manufactured by Otto Perutz, of Munich, and on sale by his London agent. It was further stated that whereas plates of this make were at first only calculated to keep for two or three weeks, they had now stood the test of eight months' keeping, and remained in good condition.

FRIESE GREENE said that he had been experimenting in the direction of orthochromatic photography, and had obtained a decided result in photographing the spectrum by the following methods:—He steeped leaves of common ivy in liquid ammonia, 880°, for seven days, until a jelly resulted. He then prepared plates with this solution and albumen, obtained by soaking an egg in vinegar until the shell was dissolved, when yolk and white were beaten up together with 20 ounces of water. The plate was exposed to the image of the spectrum, and a coloured image was developed by treatment with nitrite of silver.

W. M. ASHMAN said that, with a thinly-coated albumen plate, it was quite possible to get an iridescent film, which might be supposed to represent a coloured image, and he thought that this was probably the case in the present instance, an opinion which was shared by other members.

F. GREENE continued that he had further to bring before the Society some experiments with regard to the formation of the latent image. He (F. Greene) had always been under the impression that Capt. Abney was wrong in the theory, and this impression was confirmed by reading a recent paper by T. W. Drinkwater, in which the author stated that the action was electrical. That theory he considered to be undoubtedly the true one, and he had experiments to prove that the action was electrical and magnetic. He then showed plates which had been coated with collodio-chloride of silver, and exposed to the light except where a horse-shoe magnet had been laid upon them. The form of the magnet had traced itself as a white image upon a deeply-printed ground, except that for a space of about an inch under the ends of the magnet there was a slight reducing action, which he attributed to the magnetic action at the poles.

A member remarked that the action appeared to exist only where the ends of the magnet had not been covered with the red wax, and that this action might be due to a little light reflected from the bright steel. He suggested that the experiment should be repeated with the magnet either brightened all over the lower surface, or else blackened all over, and then observing whether there was any more action under the poles than elsewhere.

Another member suggested that there might be a little reducing action due to the contact of the metal (steel) with the silver salt, which was probably not absolutely dry. If the magnet were varnished all over there would probably be no action.

F. GREENE would try the experiment under the conditions suggested, and report again.

The meeting was then adjourned to Tuesday, July 24th.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The ordinary weekly meeting was held on the 21st inst., A. PRINGLE in the chair.

A frame of collodio-bromide transparencies from negatives taken at Epsom during the recent race meeting was exhibited by J. B. B. WELLINGTON.

P. EVERITT handed round several samples of different kinds of paper that he believed would be found suitable for the Platinotype process. They were obtained from an English mill.

S. G. B. WOLLASTON said Messrs. Joynson and Son were engaged in a series of experiments with a view of producing paper for photographic purposes—the characteristics aimed at were that it should be pure, tough, and absorbent, at the same time must be hard superficially.

W. E. DEBENHAM believed the samples of paper passed round had been sized with gelatine, which would render the paper unsuitable for Platinotype work.

The CHAIRMAN enquired if any of the members had tried the system recommended by Captain Abney of coating plates with stained collodion or varnish to render them orthochromatic.

J. B. B. WELLINGTON had done so, and referred to some negatives he had shown at a previous meeting; he had used erythrosin to produce from a weak up to a dense stain without effect.

The CHAIRMAN remarked that his experience had been precisely similar; he had made five batches of collodion, stained with erythrosine, ranging from 1 in 1,000 to 1 in 10,000; he was unable to get any orthochromatic effect.

In reply to a question, whether a patented article could be used individually,

A. VARLEY replied that the subject of a patent might be made for experiment, but it must not be used for purposes of profit, or in a general way.

J. B. B. WELLINGTON instanced the case of a schoolmaster who used a telephone for the purpose of explaining the construction of the same to his classes; this was considered an infringement of the company's right, who withheld their permission to allow the instrument to be further used.

F. W. HART remarked that Prof. Clark had used in his lecture a telephone given to him by the inventor, Prof. Bell. The company claimed the apparatus, and requested that it should be given up to them.

J. TRAILL TAYLOR queried whether an invention shown at a private meeting would invalidate its claim to protection.

A. VARLEY said it would, if shown to more than seven persons. The communication might be privileged, but would not be considered so if either of the persons by accident or design spoke of it outside.

J. J. BRIGNSHAW drew attention to an article recently published, referring to a rainbow streak produced on a gelatine plate by chromatic aberration, which had stood the test of fixation.

J. TRAILL TAYLOR believed the phenomenon was due to iridescence.

The CHAIRMAN, referring to the speed of shutters, remarked how widely authorities differed on this point. In one case the speed of a shutter, which had previously been estimated at the  $\frac{1}{100}$  part of a second, was given as the  $\frac{1}{15}$  part of a second.

T. W. HART said the speed of a shutter could be accurately determined with a Moorse instrument up to the  $\frac{1}{8000}$  part of a second.

A. VARLEY confirmed this. Exceedingly minute determinations could be made by this means.

J. TRAILL TAYLOR suggested, as a rough-and-ready way, the swinging of a pendulum, having a black ball traversing in front of a white background, or *vice versa*.

W. E. DEBENHAM said the speed of the pendulum not being equal throughout, the swing would render calculations inaccurate. He suggested a tuning fork with a bristle attached. The number of curves registered would give far more exact calculation. It was not everyone who could apply the Moorse instrument.

### NORTH LONDON PHOTOGRAPHIC SOCIETY.

An ordinary meeting was held on June 19th, at Myddleton Hall. J. TRAILL TAYLOR, President, in the Chair.

The PRESIDENT opened the discussion on "Rapid Shutters" by exhibiting a large number of examples, including nearly all the types now in the market. Among them was a very simple form introduced in America some years ago by Mr. Prosh. This was composed of a figure 8-shaped piece of metal, each half the size of the lens, rotating on an axis and impelled by a



spring; on the detent being raised the lens was rapidly uncovered and covered again by the second circle. The President's exhibits also comprised, amongst many others, a Kershaw shutter, adapted for a pair of stereoscopic lenses, Richmond's automatic flap shutter, a rebounding shutter by Lancaster, an up-and-down landscape shutter by Cadett, Rayment's "Plunge" shutter, Watson's original snap shutter, the Phoenix shutter, and Goltz's Volute shutter, the last possessing the novel quality of giving several exposures with one winding of the spring; all the working parts being balanced, the whole arrangement was remarkably free from vibration.

E. CLIFTON exhibited Martin's "Autocrat" shutter; it was of the rebounding type, and would give rapid exposures, the speed being regulated by the use of rubber bands of various strengths. There was also a simple arrangement by which exposures from half a second to several seconds could be given; the moving part being made of ebonite and very light lessened any chance of vibration during exposure. Mr. Clifton also showed Durnford's right-about-turn shutter, Place's double-sliding shutter, a French go-and-return and flap shutter combined, and the Leicester exposing flap and shade.

W. T. COVENTON exhibited a stereoscopic shutter on the revolving blind principle, made by Dallmeyer; also a double flap shutter, geared so that the lens could be rapidly opened and closed, and the aperture regulated to suit the subject.

A. E. SMITH exhibited Funnell's double flap shutter and a simple drop shutter to pass through the lens mount, the drop being made of vulcanised fibre propelled by a rubber band.

The Rev. E. HEALY showed Cadett's lightning shutter and a simple drop shutter, in which the sliding portion was caused to ascend instead of descending.

F. G. READER showed a very light and efficient rebounding shutter in metal, showing no perceptible vibration or shock.

A. S. NEWMAN showed his improved rapid shutter, giving an exposure of the one-one-hundredth of a second without vibration. He explained that this was effected by balancing the crank motion by a heavier piece of metal travelling at a slower rate. He also exhibited his new studio shutter, which has recently been described in these columns.

W. FEW exhibited Sargent's shutter, which he said he had not found quick enough for detective work, although it was very useful for time exposures, and a simple shutter of the original Sands pattern. He wished to know which was the best motion for a shutter, a continuous one or a go and-return?

The PRESIDENT said that a continuous movement was preferable.

L. MEDLAND asked what shutter was used for photographing projectiles in their flight.

The PRESIDENT said that in 1866 some successful pictures of cannon balls emerging from the mouth of the gun were taken at Woolwich; a portrait lens fitted with a revolving shutter was used, wires were stretched just outside the muzzle, and on these being cut by the shot, electric contact was made, and the shutter thus automatically released.

F. W. HART said the timing of shutters was an important and delicate operation, and was usually very imperfectly performed. He had been informed that a very accurate method of testing the rapidity of shutters is by the Moore telegraph instrument. The experiment is conducted by first winding up the instrument and timing the paying out lineal yards of tape, then the shutter under trial has an electric contact fitted and connected with the instrument and battery; the instrument being wound up as at first and set going, the shutter is put in action, and as it makes the contacts it is recorded on the tape; the measurement between these points gives the data to calculate the duration of exposure. By this method we are assured by a high authority, who has had lengthy experience of this system of measurement, that it is quite possible to estimate the one-eight-thousandth of a second. This method is quite independent of light or plates. Most of the methods with exposed plates give blurred edges very difficult to decide which is the actual beginning or end.

The next meeting, on July 3rd, will be a technical one.

#### ROYAL METEOROLOGICAL SOCIETY.

THE concluding meeting of this Society for the present session was held on Wednesday evening, June 20th, at the Institution of Civil Engineers, 25, Great George Street, Westminster, Dr. W. Marcet, F.R.S., President, in the Chair.

Mr F. B. De Collenette, L.R.C.P., M.R.C.S., Mr J. Ewart, M.R.C.S., Mr F. A. Velschow, and Mr J. T. Wills, F.R.G.S., were elected Fellows of the Society.

The following papers were read:—"First Report of the Thunderstorm Committee." This report deals with the photographs of lightning flashes, some sixty in number, which have been received by the Society. From the evidence now obtained it appears that lightning assumes various typical forms under conditions which are at present unknown. The committee consider that the lightning flashes may be arranged under the following types:—1, Stream; 2, Sinuous; 3, Ramified; 4, Meandering; 5, Beaded or Chapletted; and 6, Ribbon Lightning. In one of the photographs is a dark flash of the same character as the bright flashes, but the Committee defer offering any explanation of the same until they get further examples of dark flashes. As the thunderstorm season is now coming on, the Committee propose to publish their report at once, along with some reproductions of the photographs by the Autotype process, in order that observers may be prepared to notice the various forms of lightning.

### Talk in the Studio.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.—At a meeting on June 6th, George B. Wood showed some silver prints on ordinary postal cards. The cards were floated on the bath in the usual manner with albumen paper, without preparation of any kind, and produced very fair results. He also spoke of a means of focussing in case of breaking the ground glass of the camera. If a focussing glass was placed upon one of the broken pieces of ground glass left in the frame, an accurate focus for the plate could readily be obtained. He had obtained a perfect print from a cracked negative by suspending the negative from a sky-light, face of printing-frame down, within six inches of the floor. The process is slow but sure, requiring about an entire day to make the print.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, July 4th, will be on "Prints and Print Washing." Saturday outing at Wimbledon Park.

### To Correspondents.

JAMES KING.—Nothing of any real importance in connection with detective cameras has been really patented, although there have been numerous claims for old arrangements. Make your camera, and use it in peace.

A. L. B.—If you go to any high-class opticians for your lenses, you will have no occasion to return them for any such reasons. You are quite right in your assumptions as to the correct ratio.

G. B. CROSSLEY.—All have been republished in the PHOTOGRAPHIC NEWS. Perhaps, however, you can obtain copies of the originals by applying to the City and Guilds Institute, Gresham College, London, E.C.

FRED. J. BOYES.—If your account of the matter is a correct one the advertiser has obtained your money under false pretences; and if you write to the Chief Constable of the town, the matter should be dealt with in the ordinary course.

A. C. M.—1. As far as we know there is no live patent which covers the method, although some details of working may be subject of claims still valid. 2. Either the toning action has not gone far enough to convert the whole of the silver into chloride, or the treatment with ammonia has been insufficient to remove all the chloride. The yellow stain is due to silver. 3. Avoid allowing the products of combustion to enter the muffle.

Dr. MORTON.—Thanks for the typographical correction. As regards reproduction in block form much depends on the character of the originals, and this quite apart from the general excellence. You can have casts of any blocks that are made.

C. K. P.—1. The YEAR-BOOK in question is not in print, but you can see it at the Patent Office Library, 25, Southampton Buildings, Chancery Lane. 2. Ordinary tetra-chloride of platinum: but judging from what you say, the solution must have been too strong.

PURCHASER.—We quite understood the facts as you explained them last week, and as you re-explain them this week. Our opinion is that you have acted quite unreasonably in the matter. As regards your question whether 2s. 6d. would have been an excessive charge for the correspondence in question, we must say that we think it would have been a moderate one, and far less than a professional scribe would have charged for doing the work. You do not seem to understand the difference between charge for material used, and charge for work done. As regards the other matter, we can only congratulate you having treated the person you name in so liberal a spirit.



# THE PHOTOGRAPHIC NEWS.

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### ORTHOCHROMATISED PLATES FOR GENERAL WORK.

A CONSIDERABLE time has now elapsed since the promulgation of the discovery that by the addition of certain dye stuff to the sensitized silver compound, a different range of sensitiveness is obtained to the various colours of the spectrum, whether in their native purity, or as they are represented in the colours of natural objects which it may be desired to represent by photography; and that this range may be made to correspond far more closely with the effect of luminosity which such colours produce, through the eye, upon the mind of the spectator, than that given by the silver salts themselves without such addition.

It may, at first sight, appear surprising to many, considering how many years this idea has been before the public, and how much attention has been bestowed upon its development by leading scientific men among the photographic experimentalists in various parts of the world, that the advantage which such an approximation to a more truthful representation—enabling us to meet, so far as it goes, the greatest reproach which has been brought against photography—should not have been by this time so fully appreciated as to ensure its almost universal adoption. As very commonly happens, several causes were at work tending to delay the general use of an improvement which may now be considered to be established as such. One of these causes was doubtless the fact that photographers had been led to expect results of a somewhat similar character from the substitution of bromide for bromo-iodide of silver, when the gelatine process came to take the place that had been previously occupied by collodion, and had found that practically, there was no difference in the power of rendering coloured subjects when used in the camera in the ordinary way for the reproduction of natural colours.

This disappointment naturally engendered amongst those who make photography their business, a certain amount of disbelief, and unreadiness to venture upon further trials in the same direction.

Another serious drawback was found in the fact that the earlier prepared orthochromatised plates commonly gave a somewhat veiled image, deficient in the brightness and pluck so necessary for successful commercial work. Yet a third drawback—and perhaps the most important one—was, that with orthochromatised gelatine plates as at first prepared, it was necessary, in order to obtain any very decided effect when photographing natural objects of the ordinary kind, to employ a coloured screen, which at the same time introduced certain optical difficulties, and necessitated a considerably prolonged exposure. All these considerations militated seriously against the general adoption of orthochromatised plates for the ordinary work of the studio and the field, although the undoubted advantage of the principle of colour sensitising caused it to be more and more taken up, when a truer representation

of the effect of various colours was most required, and when, as in the case particularly of copying paintings and other works of art, the disadvantage of prolonged exposure due to the use of the colour screen was not serious.

The undue prominence of action by objects of certain colours, violet and blue, and the corresponding insufficiency of photographic energy displayed by others, green and yellow particularly, as evidenced by the want of lightness and life in the foliage of landscape photographing, and the excessive prominence given to freckles and to yellowish discolourations of the skin in portraiture, have steadily been kept in mind by scientific photographers, who have strenuously endeavoured by research and experiment to remove this stigma upon photography, as well as by those whose bent is more in the artistic direction, and who recognise only too strongly the evils referred to, and are ready to hail with delight a remedy for or palliation of it, if only it can be shown that the remedy is a real one, and within the range of practical application.

Some landscape photographs which we have seen recently, and which we were given to understand had been produced without the interposition of a coloured screen, upon plates prepared after a formula by Dr. H. Vogel, lead us to believe that the time is not far distant when a much more extended use of orthochromatised plates will be made than has been the case up to the present time. In landscape work generally the tendency is for trees and bushes to come too dark and heavy, relieved principally by the light reflected in a glistening manner by some of the leaves which happen to be at such an angle as to reflect the light from their surfaces. In the examples we have referred to, clumps of bushes and other foliage came out without excessive glitter, and with a beautiful light extending over the greater part of the objects, contrasting, as we see it in nature and in good paintings, with the bold decided shadows of the stems and base; altogether giving that roundness to the object, as a whole, which is a beauty so much to be desired in the foliage of landscapes in a general way, and indeed which was in marked contrast with some other photographs of the same scenes, taken, as we understand, under similar conditions, with the exception that in the latter case ordinary unorthochromatised gelatine plates were employed. We hope that good use will be made during the present summer of plates giving such superior effects. The exhibition of the results of such work at Pall Mall in the autumn will, we fancy, do more towards the general adoption of a more truthful delineation by photography, than any words can achieve.

In the studio, too, the employment of orthochromatised plates should, besides the better rendering of draperies, tend to reduce the necessity for retouching. There is no doubt that retouching, whilst an admitted necessity for those who have to make a business out of photographic



portraiture, has, in many cases, been made to act as a substitute for good, sound photography, and so has been the cause of stagnation, or even deterioration, in the quality of the work produced. Retouching has been made a necessity, partly from the love of the sitter to be flattered, but partly also from the need for correcting the faults of photography itself. One of the faults, excessive blackness of the shadows, may be very much remedied by careful lighting and exposure. Another fault, that which has been referred to as the too powerful rendering of freckles and other yellowish discolourations of the skin, to which might be added the insufficient lightness given to fair hair, may now be greatly alleviated, if not entirely removed, by the use of plates having a different range of sensitiveness and colour from that possessed by the haloid salts of silver alone. There is then a prospect of real improvement in photography, which we trust will stimulate our readers to do their utmost to help on the accomplishment of this long-felt desideratum.

One thing more. The sensitising of the silver compound for those rays which produce too little effect on the plate in proportion to their luminous power to the eye, should—and we understand, does—exalt the sensitiveness of the plate as a whole. So then, instead of having to do with an exposure of increased length, we may, when using orthochromatic plates that are really effective when employed without a coloured screen, expect to find that we are enabled to still further shorten the exposure, and so a gain all round should result.

#### PHOTOGRAPHY AT SOUTH KENSINGTON.

In the Prospectus of the Normal School of Science and Royal School of Mines, we find that Captain W. de W. Abney, C.B., R.E., F.R.S., is entered as Occasional Lecturer on Photography, and the following particulars are given on page 47 of the prospectus:—

There will also be given a course of about twelve lessons in practical photography as adapted to industrial and scientific purposes, on Fridays from 2 to 5 p.m., beginning 1st March, 1889, including the photography of architectural subjects (interiors and exteriors), machinery, apparatus, &c.; printing in silver, platinum, and carbon; the preparation of lantern slides for educational purposes; copying tracings, &c.

Each student joining this class will require a set of apparatus, of which the following may be taken as an example:—

A half-plate bellows camera with swing back and rising front, and one or more double backs.

A suitable lens.

A focussing cloth.

A tripod stand.

A dark-room lantern.

Students about to purchase are advised to apply for further details of this apparatus. A small supply of sensitive materials will also be required from time to time. This class is primarily intended for third years' students. As the accommodation is limited, application for admission must be made to the Professor.

#### NOTES FROM NEW YORK.

BOSTON EXHIBITION—NEW YORK AND PHILADELPHIA SOCIETIES' EXHIBITS—MISCELLANEOUS EXHIBITS.

FIRST among the New York Society exhibits mentioned in the catalogue is one frame No. 3, "Portrait of the Exhibitor," made by the magnesium flash light, by Edward R. Shedler. It was by all odds the best magnesium flash picture in the exhibition, being soft, clear, and equally lighted, and also devoid of lanky heavy shadows.

In frame 67, Franklin Harper had a cunning picture called "Good Morning," representing two little girls kissing each other. His frame of transferotypes on opal

was quite interesting, the best picture being "Grand Parade of Prize Winners," showing four little girls dressed in "Dolly Varden" gowns, standing in a row, each holding a puppy.

Hon. John Boyd Thatcher, of Albany, N. Y., a corresponding member, had three frames of good work. In 87 were several trotting pictures; that called "Forest Prince," trotting at the rate of 2.20, was noticeable for the fine action displayed, and care that must have been required in development.

A picture in frame 88, called "The Turks" (5 by 8 in size), was particularly soft and good. His view in 89, entitled "Bobbing, an Albany Winter Sport," was very cleverly done, having the merit of being full of detail, and well illustrating the style of the sport. His portrait called "Tragedy" was quite effective, and was well lighted.

In frames 107 and 108 were six pretty photographs by Zachary T. Benson. Those which were of special merit, so far as clearness and artistic qualities are concerned, were called "Winter Scene," West Farms, N. Y., a winding road under trees, covered with freshly-fallen snow; and "On the Pocantic," Tarrytown, N. Y., a very attractive brook scene. Nine 3½ by 4½ views on bromide paper at Nassau, N. P. Bahamas, by Richard Hoe Lawrence, were excellent specimens of detective camera work, being beautifully clear, crisp, and sharp. One, a group of native people under a peculiar large-branched tree, was especially good. He also had a platinotype enlargement, which was very well done.

Coming to the most extensive "Ladies' Exhibit" in the exhibition, in that of Miss Catherine Barnes, a corresponding member, who was also awarded a diploma, is found much to admire and enjoy. Her exhibit comprised twenty-seven 8 by 10 pictures, in as many frames. Some of the best were 133, an excellent interior of a parlour (beautifully lighted, soft, and well developed); 134, "House Exterior;" 136, a landscape, showing exquisite detail and fine technical excellence; 144, portrait of a lady sitting at a small table at tea, surrounded with fine drapery, such as screens, &c. The posing was very graceful, the lighting beautifully even and soft, and the detail sharp and clear. 148, another very pretty portrait of a young lady standing near a chair reading the story of her hand. It was chiefly meritorious for its softness, easy posing, and general effect. 151 was a view looking out among the leaves of a veranda; it was very pretty, the detail being beautifully rendered. In the brightest parts of the sky there was a slight halation. The excellent work of Miss Barnes will always be remembered, as setting a worthy example for others to follow, and it is to be hoped that her work will also appear in the next exhibition at Philadelphia. Mrs. Robert W. De Forest had one frame of six 6½ by 8½ views called "Cloud and Sunlight on the Adirondack Lakes." Some of them represented some novel and good cloud effects, but a few were undertimed.

In Prof Henry A. Rowland's exhibit, also a corresponding member, was to be seen one of the gems of the exhibition. His four 8 by 10 Norwegian views, taken mostly instantaneously, were magnificent specimens of artistic landscape composition, and included beautiful cloud effects. He also had some splendid 14 by 17 transparencies representing similar subjects. His 18 by 22 enlargement of the yacht "Yolande" was beautifully done, and if any award had been given for enlargements he was certainly entitled to it. The fine technical quality of his work should be mentioned; it would be hard for the best professional photographer to excel it. He took two diplomas, one for the best "landscape" 8 by 10 in size, and one for the best transparency.

Probably the best prints on plain salted silver paper in the exhibition were shown in the sixteen frames sent by Edward Leaming. Many were printed on Japanese tissue and parchment paper, presenting a novel, peculiar, and artistic effect. Some of the best were 251, "The



Whispering Pines"; 253, showing fine cloud effects; 257, "A Country Road;" and 258. He had also some fair specimens of magnesium flash light group pictures. He has the distinction of being the most poetical exhibitor in the exhibition, accompanying the views by no less than four quotations from Longfellow's poems, and three others of a miscellaneous character.

F. C. Beach had two exhibits; in frame 295 were three 8 by 10 pictures, one a portrait of a baby in a carriage, which was quite soft and well rendered. Another, called "Old Stratford Elms," was a particularly pleasing and artistic street view, showing fine detail in the branches of the old trees, and beautiful light and shade effect on the ground. There was also a silver print from a Vergara film negative, samples of which were in frame 296. Here there were negatives and positives developed by ferrous oxalate, pyro and potash, hydrochinone and potash, and pyro and ammonia. The transparency developed by hydrochinone seemed to be the clearest. A small strip of the natural film was secured to one side of the frame. The latter was hung with the other exhibits of transparencies. Though not technically perfect, in several respects the exhibit was quite interesting in showing the action of different developers on the film, and its nature.

A number of artistic and interesting pictures representing Southern California and the Yosemite Valley scenery were sent by Geo. Marshall Allen. His work was technically good, clean, and attractive. In frame 297 were two fine pictures, one entitled "The Castle Geyser," Yellowstone National Park, and the other "Twin Palms"; the rendering of the detail in the latter was excellent. In 299 were "Chinese Quarters on the Ranch, Southern California," and "Washing Day," two generations—ancient and modern—the latter showing the different ways of washing very nicely; it was a typical picture of its kind. The former represented an old hut completely covered over by a beautiful California tree of rich foliage. His best pictures were "Yosemite Valley, from Inspiration Point," and "Pikes Peak and Gateway to the Garden of the Gods." Both were taken from excellent points of view, and displayed unusual merit and care. It should be mentioned that the printing of the pictures was done by the exhibitor. They were 6½ by 8½ in size, and very neatly and tastefully framed. Mr. Allen also sent a set of six lantern slides; those entitled "The Midnight Sun," Alaska, and "On Cooper's Ranch," Santa Barbara, Cal., being the best. He also exhibited two 6½ by 8½ transparencies of considerable merit.

A single picture entitled "White Lilies," by C. W. Canfield, president of the New York Society, was very neatly done, and showed careful manipulation.

David Williams had four fairly good 6½ by 8½ opal pictures, three of which were cloud studies at Lake George; "The Passing Cloud, 4 p.m.," in frame 307, was the best.

Of the five bromide enlargements by L. P. Atkinson, that in 310, called "Delaware Water Gap," was perhaps the best, though it looked somewhat smoky, as if the development was not carried far enough. The blacks were too grayish to look well. In one, entitled "Oxen and Cart," was an example of printing in a sky, which required considerable care and skill. The character of the frames rather destroyed the good qualities in the picture, and the latter were hung too high to see them to good advantage.

Chas. Simpson sent a set of six slides representing scenes in New York during the great March blizzard. His view of the melting of the snow in Howard Street was very much liked.

James H. Stebbins had one frame of three pictures, two of which are of historical value in showing how the Elevated Railroad looked just after the March snow blizzard. He showed good work and careful manipulation. Altogether, there were sixteen exhibitors from the New York Society.

Passing next to the exhibits of the Photographic Society of Philadelphia, there are fourteen frames of excellent work by Charles L. Mitchell, M.D. Some of the best

were—11, "Indian Summer;" 12, "Autumn" (very pretty tree studies); 20, "Fallen Monarch" (a large tree); the detail was beautiful, and the picture as a whole particularly good. There were two 11 by 14 pictures of snow, which were fair; but his reproduction of an "Old Engraving" showed remarkable skill and superior technical excellence. The copy was apparently as perfectly rendered in every minute detail as the original.

As usual, George B. Wood displayed a large variety and number of 6½ by 8½ photographs, and carried off two diplomas. Five of his frames were on the floor. 39, entitled "The Dog Show," showing four pretty little girls queerly dressed, standing in a row, each holding a puppy, was capitally done and very clear. 41, called "Driving Sheep," was a very pretty study of animals.

Another interesting study, entitled "Day before Christmas," in 49, showing a boy walking off with a turkey and a girl looking on with her pet dog near by, was particularly good. A very natural picture in 53 was called "Leetle hard of hearing," illustrating a boy trying to talk to a dear old man. Most of Mr. Wood's pictures were made instantaneously, and were good, technically speaking.

In Henry G. Keasby's exhibit of five frames, 63, called "Through Winding Ways" (showing a brook winding through rocks), is the prettiest. A few of his pictures looked too black in the shadows, as if he had either under-timed or under-developed. One was hung too low down.

The fine quality of work exhibited by Robert S. Redfield in his six frames will ever be remembered. His "Victual and Drink" study, showing two pictures, side by side, of a little girl in the act of eating and drinking, was capitally done. In his view of "Western Connecticut" were some beautiful cloud effects, while his "Loitering" was noteworthy for the beautiful detail under the trees, and its general artistic effect. His "New England Watering Place," in 71, representing a boy carelessly seated on a white horse, while the latter was drinking out of a large round iron watering trough, was a delightful piece of composition, and displayed superior technical excellence. His other views were in keeping with his usual careful work. He sent also three sets of lantern slides, eighteen in all; many were illustrative of the Centennial Anniversary held in Philadelphia last fall. His views of the U.S. naval ships, and picture called "A Visit to Bunny," were particularly good and interesting.

Henry H. Suplee had six frames of magnesium flash-light pictures, that were called "Ready for the Dance," taking the diploma for a new process. It was not equal in quality, in the opinion of several, to other pictures in the exhibition made in the same manner, the shadows being rather heavy and inky.

A splendid photograph, clear, sharp, and well lighted, was that exhibited by C. R. Pancoast, of a "Three-Way Tapping Machine." He also had two other pretty landscape views.

In Edmund Stirling's six frames was a very interesting picture (163), called "South Down Sheep;" also his portrait by magnesium light, of a gentleman reading at his desk, was particularly good, having the merit of being evenly and softly lighted. 169, "A Shaded Path," Wis-sahickon, was a gem in its way—very artistic, sharp, and good.

John Carbutt had five frames, some of which were of interesting Victoria Regia Lily pictures. In 207 were several 4 by 5 instantaneous pictures of "Pole Vaulting," by Thos. Wray, showing good and careful work.

David Pepper was awarded a diploma for the best instantaneous work, and it certainly was of superior quality. He had one frame of nine pictures representing hurdle racing—W. B. Page making high jumps—and bicycle racing.

D. Pepper, junr., exhibited one frame of twelve 3¼ by 4¼ detective camera views, taken mostly in Norway, Sweden, and Holland. They were very well done.



Eight figure studies by John Bartlett, though hung too high to be seen to advantage, yet exhibited some beautiful work. His "Esmerelde" was a charming picture, very clear, soft, and crisp.

E. F. C. Davies sent a set of six interesting lantern slides, while S. Fisher Corlies had two very pretty transparencies, one called "Rope Ferry, on Shenandoah River, Va.," being especially good.

Thirteen exhibits is the sum total from the Philadelphia Society. Though not numerous, the general exhibit may be set down as highly artistic and meritorious. Probably, in 1889, Philadelphia will supply a feast of nice things for the photographer.

Taking up the foreign exhibits contributed by three exhibitors, Frank M. Sutcliffe, of Whitby, England, leads all, showing twenty-five  $6\frac{1}{2}$  by  $8\frac{1}{2}$  pictures. He took two diplomas. His work shows superior artistic knowledge, combined with technical excellence. Some of his best views were, "Waves at Whitby" (instantaneous); "Portrait of an Old Woman" (fine soft lighting); "Chaff" (excellent grouping of four rough-looking characters); "From Labour to Refreshment"; "Geese"; "Sheep"; a ploughing scene, called "When days are short"; and a beautiful snow landscape entitled "Softest coverlet of white naked earth enfolded." It was full of fine detail, clear and soft, and very artistic in its composition. His pictures were neatly mounted and framed by the committee, and were hung to the left of the main entrance. They attracted the admiration of all, and won many admirers from the thousands of visitors. John P. Gibson, of Hexham, England, also secured a diploma, and showed some exquisite landscapes; 289, called "A smile from the river that runs to the sea," combined beautiful effects of clouds, water, and foliage; 290, entitled "Out for a Holiday," showed a pretty winding road backed with fine clouds, and charming tree studies by the roadside.

A number of baby pictures and other portraits printed on Aristotype paper by Mrs. William Couper, Florence, Italy, were quite interesting.

Of miscellaneous exhibitors not previously mentioned, was found in the exhibit of John H. Matthews, Brooklyn, N.Y., an excellent 5 by 8 group of two girls in Tani O'Shanta hats.

John H. Tarbell, of New York, had four frames of portraits; that called "An Ambitious Amateur" painting on an easel was the best. There was also another of a young lady painting her portrait by reflection from a mirror, which showed good work.

George A. Nelson, Lowell, Mass., had two frames; one 195, a 5 by 8 entitled "Where the Cows Drink," comprising a fine study of trees and water, was especially commendable.

Miss Mary E. Butterick, Brooklyn, N.Y., displayed two very pretty photographs of trees and sunshine effect in frame 200.

Miss H. S. Woodruff, also of Brooklyn, N.Y., exhibited in two frames some good interiors of a church having the pulpit decorated with flowers. She also sent four transparencies, one of "Surf at Long Beach, N.Y.," being very good.

Miss Emma Farnsworth, of Albany, N.Y., had four frames of portraits and landscapes. One picture, called "An Autumn Scene," was the best, showing excellent choice of position, but generally the pictures were poor technically. When she becomes better educated, doubtless her work will display to better advantage, as what was shown indicates artistic tendencies.

The Harvard Photo-chloride paper exhibited a variety of prints, some of a greenish cast being very peculiar.

Robert L. Mason, of Providence, R.I., sent one frame, 230, embracing a variety of subjects, but his  $6\frac{1}{2}$  by  $8\frac{1}{2}$  view of a schooner and tug entitled "Drifting, Eastport, Maine," was the best, and quite artistic. He also contributed a set of six lantern slides.

Alfred Munro, of Concord, Mass., had one frame of a

dozen 5 by 8 cloud effect pictures. They were excellent and very diversified.

George J. Smith, Burlington Street, had one frame of ten views, which were of fair quality. They looked as if the negatives were too thin or were under-developed. The frame was not hung, but set on the floor.

V. E. Forbes, Rochester, N.Y., sent a set of six lantern slides, made by contact from large sized negatives. They were very clean and clear, but many of the subjects were out of proportion in size for the plate, and were accordingly enlarged too much when thrown on the screen.

Daniel Miller, Baltimore, Md., sent a set of six lantern slides, many of which were of superior quality.

From the catalogue the information is found that there were in all eighty-three exhibitors distributed as follows:—Boston Camera Club 32, New York Amateur Society 11, Photographic Society of Philadelphia 13, Miscellaneous 13, Foreign Exhibitors 3.

About forty-six of the eighty-three exhibitors did not do their own printing, a very large percentage, when it is generally understood that as much of the work as possible shall be done by the exhibitor.

In concluding this review, it may be noted that many new exhibitors appear, and it is hoped the effect of the exhibition will be to stimulate all to do better work next year.

SULPHITE.

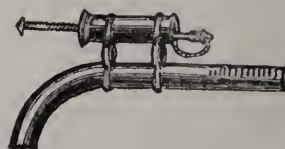
New York, June 23, 1888.

#### THE FLASH LIGHT IN HAND.\*

A NUMBER of contrivances have been suggested for the management of the flash light, and in working them resort has been had to every sort of ignition, from the common match to the electric spark. The drawback to much of the suggested apparatus has been that it is cumbersome and in the way, and prevents the disposition of the light being made just to suit the judgment and feeling of the operator, and the nature of the subject.

The best appliance we have seen comes to us from the Hawkrigge Manufacturing Company, and is the product of the fertile genius of Mr. S. Hawkrigge, whose fame as a magic lantern manufacturer and optician is well known to many of our readers.

We think the invention will be at once understood when we append an engraving of it with the instructions for using it



He calls it "The Non-explosive Pistol Lightning Flash." And here are instructions how to use the pistol lightning flash.

1st. Dip the perforated barrel of the pistol into a bottle of alcohol.

2nd. Light the same with a match, candle, or at the gas, allowing it sufficient time to burn into a good flame.

3rd. Take off the small tap with chain attached to it on the end of the tube on the piston barrel.

4th. Hold the pistol in your right hand in a perfectly horizontal position, with the curved part of the handle in the palm of your hand, place your forefinger on the first upright of the piston barrel, and your thumb on the knob at the end of the piston with the spiral spring on it, then push the piston with your thumb, regulating the size of the flash required according to the pressure of your thumb.

5th. To reload the pistol, unscrew the end of the pistol barrel with the tube, cap and chain attached to it, fill the piston barrel with the non-explosive powder to within one-quarter of an inch of being full, then screw on the end, and be sure that the tube, after it is screwed on, points directly over the centre of the perforated barrel.

6th. When not using the pistol for the flash, be particular to keep the small cap on the end of the tube, especially when dip-

\* Philadelphia Photographer.



ping the perforated barrel into the alcohol; by paying particular attention to this you will not lose nor waste any of the powder.

The length of the "pistol" is about a dozen inches, and the piston barrel, which is about three-quarters of an inch in diameter, contains sixty charges. Thus, it will be seen the flame and the non-explosive powder can be carried in the hand of the operator and "fired" upon his model at will—much on the light side—a little, to detail the shadow quarter, with as much ease and safety to the model, as Barnum's young lady surrounds her subject with broad-bladed butcher knives. It is entirely under control.

## CHAPTERS IN ELEMENTARY PHOTOGRAPHY— A GUIDE TO BEGINNERS.

BY W. M. ASHMAN.

### THIRD ARTICLE.

FROM what has been stated with regard to the camera and its functions in the production of photographs it should, in addition to being light-proof everywhere except through the aperture in the lens tube, possess the quality of rigidity in all its parts, whether lightness has to be sacrificed or not. It is also quite as important that the camera should be firmly supported during an exposure as it is that the instrument itself be safe in that respect. To gain our end in fulfilling the first-named condition, a series of clamping screws are provided, and to secure the last-named condition some kind of base, capable of conferring solidity, becomes essential.

Among the forms of support which have been contrived may be mentioned the table-top stand and the carriage, each designed to travel on castors, for use in an ordinary room or upon a studio floor. They are usually fitted with elevating racks, levers, archimedean screws, and such other adjusting appliances as prove useful for the purpose of raising, lowering, rotating, and otherwise altering the position of a camera in relation to that of the subject it is intended to photograph (fig. 7).

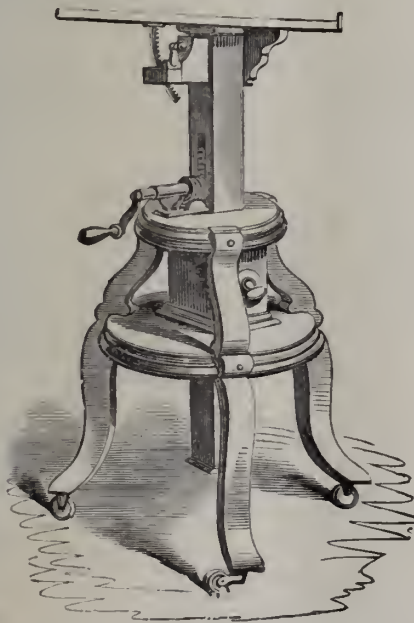


Fig. 7.

The Camera Clip, usually constructed of metal, is a handy contrivance for securing a camera to the rail of a ship, bicycle, or other base difficult to rest a camera upon in any other way. Several forms are in the market, and require no further description here beyond that conveyed in the illustrations (fig. 8). The kind of support used

chiefly in out-door photography is the tripod, which demands our more careful attention, for few tourists start



Fig. 8.

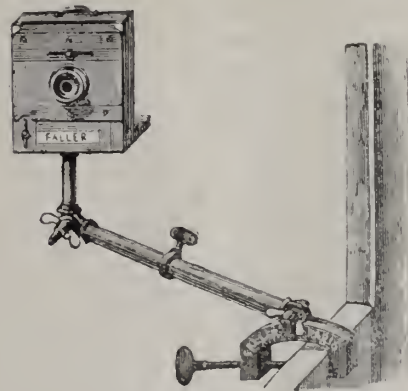


Fig. 8.

abroad on their travels without a good set of legs, as the tripod is familiarly termed.

The Tripod, as its name implies, is built of three supporting legs, which, when erected for use, are held firmly at an apex by means of a circular, triangular, or rectangular head. If one of the former shapes are employed, metal is generally used in construction; when the latter, wood is preferable. Whatever be the form, it becomes the base upon which the camera rests, and to which it has to be firmly secured. The other ends of the legs are provided with spikes, in order to gain a better grip on the ground if it be uneven or slippery. In some places an additional advantage can be derived by placing cork pads on the spikes to check slipping; but, as a rule, this precaution is unnecessary.

A useful tripod should, when rigged up, admit of a moderate degree of downward pressure being applied to the head, without producing visible effect upon the legs. The length ought not to be of less measurement than five feet, and if the legs are constructed to slide, which is sometimes an advantage, it is important that the clamping arrangement should secure equal firmness, when adjust-



ment of a shorter length is required. An ordinary tripod, opened and closed, is shown in fig. 9.



Fig. 9.

The form of solid leg tripod, known as the Alpenstock, is very light to carry, and steady when set up. It is often preferred by tourists when mountaineering with the camera, as it answers a twofold purpose—a reliable support for the camera when distended, and, closed with metal clasps, converts it into a stout pole some five or six feet long. As a rule, these tripods are not made to reduce in length for convenience of packing, but they are manufactured in bamboo with bayonet joint fittings, the claim being that rigidity is in no way sacrificed, whilst enhanced portability can be secured. For many years past W. England, journeying over the Alps and other mountainous districts of Europe, made use of a long bamboo stand, jointed fishing-rod fashion; each leg was divided in two at the centre, and when travelling Mr. England carried the six jointed portions strapped together like fishing tackle. The authority mentioned has also frequently pointed out the value of a tolerably broad base-board for the camera to rest upon, as the easiest means of conferring steadiness during exposures out of doors.

*The Dark Slide.*—Everyone purchasing an outfit is doubtless made familiar with the different kinds of dark slides, and the especial duty they are intended to perform, namely, that of protecting the sensitive surface from the influence of light other than that which is intended to reach the plate through the lens after the shutter has been withdrawn. Great care is required in the making of dark slides, in order to provide against the possibility of light entering by way of the joints. In first-class apparatus this feature is well attended to; but as the present demand for cheapness does not admit of the work being too nicely finished, it becomes obligatory here to impress upon buyers the desirability of testing every slide for leakage before putting a sensitive plate therein and starting out in quest of a picture. Some photographers recommend the plan of filling dark slides with sensitive plates, and exposing the slides to full sunlight for half an hour; if no fog appears upon development the slides may be considered quite safe. Another method, also efficacious, which does not involve the waste of plates and developer, is to scrutinise all working parts at night, or in the dark-room aided by the light of a candle, any part imperfectly light-trapped soon becoming evident. Folding double slides require greater attention in this respect than the solid form or single slide.

A double slide may permit daylight to enter at any point where the two halves join; but in the solid slide

light can only enter in the event of the sliding shutters fitting the grooves imperfectly.

Double dark slides are so named from the circumstance that two sensitive plates can be stored in each slide, and be exposed independently of one another. Single slides are constructed to receive one plate only. Sometimes a stock of plates are carried in a light-tight grooved changing box; then the single slide can, with advantage, be employed for any or all of the sensitive plates the box may contain. This is managed by causing a suitably fitted dark slide to travel in runners along the top of a changing box; in doing so, a slot becomes uncovered sufficiently to admit of the entry or exit of a plate to or from the groove situated immediately beneath. The dark changing box is very portable, but the chief objection to its general adoption lies in variability in thickness of the glass plates, many of which do not travel freely. They are less used now than formerly, as half a dozen double dark slides, holding one dozen sensitive plates, are as portable as and no more weight than a changing box with twelve plates and a single slide would be.

### LARGE BLUE PRINTS.

BY R. H. THURSTON.\*

THE writer has, on earlier occasions, presented to the Society with the kind permission of Professor E. C. Cleaves, samples of blue prints of extraordinary size, as made by a method, and with apparatus, original, it is believed, with that gentleman. That exhibited at the Washington meeting of this Society, and a similar one exhibited at the Kaeterskill meeting of the Civil Engineers, were 8 feet long and  $3\frac{1}{2}$  feet in width. It will be remembered that they were made on a revolving cylinder, contact being secured simply by drawing the tracing tight over the sensitive paper, and the underlying felt by means of suitably arranged clamps and springs. No glass was needed, and the expense and risk, and something of the trouble, of the common method of operation were thus avoided.†

The writer has since had some still larger prints prepared by a still simpler apparatus and method, original with himself, and by which an almost unlimited area of surface may be printed. The blue print accompanying this paper is a sample of what may be done in any drawing room in which light can be obtained for such extent of print. It is a blue print from a tracing of one of Captain Zalinski's latest forms of pneumatic dynamite gun shells, as designed by him for the fifteen-inch gun now under construction. The print is 14 feet long and  $2\frac{1}{2}$  feet wide. It is a good sample of the fine work in printing and toning which is done by Professor Cleaves for the Sibley College of Cornell University. The formulas for the re-agents are derived by a systematic course of experimental investigation directed to that end some time since.

The printing apparatus used for this latter work consists of nothing but a single thin board, of the length and breadth of the proposed print, with some margin for the stretching clamps. This board is covered with good felt of carefully selected quality, securely and smoothly fastened to the board by any convenient means. A line of tacks does as well, perhaps, as anything. The sensitive paper is then stretched over the felt, and the tracing drawn over that, and both are smoothly stretched by clamps or other convenient device. It is of course evident that it would not be practicable by this operation simply to obtain that complete contact and pressure throughout the surface in contact that is required for good work; but this desideratum is easily secured by the simplest expedient imaginable: the board is merely sprung to a flat arc in the direction either of its length or its breadth, ordinarily in its longer line. This brings everything "taut," and the printing is done precisely as under glass, with the further decided advantage that no light is lost through the intervention of the glass; which, however excellent in quality, will inevitably absorb a very measurable amount.

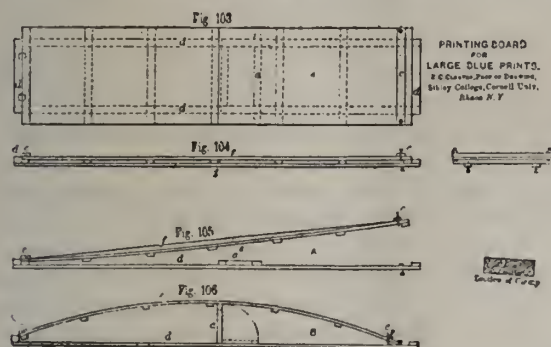
The accompanying sketch represents the apparatus designed by Professor Cleaves for the purpose of carrying into effect the suggestion of the writer in the making of the very large prints of which that presented herewith is a sample. Figures 103 and 104 are a plan and side elevation of the board and its mounting. It will be seen that the upper, or printing board, is supported

\* *American Journal of Photography.*

† *Trans. A. S. M. E., Vol. VIII., p. 722.*



upon a lower and somewhat narrower and longer one, which, in turn, should be carried on trestles or other convenient arrangement. The printing board is stiffened laterally by strips or battens, but is free to spring longitudinally to any desired extent. The supporting board is stiffened longitudinally. At



each end of the latter is a batten *dd*, set transversely, which answers as a chock, as seen later. Clamps *cc* are placed at either end of the printing board by means of which to secure the felt, paper, and tracing. One or both of these clamps may be made adjustable for varying lengths of print. Figures 105 and 106 show the method of operation. The board is first raised at one end, and thus slightly sprung. The felt and paper and the tracing which forms the negative, are stretched smoothly between the clamps and well secured. The board is next laid down on the supporting base, the two ends made fast, the one to the batten at the left, the other to another arranged at the proper distance from the right-hand extremity, the printing board springing into a curve of which the bridge *a*, hinged at the middle, as in *A*, and thrown up, as seen in the sketch *B*, gives the versed sine. By springing to any desirable extent, as in *A*, and then reversing the curve, as in *B*, any required degree of tension and stretch can be given the tracing, and thus any necessary amount of pressure and perfection of contact with the sensitive paper may be obtained. The two sections at the right exhibit the end view of the pair of boards and a section of the clamp used.

It is obvious that this scheme will suffice to print any area of blue-print that paper can be obtained to cover—a half-mile square if necessary. The amount of springing required is very small, and never enough to affect perceptibly the uniformity of the printing and tone of the print. If it should ever seem too great, it is easy to correct the defect by first springing the board in the reverse direction; then, after drawing the covering felt and papers tight, bending it in the first proposed direction, past the straight line, and as far as may be found desirable to secure good contact. We have found this method to work quite as well as the cylinder; which we still use, however, for what we now call small sizes. Perhaps this may be as well or better than the new method, up to eight or ten feet length, and for narrow prints; while the new arrangement may do best whenever extraordinary sizes—as gauged by our new standard—are called for.

## THE LITERATURE OF PHOTOGRAPHY.

BY W. JEROME HARRISON, F.C.S.\*

(71) QUARTERLY (THE) JOURNAL OF SCIENCE. Edited by James Samuelson and William Crookes. 7 vols., 8vo., 1864-70; J. Churchill and Sons, London.

Continued as:—

(71A) QUARTERLY (THE) JOURNAL OF SCIENCE, and Annals of Mining, Metallurgy, Engineering, Industrial Arts, Manufactures, and Technology. Edited by William Crookes. New series, 8 vols. (viii. to xv.), 8vo.; 1871-78. London, 3, Horseshoe Court, Ludgate Hill.

Continued as:—

(71B) QUARTERLY JOURNAL OF SCIENCE. One number, 8vo., 1879. London, 3, Horseshoe Court.

Continued as:—

(71C) MONTHLY JOURNAL OF SCIENCE. Nos. 2 to 12 (vol. xvi.), 8vo., 1879. Price 1s. 6d.

Continued as:—

(71D) JOURNAL (THE) OF SCIENCE, and Annals of Astronomy, Biology, Geology, Industrial Arts, Manufactures, and Technology: 1880-85||. Monthly, price 1s. 6d. Published at 3, Horseshoe Court, Ludgate Hill.

Several articles and many notes on photography appeared in the *Q. J. S.* This magazine ended with the number for December, 1885.

(72) QUEKETT MICROSCOPICAL CLUB, JOURNAL OF THE. Edited by Henry F. Hailes: 1868-88+; 8vo., price one shilling. Williams and Norgate, 14, Henrietta Street, Covent Garden.

The meetings of the Quekett Club are held at University College, Gower Street, on the second and fourth Fridays of each month. Annual subscription, 10s. Hon. Secretary, Mr. G. C. Karop, 198, Holland Road, Kensington, W. The club was established in 1865.

(73) RECREATIVE SCIENCE. A record and remembrancer of intellectual observation. 3 vols., 4to., 1859-61. London, Groombridge and Co.; 7s. 6d. per volume.

Continued as:—

(73A) INTELLECTUAL (THE) OBSERVER. Review of natural history, microscopical research, and recreative science. 12 vols., royal 8vo. 1862-68. London, Groombridge, 10s. 6d. per volume.

Continued as:—

(73B) STUDENT (THE) AND INTELLECTUAL OBSERVER OF SCIENCE, Literature, and Art. 5 vols., 8vo., 1868-71. London, Groombridge, 10s. 6d. per vol.

Several papers and many notes on photography are contained in the above volumes, written principally by J. W. M'Gauley, C. M. Archer, T. A. Malone, S. S. Baxter, and J. Sidebotham.

(74) STEREOSCOPIC MAGAZINE (THE): A gallery of landscape scenery, architecture, antiquities, and natural history, accompanied with descriptive articles by writers of eminence. (Edited by Lovell Reeve). 1859-65; five vols.; 8vo. Monthly; price 3s. 6d. Lovell Reeve, Henrietta Street, Covent Garden.

(75) SUNBEAM (THE): A Photographic Magazine. Edited by Philip H. Delamotte, Professor of Drawing in King's College London; Six parts, folio, price 12s. each (also published in one volume, price three guineas), 1857-61. Chapman and Hall, London.

The photographs are about whole-plate size, and appended to each is a description of the place or scene. There is no photographic information proper.

(76) YEAR-BOOK OF FACTS IN SCIENCE AND ART: Exhibiting the most important discoveries and improvements of the past year in mechanics and the useful arts, natural philosophy, electricity, chemistry, zoology, and botany, geology, &c. Edited by John Timbs (afterwards by C. W. Vincent and James Mason). 1839-85; 8vo., 180 to 200 pp. London, Ward, Lock and Co., Salisbury Square, E.C.

Brief Notes on Photography in each volume. There are extra vols. for the years of the great Exhibitions, 1851 and 1862.

(77) YEAR-BOOK OF THE SCIENTIFIC AND LEARNED SOCIETIES OF GREAT BRITAIN AND IRELAND, giving an account of their origin, constitution, and working. Compiled from official sources; with appendix comprising list of the leading Scientific Societies throughout the world. 8vo., 1884-88+; C. Griffin and Co., Exeter Street, Strand; price 7s. 6d.

The first vol. (for 1884) gives the History, Organization, and conditions of membership of each Society. The later volumes furnish a chronicle of the work done during the year by each Society; the titles of the papers read, &c., being given. The volume for 1887 contains 223 pp. The Societies are divided into fourteen sections, of which "Chemistry and Photography" constitutes section 3. Photography, however, only occupies a single page, the

\* Continued from p. 397.



names of thirty-three Societies, with their Presidents name and Secretaries' name and address being given.

(78) BOMBAY PHOTOGRAPHIC SOCIETY (JOURNAL OF THE). This was in existence in 1855; but I have no record of the date of its demise.

From the above list we see that a "complete" library of photographic works would include about eighty "English" periodicals. Forty-two of these include the word "photography"—or some equivalent of it—in their titles. Of these forty-two, the periodicals now in existence number eighteen; while twenty-four are extinct. No library in the world at present contains anything like a complete set of these eighty periodicals. We trust that the list here published may be of some service to those libraries, societies, and individuals who are endeavouring—ere it be too late—to gather together these invaluable records of what has been done in the past.

### Notes.

A Photographic Club has been formed in Paris, somewhat on the model of the London Camera Club, but the subscription is lower, and the Secretary is Gabriel Rougier, 8, Place de l'Odéon, Paris.

We have more than once mentioned the grotesque foregrounds which are made and sold by C. M. Coolidge, of New York, and the subjoined illustration of one of the



latest will afford a suggestion which many of our readers can work into actual deed.

"What an infliction is a stupid boy," exclaimed an irate photographer, the other day, when the lout of a lad let fall a packet of dry plates, and there was an ominous smash. "Yes, he's bad, but not so bad as your sharp youngster," said a friend, who was in the studio. "I had a boy once who was extremely clever. His only fault was that he thought he knew everything. When I was out one day—it was in the collodion times—a sitter called and the boy undertook to take him. Of course he had seen me photograph often enough, and it seemed very easy, he thought. The sum-total of his exertions which I discovered when I got home was very interesting. In two of the plates half the figure was focussed on the margin, and the rest was in space. In another he had the head-rest beautifully sharp and the head fuzzy. Two had got nothing at all upon them, because he had forgotten to pull up the shutter. These were stained through the developer going over half only of the picture. Two had slipped off the dipper into the bath, which was spoilt through his trying to fish them out with his fingers, and two had fallen from the

carrier into the sink. Nearly a pint of collodion had disappeared, and half the silver solution was on the floor. I had to tell him that as I didn't want an assistant he'd better find another situation."

A correspondent writes: "Seeing your interesting series of articles on 'Law for Photographers,' I should be glad to know if you can tell me what remedy (if any) I have against an intolerable nuisance which is only in operation when I am photographing in my garden. This nuisance comes from 'over the garden wall'—that is to say, from the boys next door. These two young gentlemen, apparently, see something funny in a photographic apparatus, and directly I have posed my sitter they start larking, but in such an insidious manner that I am afraid the law won't reach them. A favourite mode of torment is for them to pop their heads just above the wall the very instant they see the cap taken off the lens. This in itself is calculated to upset the nerves of the sitter, but when the faces of the boys generally have an inane grin, the consequences may be imagined.

"But there is a worse form of torture even than this. A few evenings ago I desired to photograph a young lady in whom I take an especial interest; and when I say that I also am young and a bachelor, you can easily understand what I mean. Well, sir, would you believe it, just as the exposure was made, one of these youthful fiends showed his diabolical visage and gave vent to an unearthly crow in imitation of the domestic fowl. Of course the photograph was spoiled, and, what was worse, the lady not only refused to sit again, but was annoyed, because she said I had exposed her to ridicule. If you or Mr. Debenham could help me I should be very grateful." We regret we can see no way out of the difficulty save building a higher wall. This would be effectual, but expensive.

Our spirited contemporary, the *Philadelphia Photographer*, satirises "Art Photography" according to rule and instruction, by the subjoined sketch, which represents



a photographer making the "third pose" of an example of "second childhood," according to directions given by Mr.



Rockwood for the production of a new and "fetching" picture.

*Anthony's Bulletin* says that a dry-plate factory has been started at Yokohama and that the Japan Dry Plate Company is now doing a good business, the demand being for slow plates at present.

Photographers have a great deal too much to do with the District Surveyor, and as a general thing they find that before getting plans passed for a studio they must bribe the surveyor, but the bribe is generally taken under the shallow pretence of acting as an architect or adviser. Sometimes, however, the corrupt surveyor attempts to screen himself by suggesting that an "assistant" or "friend" should be employed in this capacity. All interested should at once communicate with the Commission on the Board of Works, now sitting.

A justification for the proceedings recently taken by Messrs. Elliott and Fry in respect to the damage which was likely to be caused to their business by an adjoining hospital for the treatment of contagious diseases is borne out by an action which was heard last week in the Brighton County Court. A child of a photographer was seized with scarlet fever, necessitating its removal to the parochial hospital. It returned in a supposed state of convalescence, but though it had recovered personally, it had not passed the stage of safety in regard to others. Another child had the fever in consequence, and the fact becoming known, the photographer's business was ruined. Notwithstanding, the Town Council proceeded against the photographer for certain fees. The photographer resisted the demand, and preferred a counter claim for £25 for the loss of his business through the negligence of the medical officer who had allowed the first child to go out too soon. He proved his case up to the hilt, showing not only the cause of the illness of the second child, but also the loss of his business, besides having to sell his apparatus at a sacrifice. The Town Council consequently lost its case, and had to pay £25 for the counter claim. It is very certain that in the case of infectious or contagious diseases the photographer's studio must be—like Cæsar's wife—above suspicion.

Yet another name is to be added to the royal amateur photographers of Europe. That the Czar of Russia and the Sultan of Turkey had both gone in for photography with zest was stated in these columns long ago. Then came the news that the Crown Prince of Italy had developed a taste for cameras and dry plates; whilst later still the boulevard journals of Paris gave currency to the rumour that the ill-starred Queen Nathalie, of Servia, was finding solace in her virtual widowhood by plunging into photography with all the proverbial zeal of an amateur. It is on record, too, that the present Pope has written Latin verses of the most laudatory kind upon photography, though it has never been asserted that his Holiness had himself "developed" anything but a taste for this fashionable pursuit.

It is impossible not to think, however, of the splendid field a Pope would have for practice in the endless halls and corridors of the Vatican. Years would elapse, to say the least, before he could sit down and weep for more subjects to focus. But this is digression, and we have not yet revealed the name of the new amateur photographer of the blood royal. His name, then, is the Archduke Otto, and he is the first cousin of Prince Rudolph, and, as a consequence, nephew of the Emperor of Austro-Hungary. Prince Rudolph just now is "doing" Bosnia, and his archducal cousin, who won his photographic spurs at Prague in his student days, accompanies the heir to the dual throne as "Photographer in Ordinary" to the expedition. The fact is, the Austrian Crown Prince is making notes as he goes with a view to publication later on, and Archduke Otto's negatives—or those of them, at all events, which duly develop later on—are to form illustrations for the coming volumes of imperial travels.

Meanwhile, the archducal amateur is said to be having most interesting and amusing experiences with the Bosnians, who now that they have lost all fear that the camera mounted on its tripod was a new kind of machine for drawing them for the army, exhibit an embarrassing eagerness to be taken. Even the Begs, or great Mahometan landowners of the province, esteem it a compliment to be selected as subjects for the Archduke's negatives. And in order to please them all round, there has been already, it is said, a great deal of suppositious focussing, and make-believe taking of likenesses. Doubtless, there will be a corresponding amount of real disappointment when the book of Bosnian Travels comes out, but that the work will sell well may be considered certain.

## Reviews.

LETTERS ON LANDSCAPE PHOTOGRAPHY. By H. P. Robinson. 66 pages crown octavo. Price 1s. (*London, 1888: Piper and Carter, 5, Fumival Street, E.C.*)

THE little book before us, is in no sense a handbook of photography, but consists of a series of pleasantly written chatty essays on the esthetic side of the photographer's work. The author is a man who looks everywhere for the beautiful, and appreciates it wherever found, and a perusal of his work may assist others in finding it.

After all, much depends on the habit of mind of the searcher, and perhaps the deepest impressions of beauty result from a temporary ease of mind which enables us to see clearly that before us, while the drive of present time competition tends to chase all the perception of the beautiful out of mind.

Perhaps most in London have been deeply impressed with the striking beauties of our city, especially when morning or evening light is striving through the mist; and it is interesting to quote what Robinson says on this point:—

It was my unhappy fortune, in the early part of 1886, to have to lie on my back for some weeks, after a remarkable exploit in vivisection of which I was the victim, in an upper room at the back of a large house in one of the London squares. There was a large plate glass window overlooking a spacious court, in which were some low buildings with flat roofs of lead, the back of some old delapidated houses, and a splendid collec-



tion of chimney pots, amongst which the chirpy London sparrows held carnival. As many a London photographer will remember, there was scarcely a day in town during January and February of that year that was not foggy, the nature of the fog varying from a delicate silvery grey mist on some days, through drizzle, sleet, Scotch-mist, pea-soup, to "the blanket of the dark" of Macbeth, and the absolute darkness of "collected night" on other days. Thus thinly or thickly obscured, the view underwent every variety of picturesque change. The chimneys sometimes became towers and castles; the otherwise ugly and ignoble backs and roofs of houses, rocks, and mountains—the scenery of the Rhine without the river; and when the lead roofs beneath were wet with rain, it was not difficult to imagine the scene where—

"The castled crags of Drachenfels  
Frown o'er the wide and winding Rhine."

Sometimes the rare gleams of the low sun struggled through the houses and illuminated the mist, then the backyard became a scene of enchantment, and when a touch of delirium came on, as it would now and then, the cloud-capp'd towers and gorgeous palaces of Shakespeare were nothing to compare with the mystic view. There is much pictorial virtue in mist; even fog may be beautiful in the right place.

I have seen that backyard since on a clear summer day, and all the beauty had vanished with the mystery of the fog and mist. Perhaps also I was in better health.

Corot, the most poetical of the French landscape painters, is said to have seen a great deal to like in a London fog, and I know nothing to surpass in fairy-like beauty a still, misty, silver-grey day in the country, with a dash of sunshine on the foreground.

#### ON INCREASING AND REDUCING DENSITY IN GELATINE NEGATIVES.

BY JOHN BARTLETT.\*

THERE are so many variables in the problem of successful development, that surely there can be no compromise of one's reputation by a candid avowal of a liability to err at times in judging of the proper density of a gelatine negative before fixing.

The personal equation may lead one to fall to either side of the line of photographic perfection. The deflection, it is true, may be only slight, but the consequent lack of vigour or loss of half tones on the negative, after emerging from the hypo bath, naturally causes a regret for the failure to attain the proper limit of the development process. At such times recourse is gladly had to some of the methods for restoration of the lost virtues.

As a prophylactic some have recommended a kind of inoculation of the negative, giving it the very disease dreaded, carrying the intensification in the development to a degree considerably beyond the known point of proper strength, and then resorting to a process of reduction, after fixing it, to obtain the intensity required. But such a plan is wrong in principle; intensification and reduction should be employed only as remedial agents. However, we have found that the *similia similibus curantur* plan may be advantageously pursued with intensification after fixing.

Of all the methods of intensification, perhaps mercury followed by ammonia is most generally employed, but by the method usually followed we are obliged to take whatever degree of strength the mercury may give, so that frequently the negative is made too dense to yield good prints.

The following modification will enable the operator to check the degree of intensification when the proper gradations are obtained. The negative is first immersed in a preliminary reducing bath composed of

Per-chloride of iron (cryst.)	...	...	120 grains
Citric acid	...	...	240 "
Water	...	...	32 oz.

the object of which is to thoroughly clear up the shadows, and to remove any slight traces of fog which, if allowed to remain, would go on increasing, with the intensification, and the last state of that negative would be worse than the first.

The negative is allowed to remain only a few minutes in the bath, which, as we have said, is a powerful reducer, and would totally obliterate the image if the action were long continued. The solution of per-chloride should be rather weak; perhaps it might be better to recommend 50 ounces of water to the above proportions. On removal from the reducing solution the nega-

tive is well washed under a tap, then transferred to the bi-chloride of mercury solution, which may be of any strength from 10 per cent. to saturation. The bi-chloride is difficult to dissolve; a little chloride of ammonium is often added to facilitate solution.

After the film is well bleached it is again thoroughly washed, and placed in a bath of ammonia and water. 1 dr. of ammonia to 4 or 5 ounces of water is quite strong enough. Should the negative now be found to have attained to too great strength, all that is necessary to reduce its obduracy is to re-immerses it in the per-chloride of iron and citric acid solution, and to watch until the gradations of light and shadows are properly represented.

The resultant negative will be found to have greatly improved in appearance and to possess good printing qualities, and probably less liability to change than others mercurialised by the usual method; the per-chloride of iron destroying any trace of hypo which might be present in the film despite the best washing of the plate.

In all processes of intensification and reduction, the chief aim should be to preserve the relation between the lights and the shadows in the negative.

It frequently happens that a method of intensification, though vigorous, operates unequally upon the film, giving the allopathic dose to the high-lights, and the homoeopathic to the shadows, just where strength is most needed. A negative so intensified may be relieved of its former flatness, but the hardness produced is even more objectionable.

To secure by intensification all the fine but latent gradations which the exposure has impressed upon the film—or in other words, to produce an equilibrium of light and shade—the plan of intensification which Mr. John Cassebaum and myself proposed more than a year ago will be found most admirable.

No method known excels in simplicity the silver method, but hitherto the great drawback to its employment with gelatine negatives has been not only the liability to stain the film, but also the tendency to fog the negative.

Its action must be controlled by a previous operation upon the plate, and here comes in the favourable instance of the per-chloride of iron solution, preventing both stain and fog.

A thorough fixing and total elimination of the hypo from the film is absolutely essential if any success is expected with silver intensification.

Per-chloride of iron here comes to our aid, destroying any last trace of this persistent salt.

The negative to be intensified is placed in a bath composed of

Per-chloride of iron	...	...	...	4 grs.
Citric acid	...	...	...	4 "
Water	...	...	...	1 oz.

In warm weather 2 grs. of chromic alum should be added to prevent frilling, but we would rather dispense with it when possible. The plate when in the iron should be kept in motion to secure evenness of deposit.

A few minutes is sufficient to clear up the negative, after which it is thoroughly washed, and subjected to the gallic acid and silver bath, which, having a substructure of chloride to work on, builds up rapidly and evenly, or rather, we should say, the effect of its action is more visible in the weaker parts of the negative, owing to the deposit of the per-chloride of iron acting upon the whole of the film.

Eighty grs. of gallic acid are dissolved in one oz. of alcohol, and the solution kept until all turbidity subsides.

Glycerine may be substituted for the alcohol. Care must be taken to secure a good quality of gallic acid, as upon its purity everything depends.

Next 30 grs. of nitrate of silver are dissolved in 1 oz. of distilled water, and after a good sunning filtered from sediment.

To prepare the intensifier for immediate use take

Silver solution	...	...	1 drachm
Gallic acid solution	...	...	1 "
Water	...	...	1 ounce

Place the negative which has been subjected to the iron solution in a scrupulously clean dish (glass is preferable to rubber), and pour over it the intensifier, keeping the dish in gentle motion to insure uniformity of action on the film.

The negative will tone up gradually. When the desired degree of intensity is secured, the plate is thoroughly washed, and finally dipped in weak hypo solution, again washed, and the operation is complete. The intensity should not be carried too far, because on drying the strength will be found to be greater than it appeared in the wet film. However, the power of the

\* Read before the Society of Amateur Photographers of New York.



reducer is at hand. All that is necessary is to place it in the perchloride of iron solution until the proper degree is restored. Should a slight opalescence appear upon the surface of the film on placing the negative in the silver, it is an indication of insufficient washing from the iron bath. It is not serious, however, and may be generally rubbed off with a piece of wet cotton, and will disappear entirely in the hypo.

The negative should not lie too long in the perchloride solution, as the action is best when confined to the surface of the film.

This method of intensification with silver is not a mere staining of the film with an adactinic colour, but a genuine building up of the image, a superposition of a new image upon the basis of the old one.

It has been in use now for more than a year, and in the hands of careful and cleanly manipulators has given great satisfaction. As to the keeping qualities of the negative so intensified, we shall simply say we have exposed samples to a strong northern light for nearly twelve months without finding any signs of deterioration.

A word in conclusion, about dense negatives.

There is a peculiarity of gelatine plates which makes them a favourite with me; that is, the extraordinary softness obtained with slight over-exposure, and the wealth of detail in the deep shadows; sometimes, it is true—almost latent—yet capable of being brought forth by judicious treatment.

True, the softness may sometimes degenerate into flatness, but I would be inclined to err rather on the side of softness than in the direction of harshness.

In developing a fully-timed plate, we notice that high-lights come up first, then the middle tones, and lastly, the deep shadows. The high-lights, therefore, as a matter of course, have a deeper deposit than the feebler illuminated portions. Sometimes the contrast between the high-lights and the deep shadows is too great, and we feel anxious to apportion the deposit more fairly. We have recourse to reducing agents, but here we must exercise care.

A chemical which acts uniformly upon the high-lights and shadows would not much improve the condition of things; the shadows would go altogether while the high-lights were reducing.

A very weak solution of per-chloride of iron acts first upon the high-lights without affecting the finer details of the shadows.

The best plan is to immerse the negative in a weak solution:—

Perchloride of iron	...	...	...	30 grains
Citric acid	...	...	...	60 "
Water	...	...	...	1 pint

for a minute or two, then wash and pass rapidly through hypo solution, ordinary strength. Be careful not to let the plate remain in the hypo more than a few seconds, as the reduction is very rapid.

The operation may be repeated as often as is necessary, so that the exact degree can be obtained, and the operation stopped at once.

If a strong solution of iron is used, the shadows suffer, the action taking place uniformly on the whole film; but, if a weak solution is employed, the high lights are attacked first. So that really, if judiciously used, the perchloride of iron may be made to improve the flatness of a badly-developed negative, if used strong, giving it more brilliancy by making a greater contrast between the lights and shadows.

### COMPOSITION.

BY G. S. SERSHALL.\*

I KNOW, and doubtless many of you know, that the artist repudiates photography. He puts photography down as a science, that the camera is a machine; he will even go so far as to tell you that art work in photography is more or less accident, as a machine cannot have brains. Although they condemn it with the greatest condemnation, yet they secretly use it (which is nothing more or less than dishonesty). Then as to its being a machine without brains, what about the pencil or brush, may I ask; have they any more brains than a camera? And a photographer has just as much right to make the same statements with regard to the pencil or brush without being considered an idiot. As with an artist, so with regard to the camera. But I am glad to say that artists of the present day do admit that brains

have to be used with the camera as much, if not more, than with the pencil or brush.

Let us consider for a moment what has been the cause of all this, and I think you will find that at the bottom of it all is simply this, that when the glass pictures became known, and the illiterate found they could obtain a camera and a lens for a few pounds, and the *modus operandi* was simple, and combining with that an enormous profit could be obtained, and at the same time the teeming thousands of poor artisans who up to that period had been debarred the luxury of having the slightest memento of any dear friend or relative, rushed with their shillings to the impostors of those days, who palmed upon them the vilest of rubbish; but I am glad to say that this is a matter of the past, and, what is more, will never be revived again, because education has become compulsory, and art is to be introduced, and with its refining influence vulgarity will stand no chance; and the poorest artisan will never be satisfied to spend his money in such rubbish.

Now, under such circumstances, how was it possible for photography to be accepted as art, much less as high art; and was it surprising that artists condemned it *in toto*? Now having passed through all this, how does photography stand at the present day? Pre-eminently first of all arts. As a decorative art, as a pictorial art, both as regards portraiture and landscape, and for book illustrating, nothing can touch it. Again, photographs, especially if they be instantaneous, may be directly copied, and I know for a fact are copied by professional artists, and sent into the market as their own original studies from nature. Good photographs are always instructive, the drawing is so beautifully correct in detail. After turning over many, if they be well selected, it feels almost impossible to look at sketches, except by the very first masters. It is said that a photograph cannot lie; this is certainly not a fact. A representation of nature, to be good, must be true in relative values of light and shade, as well as true in drawing. Now in the former, particular photographs are very wrong indeed. The clearer the air and brighter the colours, the farther from nature they are. For example, a bright orange dress against an intense blue door will look like a dark dress against a pale door. But with all these faults a great service has been done to art by photography. The public are more critical in the matter of character and drawing, and are better able to weed out the bad pictures from the good.

At one time artists used to take liberties with nature in a way that would not be permitted for a moment now. The great arch liberty-taker was Turner. He would put the sun, moon, and stars into one sky, if it helped his composition, and the reason of his success was his great knowledge of composition. Now if two artists choose the same subject, as frequently happens at well-known places abroad, and both are conscientious workers, it is, nevertheless, very unlikely that they will produce pictures at all like one another; though both may be equally like nature, generally one will be much better in composition than the other, simply because the artist who did it knew most about composition, and therefore chose his position best. This is even more the case with photography than sketching. We frequently see photographs of places that form the most charming pictures, but more frequently we find them not forming any picture at all, though we know their subjects to be beautiful. A knowledge of composition is very important, and even a few rules are very useful, although I do not intend to weary you with a lot of bygone and far-fetched notions, as for instance, points in a picture. There is an old antiquated theory of dividing the picture into a number of points, and one I believe is forty. Imagine dividing a picture into that number of points, and then having to go over all those points, and to say, this is a weak point, this is a better point, but this one is the best, and so on, &c.

Now with regard to the points, all I have to say about them is this, and I think all connected with art (and of course I bring photography under that heading) know that the centre of a picture is its weakest point; beyond this, I think, instead of helping, these far-fetched theories only tend to confuse, and often cause beginners to refrain from, and even object to, having anything to do with it, on account, as they think, of the matter being too complicated; and, consequently, say to themselves, I shan't trouble about it, but when I see anything that pleases me shall take it. Now if there are any present who entertain this idea, allow me to disabuse your mind of such, for although there is a little difficulty, it is not a formidable one, and I will now try to explain the two principal ones, and if I can, for your better understanding, will illustrate the two principles. The most pleasing compositions are those where the masses do not

\* Abstract of a paper read before the Birmingham Photographic Society.



balance each other, but the smallest mass should have the greatest interest. Two of the simplest forms of composition may be seen in an egg laid sideways, and illuminated by one point of light. Now, in the first place, let us get the strongest light to fall on the front and a little to one of the sides. This will be the strongest light, and from there everything will graduate into shade. The under-surface will be much the darkest, although the extreme edge will begin to fade off again into half



DARK ENCIRCLING LIGHT.



LIGHT ENCIRCLING DARK.

light. Now remove the light and place it at the back of the egg. You will find the edges to be the lightest, and the darkest point will be more or less central. This is self-evident, then, that in the first illustration we have the sun in front of the picture or behind the spectator, and the picture produced will be in full daylight; the second is when the sun is behind the picture and in front of spectator, and represents twilight.

Again, when the composition of the ground is unavoidably one-sided—as in almost any view of Gibraltar, for example—interest must be given so as to balance the ponderous mass of rock by means of clouds or figures, or both. The great use of foreground figures is to add an interest to the picture in the right place. A picture or sketch may be composed by lines as well as mass, such as Calais Pier and many others by Turner. The lines should always be in curves that have a tendency to run to two balancing points. The curves should, if possible, never be a part of a circle, but be some irregular yet true curves tending towards part of ellipse. To form a good composition, not only the masses, combined with interest, must balance, but the light should be as much concentrated as possible upon one point, and the shadow on another; therefore my reason for selecting the egg as an example to illustrate this principle. Of course we must not bind ourselves rigidly to anything, for all rules must be a little elastic. Of course when the greatest dark and highest light come in juxtaposition, the strongest effect is produced in a picture, yet this should be got naturally, not artificially.

Some of the easiest things for grouping are boats and ships on the sea. The different colours of the sails and hulls permit the lights and darks to be grouped, even when everything is in the full glare of the sun. The play of light on the water, the forms of the waves if the sea is rough, and the reflections when it is smooth, all lend themselves easily to grouping of the most complicated and delicate kind. In all compositions there should be one chief point of interest. If it is large, there is no limit to the number of subsidiary points of interest, graduating from the principal one down to those that are of very small value. In former times nature never seemed enough for the artist. He always tried to add to it, to make it richer than he found it. Now we know a picture may have all the requirements of a good composition, and yet may be perfectly natural. The great spread of instantaneous photography has made this abundantly plain. If we look over a number of instantaneous photographs, we may pick out many that in composition and effect are beautiful pictures, and there is no possibility of contrivance in these, as there is when the incidents are arranged for the slower processes of photography. It is curious to notice how the less the figures are aware that they are being taken—in other words, the more natural the composition is—the more beautiful it often becomes. Not but what there are many more examples of bad than good composition, but where it is good it has a charm about it that is only possessed by the works of the greatest masters.

In conclusion, allow me to refer for a short time to the selection of a subject. It is strange what a long time it takes before the beginner can learn to choose a subject that composes well. Details attract him too much, the surroundings, general form, and curvature of lines are overlooked, and then he is surprised when he develops his plate to see how poor and uninteresting a picture he has got. He should always regard general grouping first, and special interest of detail later. An admirable way of

doing this is to half close the eyes, which causes the general grouping of lines, and light, shade, and colour, to become more easily visible, on account of the attention not being drawn off by the detail. Sometimes you may have a subject that, to all appearance, would make an excellent picture; yet, on careful consideration, you find that it does not altogether please you. Supposing it to be a fine bit of heather in full bloom, with perhaps some cottages and fir trees at a little distance, rather on one side, and distant hills beyond, the cause may be that all the interest is one-sided. Now this selection may be very good. What is it, then, that is wanting? Why, the carrying of the interest through the picture. Well, you say, how is that to be done? By the introduction of figures. For instance, a man with a donkey and cart, or any rustic figures suitable to the scene. You may say, Suppose we cannot get the donkey and cart or the rustic figures? Well, then, my advice is, don't take the picture; or, in other words, don't waste a plate, for if you do, depend upon it, you will never care for the picture. The French consider a landscape is no picture unless there are three planes or parts: the first plane, or foreground; the second plane, or middle distance; the third plane, or extreme distance. If the third plane be missing, a close and shut-in feeling is produced. A little peep of distance should be got in somehow. If the second plane is not seen, the effect is theatrical. If the first plane or foreground is omitted, all strength goes out of the picture.

Lastly, if both the second and the third planes are wanting, you have neither landscape or picture, it is only a study. The advice of a celebrated picture-dealer to a young landscape artist was, "Never paint a picture with a shut-in composition. People inside rooms like to have pictures which, when they look at, they can imagine themselves seeing out of to something bright and fresh beyond." To choose a subject well, you should perpetually think of how it will compose either with or without the accessories of figures or strong effect. The most interesting photographs are those which depend upon effect or figures for their strength. Figures play so important a part in composition that it would be impossible for me to do justice to myself or to be of any advantage to you without devoting another paper to the subject.

#### CAMERA CLUB.\*

##### DISCUSSION ON THE SUBJECT OF REGULATIONS FOR PHOTOGRAPHIC EXHIBITIONS.

###### Sheffield Photographic Society.

Length of notice.—Three months.

Previous announcement of judges.—None necessary.

Judges for artistic or technical knowledge.—For both.

Awards or no awards; system of first, second, and third prizes.—

First, second, third, and extra.

Practice of frequent exhibition of same picture.—For one year from first time of exhibit.

Limit of number of pictures or wall space for each exhibitor.—Ten feet only.

How much to be done by the exhibitor.—All.

General remarks.—No charge for wall space.

###### Sutton Society.

Length of notice.—As long as possible.

Previous announcement of judges.—Should be announced previously.

Judges for artistic or technical knowledge.—The art section artists to preponderate.

Class: in sizes or subject, or technical and artistic.—Subject and sub-division in sizes.

Awards or no awards; system of first, second, and third prizes.—First, second, and third.

Practice of frequent exhibition of same picture.—Committee divided.

Limit of number of pictures or wall space for each exhibitor.—Must depend on circumstances.

How much to be done by exhibitor.—All, except preparing plates, paper, mounting, and framing.

General remarks.—Charges per square foot; pictures to be hung in each class together.

###### Wallasey Photographic Association.

Length of notice.—Six months.

Previous announcement of judges.—Desirable, to give confidence to exhibitors.

\* Continued from page 278.



Judges for technical or artistic knowledge.—In art section preponderance of artists.

Class: in subject, or sizes, or technical and artistic.—Subject and sub-divisions into sizes.

Awards or no awards; system of first, second, and third prizes.—Awards in all cases, say first, second, and third.

Practice of frequent exhibition of same picture.—Only where special class provided.

Limit of number of pictures or wall space for each exhibitor.—No limit.

How much to be done by the exhibitor.—All mounting and framing excepted.

General remarks.—Charges, 2s. 6d. per square foot; total charge not to exceed 5s.

*Mr. E. W. Alabone.*

Previous announcement of judges.—Certainly not.

Appointment of judges.—Certainly. Photographers in artistic section.

Class in sizes or subject, or technical and artistic.—Divisions in both sections. Pictures of same size should compete together.

Awards or no awards: system of first, second, and third prizes.—Awards bring out better work, exhibitor being put on his mettle. If no awards, then poorer work sent in. Prizes, first, second, and third.

Practice of frequent exhibition of medalled pictures in competition.—Prohibited after gaining two prize medals, excepting in a class specially for medalled pictures.

How much of the work exhibited to be done by exhibitor.—Whole of the work.

*Mr. H. B. Berkeley.*

Previous announcement of judges.—Should be announced beforehand, to give confidence to exhibitors or otherwise.

Appointment of judges.—In art section, say five—three artists, two photographers. In scientific section, tried scientific men, say three—two for knowledge of photographic science.

Class in sizes or subject, or technical and artistic.—Division into art and science sections feasible. Size no object; the artistic effect to be sought for.

Awards or no awards: system of first, second, and third prizes.—Awards not objectionable, and are an incentive to good work. Should be of equal value, and not too numerous. Should be diplomas rather than baits.

Practice of frequent exhibition of medalled pictures in composition.—1. Not advisable to encourage the sending for competition of a prize picture to many exhibitions after its merits have been fully recognised. 2. Probably to many exhibitions held in the same year giving medals.

## Patent Intelligence.

### Applications for Letters Patent.

9283. THOMAS WILLIAM HARVEY, 52, Chancery Lane, London, for "Improvements in portable photographic developing boxes."—[Complete Specification.]—June 26th, 1883.

Patent which has become Void through Non-payment of Duty.

4989 of 1884. STURROCK, J.—Changing sensitized plates.

5134 of 1884. DE ROUX, L.—Engraving by photography.

### Specifications Published.

12,168. GUSTAVE BAY, of 22 Rue de la Chaussée d'Antin, Paris, France, Chemist, for "A new or improved process for obtaining positive black line copies from positive tracings or negatives by the action of light."—Dated 8th September, 1887.

I prepare a paper with a solution of gum arabic, tartaric acid, and perchloride of iron; I leave it to dry, and afterwards I expose it in a photographic frame under an Indian ink tracing or any other suitable negative; on taking it out of the frame I develop the copy upon a bath of water saturated with prussiate of potash, after which I place it upon a bath consisting of a decoction or infusion of colouring matter. When the lines of the copy are quite black, I wash the copy under a water-tap, after which I dip the sheet in a bath consisting of a salt of soda, ammonia, potash, &c. The degree of saturation is a matter of little importance, provided the salt is neutral and has an acid action with an alkaline reaction. The acid clears the ground, whilst the alkaline matter destroys the blue produced by the salt of iron and the

prussiate, and fixes the copy by means of the precipitate with the colouring matter, either in violet, brown, or black, according to the salt used, and the duration of the bath. I finally wash under a tap, with brush and plenty of water. The baths may be used until ineffective.

I can also obtain copies by a single bath of about half of prussiate and half colouring matter, the development of the copy being my guide in the matter.

On taking the sheet out of the frame, I place it for five or ten minutes upon this bath, after which I wash it with a brush. The copy will then appear black upon a yellowish ground, which I can subsequently clean and bleach by means of a bath of alkaline salt.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

The production of a direct positive black line copy on a white ground of previously sensitized paper, such copy being obtained by means of an Indian ink tracing by the action of light, by, 1st, the combination of the yellow, red, and brown vegetable colouring matters, with the precipitate formed by persalts (salts at the maximum of strength) of iron and prussiates of potash; and, 2nd, the cleaning and bleaching of the ground of the copy by a solution of neutral salts having an acid action, and at the same time an alkaline reaction, substantially as described.

## Correspondence.

### THE FACE, IN DEFAULT OF THE FINGERS, FOR EFFECTIVE IDENTIFICATION.

SIR.—It might be at once conceded that the factors of identification exist more abundantly upon the hand than upon the face. But, having admitted thus much, of what practical value is the concession? Portraits of the hand! In reluctant response to the irresistible mandate of the governor of Her Majesty's jails, they may, of course, continue to put in an occasional appearance, but an independent existence they will maintain—never. Certainly, in no case can they be so sufficiently to the front as to fill the vacant niche in medical jurisprudence—identification by photography.

Facial admeasurement, therefore, must take the inevitable lead. "*Aut Cæsar, aut nullus.*" Hence it becomes the more to be desired that definite views should prevail, and that the reliability of the *modus operandi* should be unimpeachably established.

It is greatly to the credit of the PHOTOGRAPHIC NEWS that its columns have always been accessible to the expression of opinion upon this topic, even when linked with certain personal associations discredited in the Law Courts, and which the *beau monde* has voted to be more tiresome than the "Irish question." Much remains, however, to be achieved before authoritative statements and accepted facts can be recorded in the text-books of the medical jurists. The proximate date of facial maturity; the reliable permanency of the frontal fabric; the routine of external mutations; the ethnological factors of diversity; the minor variants of this or that feature; the indubitable efficiency of the unit of the admeasurement. These matters have severally to be discussed, and subjected to investigation and experiment.

I confess my personal inability to deal at large with the topics indicated. I desire merely to suggest them as being worthy of serious attention from those within whose scope they may more immediately lie. I shall offer but a few passing comments upon the items denoted.

The desirability of acquiring authentic data in respect of growth and mutation, even at the earliest periods of life, is accentuated by the numerous "modern instances" of kidnapping. The "Little Charlie" of American notoriety could never again establish his identity, were he never so true.

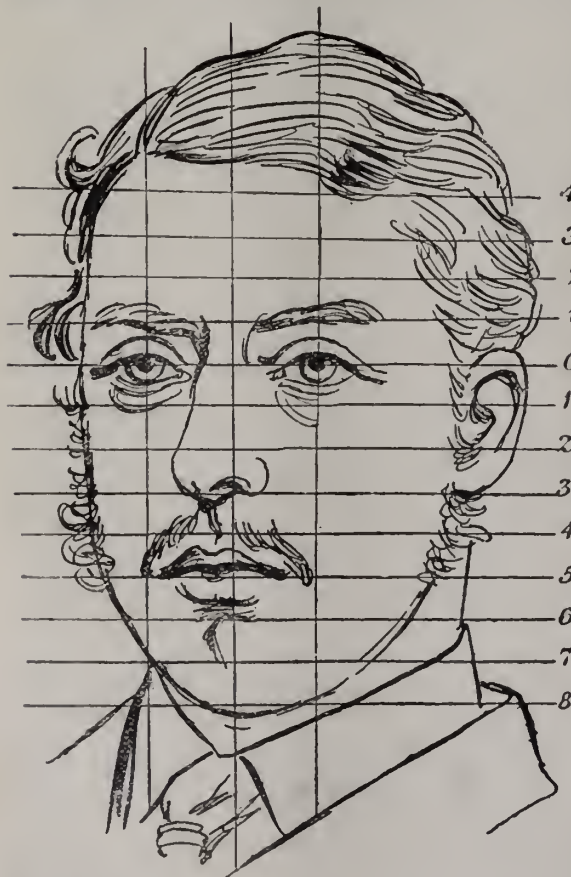
It is generally held that men have attained their natural stature about the age of twenty-four. It may, in addition, be desirable to ascertain to what appreciable extent



difference of facial dimensions ensues between the ages of, say, fourteen and twenty-four. In the celebrated Tichborne case the differences to be determined lay between portraits taken at the age of twenty-five, and those taken at the age of forty and onward. During subsequent life—excepting from the loss of teeth, which would deduct proportionately from the depth of the chin—no appreciable change in the osseous fabric can be theoretically assumed.

Externally, appearances may differ much; but in that case the issues raised are mostly those of beard or no beard, fat cheeks or lean cheeks, blotches, wrinkles, and crow's feet; or no blotches, wrinkles, and crow's feet. Now, without doubt, fatness in lieu of leanness produces a very perceptible difference to the eye, and with superficial observers might invalidate the admeasurement. But such must be reminded that superior plumpness constitutes simply a straight-out projection, that adds not a fraction to the flat surface of the picture. Within the boundaries of the area measured, the same identical proportions and distances subsist between the eyes, the lips, and the chin. In a photograph—whether the object be as rotund as a globe or as flat as a dinner plate—no possible difference can ensue if the diameters are in agreement.

Here, perhaps, I may suitably pause, leaving to a future opportunity some of the additional and more vital of the issues involved. The portrait here appended will answer



fairly well the purpose of illustrating the principles of the admeasurement.

It will be seen that through the exact centre of the pupils a line is drawn, from side to side (marked 0 in the portrait); and thus is secured the first necessity, a valid horizontal, and a basis for all further operations. Bringing the distance between the centres of the pupils to our aid, we next strike intersecting arcs above and below the hori-

zontal; upon these arcs being connected by a line passing through the points of their intersection, we arrive at the indispensable requisite, the true perpendicular and natural poise of the head, as it variously exists in each portrait.

That feature of the operation having been carefully effected, we proceed with equal care to mark off the lines representing the diameter of the iris, upward and downward—starting always from the centre of the pupils.

Clifton, Bristol.

W. MATTHEWS.

## Proceedings of Societies.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE annual meeting of the Association was held on the 28th ult., F. A BRIDGE in the chair.

The Hon. Sec. (J. J. Briginshaw) read the annual report.

"It is with much satisfaction that at the outset the members are assured of the continued progress and prosperity of the Association. [The Balance Sheet was submitted, showing the receipts and expenditure for the past year.] At the early part of the year just passed a sub-committee was appointed by the members to revise the rules of the Association, and to report upon the same at a subsequent meeting of the members. The report of this sub-committee stated that, after much deliberation, it was resolved to recommend an alteration of Rule 8, which set forth that there should be no permanent committee, the conduct of the affairs of the Association having been since its formation under the direction of the whole body of the members acting as a committee. It was thought by the sub-committee that the time had arrived for the appointment of a permanent committee which should be charged with the management of the affairs of the Association. Some opposition to this change in the constitution of the Association was incurred, and the annual meeting was adjourned for one month. The subject was then again discussed, and ultimately, on the understanding that the proposed change should be in force for the one year only, the motion was carried, and the new rules adopted. Many excellent and important papers have been read before the Association during the past year. The keen interest taken in all matters pertaining to the optical lantern is still maintained, and the evenings set apart for the exhibition of transparencies have been well attended. The displays on these occasions have been both recreative and instructive. The exhibition of hand-painted slides was especially interesting as affording a comparison of the best hand-work of the past with the slides of the present day. Mention must also be made of a series of slides from negatives taken by C. M. Woodford, Esq., of Gravesend, during an exploration of the Solomon Islands, and shown by kind permission of this gentleman by Mr. Freshwater. It is with regret that the loss by death of a prominent member of the Association has to be recorded. Mr. Norman Macbeth, although only associated with the Association but a short time, proved a valuable and energetic member. Distinguished for abilities which secured him honour in his profession, he was ever labouring to inculcate the principles of art among photographers, at the same time his kind and genial disposition won esteem from all with whom he had to do. It is also a matter of much regret that in consequence of ill-health, Mr. A. L. Henderson, the founder of the Association, has been compelled to withdraw from active participation in the work. Appreciative thanks are due to the proprietors of the *British Journal of Photography*, the *Photographic News*, *Anthony's Bulletin*, and the *Photographic Times*, for the regular supply of these publications for the use of the members. [A list of papers read, which have duly appeared in our columns, followed.] The zeal with which every stage in the progress of photography is followed up remains unabated. Rapid, however, as has been its rise in the past, there is still much material for experiment, absorbing the energies and leading to practical enquiry. The functions of a society are thus brought prominently into use, and the benefits derived from discussion and demonstration are readily recognised. So the active and earnest work which have throughout been the characteristics of this Society may be attributable to the large accession of members during the past year, the number of members now on its roll being the highest since the formation of the Association, a fact that may well inspire confidence in the future; but this confidence can only be maintained by continued and earnest individual work. Let every member then vie with each other in maintaining its



prestige, that as each year rolls on its vitality and vigour may remain unimpaired, and the steady progress of the past fully maintained in the future."

On the motion of A. COWAN, seconded by S. G. WOLLASTON, the report was adopted.

The following were elected officers for the ensuing year:—

*Trustees*—J. Traill Taylor, J. B. E. Wellington.

*Curator*—A. Haddon.

*Treasurer*—W. Prestwich. *Hon. Sec.*—J. J. Briginshaw

The vote having been taken as to the election of a committee and carried, the following members were then appointed to constitute the committee:—H. D. Atkinson, F. P. Cembrano, E. Clifton, F. A. Bridge, P. Everitt, L. Medland, H. Trinks, J. J. Collins.

A discussion followed as to the advisability of revising several of the rules of which due notice had been given.

A vote of thanks was passed to the officers for their services during the past year.

A. Smith was elected a member of the Association.

#### BIRMINGHAM PHOTOGRAPHIC SOCIETY.

A MEETING was held at the Technical Schools, Bridge Street, on June 28th, 1888, W. J. HARRISON in the chair.

The Question-Box contained: "Does the addition of citric acid to the pyro and ammonia developer act as a restrainer and enable you to get a negative of full printing intensity?"

W. J. HARRISON: Yes. It forms citrate of ammonia.

A. PUMPHREY: All restrainers do not give vigour and density; it is the pyro that gives density.

Several exhibits of photographs were shown, including prints on Scholzig paper, which had been kept for two years before printing (without spoiling). A number of views of Italy (12 by 10) taken by A. Pumphrey on his films; pictures of carriages, Buenos Ayres Railway, by W. Taylor; and shutters and new dark slides, by S. Delicate.

G. S. SERSHALL then delivered his paper on "Composition" (see page 427), illustrating his remarks by charcoal drawings on the boards.

In the discussion which followed, A. Pumphrey said, the paper just read was one of the best the Society had heard on this subject, and remarked that photography's best point was detail.

The CHAIRMAN thought all amateurs should see "Sutcliffe's Studies."

MR. SERSHALL: Get the foreground sharp, and do not curtail the breadth of the picture.

B. KARLESE: Since Mr. Foster's paper on a similar subject, he had studied composition in his photographs. Last week he walked about for a day, and only exposed three plates. He suggested that the Council be asked to make a competition for "Composition" on a distant subject in a district to be named, and that an artist be invited to act as judge of same.

The lecturer promised to give a paper at a future date on "Figure Composition."

The HON. SECRETARY announced that Mr. H. Horton promised a paper on "Daguerreotype" for next session, and asked for additional papers from members.

E. C. MIDDLETON (who had recently visited the principal "photo-mechanical" establishments on the Continent) made a few remarks on his experiences, dwelling more particularly upon a stay of a few days at the Imperial School of Photography at Vienna, strongly commenting upon the neighbourhood of Salzburg as an unrivalled district for a prolonged stay with the camera. He mentioned that Messrs. Angerer and Goeschl, Messrs. Winter, and Edmund Sierger, of Vienna, had kindly promised to send examples of the various branches of photography (which these firms practise so ably) for exhibition at the forthcoming Convention, while Dr. Liesegang and Dr. Eder both promised papers for that meeting.

The CHAIRMAN announced that the next meeting will be held on July 19 instead of July 26, in consequence of the Convention falling on the latter date.

#### LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting was held on the 28th ult., at the Royal Institution, Colquitt Street, B. J. SAYCE in the chair.

Alexander Carson, J. Miller Munn, and George M. Noakes were elected members.

The HON. SECRETARY called attention to communications from the Oldham Corporation Art Gallery, and from the Hon. Secretary of the Cardiff Amateur Photographic Society, announcing

forthcoming exhibitions, and inviting contributions; also to the report of the Royal Meteorological Society on photographs of lightning flashes, inviting attention of members to the autotype prints of flashes, and requesting their co-operation in further experiments.

S. DELICATE's dark slide and shutter were then exhibited, which excited some interest; the shutter, in particular, being very ingenious.

PAUL LANGE advised the use of a toning solution formula which he had had printed for circulation among the members. It consists of a stock solution containing

Sodium acetate...	...	...	180 grains
Sodium bicarbonate...	...	...	90 "
Borax...	...	...	330 "
Distilled water...	...	...	4 pints

The toning bath is composed of 5 ounces of stock solution; gold chloride, 1 grain; mixed two hours before using. He described this bath as avoiding most toning difficulties, and giving very fine tones, more particularly by mixing old bath and stock solution in equal parts.

B. J. SAYCE recommended the borax toning bath, and showed prints toned with it which were all that could be desired.

The discussion on the hydroquinone developer was resumed.

B. BOOTHROYD had made some successful trials, and exhibited negatives resulting with Johnson's hydroquinone, using the formula given in "Wall's Dictionary," viz.—

No. 1.—Hydroquinone...	...	...	60 grains
Metabisulphite of potash...	...	...	240 "
Distilled water (to make)...	...	...	8 ounces
No. 2.—Carbonate of soda...	...	...	240 grains
Carbonate of potash...	...	...	240 "
Distilled water (to make)...	...	...	8 ounces

Taking Solution 1, one ounce; Solution 2, two ounces. He used Thomas's plates, and got very good negatives in ten minutes.

The HON. SECRETARY pointed out the difference between crystal carbonate of soda and ordinary crystallised carbonate or washing soda; the former was a trade term for a carbonate containing only one equivalent of water, whereas ordinary crystals contain ten equivalents: 124 parts of the former have the same strength as 286 of the latter. He thought mistakes might easily arise if any one unwittingly got hold of the crystal carbonate. For instance, the developer of which Dr. Kenyon gave the formula stated 4 ounces of crystal carbonate; if washing soda was meant, 12½ drachms of monohydrated crystals would have the same strength.

Dr. KENYON stated that ordinary crystals were intended.

R. CROWE showed two prints from negatives developed with pyro, to show the greater speed of development of pyro as compared with hydroquinone. They received short exposures by a Newman's shutter, one sixty-fourth of a second, lens at f, and took only one minute in development.

Mr. LANGE announced that the river excursion would take place on July 21, leaving the landing stage at half-past two p.m. A steamer had been secured for exclusive use of the party, tickets two shillings each. He requested that names should be sent in to him early.

A question was found in the box: "How to treat bromide prints that obstinately adhere to the glass or ferrotype plate after drying?"

It was suggested to wash off with a nearly saturated solution of carbonate of soda.

Dr. KENYON said the remedy was to alum after fixing.

It appeared, upon enquiry, that the questioner had omitted the use of alum.

### Talk in the Studio.

UTILISATION OF THE SUN'S HEAT.—Professor Morse, of Salem, Massachusetts, has devised an ingenious method of utilising the heat of the sun. He places out-do a building, in such a position that the sun shines directly upon it, a shallow box, the bottom of which is of corrugated iron, and the top of glass; the heat rays of the sun pass through the glass, and are absorbed by the iron, heating it to a high temperature, and by a system of ventilation a current of air is passed through the apparatus and into the room to be heated. It is stated that by this means the air has been heated on sunny days to about 90 deg. Fahr.—*Scientific News*.



**PHOTOGRAPHING ANTIQUITIES AND OBJECTS OF ART.**—A correspondent writes: "Very little help seems usually given in journals and manuals towards photographing small objects—say plate, jewellery, antiquities, manuscripts—which it is often required to copy at nearly equal dimensions with the originals, and under difficulties as to lighting, &c. I scarcely venture to suggest that a series of papers in your columns on this subject would be most useful; all the more so that photographers, whose usual line is portraiture, are occasionally called upon to make reproductions of the kind in question, and are often at fault through want of familiarity with the kind of work, and the difficulties under which it often has to be performed. The lens, stop, lighting, exposure, kinds of plates and developer, might receive consideration, and the remarks of the experienced on the subject would, I am inclined to believe, be welcomed by many."

**AN ALBUM FOR A PROVINCIAL MAYOR.**—J. Zachsdorf, of York Street, Covent Garden, has just bound for presentation to the Mayor of Leicester, a large quarto album containing upwards of 300 cabinet photographs of children dressed in fancy costumes, who were present at a ball given by the Mayor on the occasion of his golden wedding. The photos were taken by local photographers, and are, on the whole, excellent. The book has been elaborately bound in morocco, with the Mayor's arms laid inside.

**THE GLASGOW EXHIBITION.**—Our contributor of page 402 (last week) sends the following supplementary remarks: "Two important contributions from two representative men were inadvertently overlooked in my previous notice: I refer to the specimens shown by Obernetter, of Munich (2335), and Otto, of Dusseldorf (2392 B). The former has two large panels, covered with reproductions obtained by means of his photogravure method, which differs from the general process adopted, being what may be termed an etching one. A chloride of silver image is laid down on a copper plate, and under the influence of an electric current the chloride is decomposed, the chloride uniting with the copper, thus etching the plate to a greater or less extent, according to the deposit present. The resulting print is very delicate. In the reproduction of coloured originals it is understood that Obernetter has made use of orthochromatic plates for some considerable time. A short *resumé* of Obernetter's method will be found in the *PHOTOGRAPHIC YEAR-BOOK* for 1885, under an article "Photography and Photo-Engraving in Munich," contributed by Dr. Vogel. Otto's *lichtdruck* work is particularly fine. Want of space prevented the greater portion of this clever operator's work forwarded being shown, but enough is presented for those interested to be able to judge of its quality. Otto uses largely the electric light in his operations, all his printing plates being obtained by this means; he is thus independent of solar light, and can carry on his work continuously. It is a significant fact that not a single specimen of collotype work is to be found in the gallery which has been produced in our own country. The Photophare Co. have some excellent mechanical prints (2161 and 2338), but they say their process is not collotype. In frame 2161 there are some prints finished to imitate the ordinary silver print, and very good imitations they are; we consider them well worthy of a careful inspection."

**DELETERIOUS MOUNTS—A CAUTION—PRESENCE OF A SOLUBLE DYE.**—We have had complaints of a new kind of deleterious mount. It is of a dark chocolate colour, and contains a soluble red colouring matter, which permeates the print more or less rapidly according to the softness of the paper and the amount of moisture used in mounting. These mounts may be recognised by soaking in water, and then leaving under pressure with white paper on each side.

**"PATENT COLOUR PROCESS" IN PHOTOGRAPHY—A REMARKABLE CIRCULAR.**—Judging from the heading of the following, which is being sent to provincial photographers, it seems that Mayall's "Patent Colour Process" has met with that amount of success which is involved in finding persons willing to form a limited company to acquire it. We should scarcely, however, have expected that it would be thought worth while to address offers to professional photographers; whatever effect such announcements as that the process is one for the "production of permanent photographs," "colouring the photograph by the use of chemical affinities, having intimate relation to the action of the colours of the object photographed upon the photographic film, &c.," may have had upon the outside public, either as customers or investors:—"PATENT COLOUR PROCESS.—DEAR SIR,—As I understand you occupy a leading position as photographer at —, I am requested by my Directors to bring their patent process of Coloured Photography to your notice, and to ask you if you

desire to acquire a license from the Company to work the process in your town, as they are now prepared to issue licenses for a yearly payment, or to compound this for a lump sum as may best suit your convenience. Specimens of this marvellously beautiful process can be seen, and all necessary information obtained at the Company's premises, 164, New Bond Street. The favour of an early reply to this will be esteemed.—Yours faithfully, H. SANDERS CLARK, *Secretary*." It will be seen that information concerning the process is to be obtained at New Bond Street. If any of our readers are not already acquainted with the nature of Mayall's claim, they may find what information they may require in our columns for last year, pages 379, 401, 430, and 437.

**PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.**—A special meeting was held on June 20th, for the purpose of taking suitable action in regard to the sudden death of S. Fisher Corlies, late Treasurer of the Society. President Graff occupied the chair, and briefly announced the object of the meeting. In addition to an intimate personal friendship with Mr. Corlies, he had been associated with him as a member of this Society since the date of its organization in 1862. He never knew a better nor a more unselfish man. Always ready and glad to impart to others any knowledge he had acquired, he was truly a friend to every one, and had no enemies. His duties in this and all other organizations were always conscientiously and thoroughly performed. Letters were read by the secretary from Edward L. Wilson, of New York, and Charles R. Panoast, of Waterbury, expressing deep regard for their deceased fellow member, and mourning his loss. The following minute was ordered to be entered upon the records of the Society:—"The Photographic Society of Philadelphia have heard with deep regret of the death of their late fellow member, S. Fisher Corlies. Connected with this Society from its organization, its Treasurer for over a quarter of a century; constant in his attendance at its meetings; firm and decided in his views, yet ever considerate of the opinions of others; always ready to aid with his sympathy and counsel; his genial, unselfish nature endeared him to all, and made his influence—quiet and unassuming though it was—most potent for good in the history of the Society. Through years passed in his companionship we recall many pleasant recollections of his love for nature and all that is pure and beautiful; his skill in photography has left us with treasured mementos of happy hours passed with him, never to be forgotten. His death has cast a feeling of profound sorrow over this Society, and while we bow with reverence to the Almighty Power that has taken away our beloved member, we turn to his sorrowing family and respectfully offer our heartfelt sympathy in their irreparable loss." Samuel M. Fox was appointed Treasurer *pro tem.* for the unexpired term of Mr. Corlies, or until a regular election can be held.

**PHOTOGRAPHIC CLUB.**—The subject for discussion on July 11th will be "Print and Plate Washing." Saturday outing at Wimbledon Park.

## To Correspondents.

**FRANCAISE.**—Your best way will be to state the alternative wants in an advertisement, and you will make your final determination after personal interview with the persons responding.

**PHOTARGUS.**—For this work you should avoid anything like a wide angle lens, but should use one of long focus. There is, however, the disadvantage that you will require an extremely long camera; perhaps the best thing will be to get a series of lengthening pieces made. You should obtain your lens from one of the best makers for the kind of work.

**GEO. MANLY.**—The process has been described both in the *News* and *Year-Books*, and an extra sensitive bitumen solution is sold ready made by Romain Talbot, of August Strasse, Berlin. All the other materials can be obtained of any large chemical house.

**H. ANDERSON.**—The directions we gave should be quite sufficient, and the special preparations can be had from Harold Senior, 88, Norwood Road, S.E.

**T. K. BIDDLE.**—The cards are quite unfit for mounting photographs on, by reason of containing a soluble red colouring matter which permeates the prints. Send them back, and demand compensation for all losses you have incurred through the use of the mounts.

**GLUTTON.**—It depends so much on the quality of work desired, that no satisfactory estimate can be given. High-class work demands careful attention to each, and the production of large numbers in a short time is out of the question.

**W. LANG.**—To hand; thanks.



# THE PHOTOGRAPHIC NEWS.



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### ANOTHER YELLOW LIGHT FOR THE DARK ROOM.

In a recent number of the *Wochenblatt*, J. Gaedicke describes a light, for the purpose of conducting photographic manipulations, that certainly appears to possess some decided advantages. He sets out with a statement that anyone who has to remain for several hours in the day in a dark room illuminated by red light, soon feels an injurious effect upon the eyes and nerves. This statement will, probably, meet with general acquiescence, although some are found who say that they have felt no ill effect from prolonged work under these conditions. Gaedicke considers that a proof of its generally injurious influence is to be found that with some people—especially the female sex—fainting fits are induced when undergoing the process of becoming accustomed to a lengthened stay in work-rooms illuminated by red light.

On account of this evil effect upon the health, which he had personally experienced from the red-light room, Herr Gaedicke determined upon making experiments to find a better light, starting with the fact that the nearer the character of the light is to that found at the red end of the spectrum, the less is its photographic effect. It is interesting to note that he has, nevertheless, arrived at the result of using a yellow light as the safest in proportion to the illuminating power to the eye, a conclusion which has previously been come to by other workers. His means of obtaining the yellow light are, however, not the same as those that have been generally adopted, and, judging from the comparative safety which his experiments have proved the particular method he uses to enjoy over that possessed by a red illumination, his method is certainly worthy of trial, and perhaps of general adoption.

Briefly stated, Gaedicke's method is the use of the sodium yellow light, means being employed to filter out the extraneous rays proceeding from the flame of the Bunsen burner used to inflame the sodium. A preliminary experiment made with the sodium flame in an unshielded Bunsen burner, showed a very decided actinic effect. A sensitive gelatine plate exposed for one minute under a sensitometer at a distance of about 13½ inches from such a flame gave upon development No. 11, whilst the No. 8 was very powerfully rendered. This action, which corresponded with that given out by a stearin candle at about double the distance, was so powerful that it could not be attributed to the sodium light, and he therefore repeated the experiment with the Bunsen flame alone, without sodium. It was found upon development that the same numbers showed upon the sensitometer that had appeared when the flame contained sodium, and the inference was obvious that the photographic action proceeded not from the sodium yellow, but from the Bunsen flame which was used to obtain it. It therefore became necessary to find a filter that would stop as many of the actinic rays as possible,

consistently with absorbing as little as might be of the sodium yellow light which it was desired to let pass.

After various experiments with silver flashed glass, a pot metal glass, which owed its yellow colouration to iron, was found, which well fulfilled the desired end, and it was used in the form of a chimney surrounding the Bunsen sodium flame. The lamp was then compared as to its suitability for dark-room work with a petroleum lamp supplied with a chimney of dark ruby-coloured glass.

The two lamps gave at an equal distance from the sensitometer screen (13½ inches) the same distance as that with which the first experiment with the unprotected Bunsen was made after one minute's exposure, a barely visible image of No. 1 of the sensitometer screen. The red and yellow light were, therefore, equal in non-actinic safety, and it remained to be seen what was the luminous effect that might be made use of in the service of the photographer.

The grease-spot photometer could not properly be employed, owing to the different colours of the two lights, and therefore the direct test of the ability to read type of a certain size at varying distances from the sources of light was brought into requisition. It was found that the printed paper could be read at a distance three times as great from the yellow light as it could from the red, showing nine times as much illuminating power to the eye for the yellow as the red, whilst the safety of the plate against photographic action was the same. It might also be put in another way, that if a certain amount of luminosity was necessary for working by, the operator might, whilst confining himself to that quantity with either light, have nine times less photographic or fogging action upon his plates when working with the yellow light than when using the red.

Spectrum analysis of the two lights showed with the red a range from the extreme red through the orange, and included the yellow; whilst with the yellow, only the sodium line was visible, and the light might be truly called monochromatic, and Gaedicke therefore calls the lamp a monochromatic dark-room lamp, and as such it is now a commercial article in Germany, being made in two forms, one for gas, and another for spirit where gas is not available.

An incombustible wick is placed in the Bunsen flame. This wick is prepared by being moistened, and then dipped into some sodium salt. It is necessary to renew this application daily if the light is constantly used.

For developing, the monochromatic lamp is stated to be superior to the red, in that the intensity of the image can be so much better determined, owing to the visual illumination being nine times greater than with the red lamp, whilst for the dry-plate factory there is the correspondingly greater ease with which defects in the plates can be discerned, or if preferred, the same visual power of light may be employed, and the light will be nine times safer



than when using ruby light. In addition, there is also the greater comfort and freedom from feeling of strain upon eyesight which most at all events feel when working in a yellow light as compared with a red one.

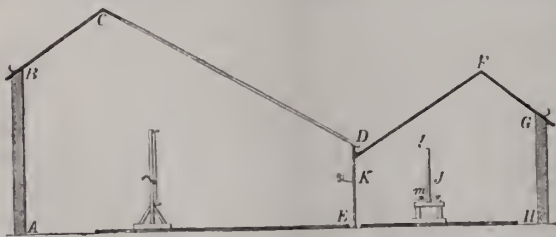
### PHOTOGRAPHY WITHOUT A CAMERA.

For the production of photographs, other than the mere copying of the pattern of flat objects, such as lace, &c., the two first requisites are generally recognised to be a lens and a camera. Photography without a lens has, however, been all along known to be possible, although, until more sensitive substances than those with which photography commenced, were discovered and pressed into its service, the lens was held to be practically a necessity. The later developments of this branch of the art have, nevertheless, shown results superior, at all events in the case of representations of architectural subjects, to those produced in the early days by the lenses and methods then in use.

As we have recently devoted an article to Capt. Colson's experiments and researches in this direction (page 05), we will not now enter further into the matter, but the subject of photography without a camera having a short time since formed the theme of a communication by Professor Max Jaffé to the Photographic Association of Vienna, and possessing practical interest to some of our readers, especially to those who may be engaged in making reproductions of any kind, we bring the matter before them much in the form adopted by the author, whose paper is found in full in the *Photographischer Correspondenz*.

As a preliminary, however, we would observe that the title, "Photography without a Camera," is not strictly correct. By the expression "without a camera," it is intended to convey, as will be understood by photographers, that no distinct, separate box or instrument is required, such as is ordinarily used in connection with the lens. The camera is, in the case before us, really the dark room, and the chamber containing the observer was actually the first camera, as the word itself implies. However, for certain purposes, Jaffé considers that a return to this original system possesses certain advantages over the use of a separate camera into which the plate has to be removed from the laboratory or dark room, and from which it must be returned after exposure, for development. For making enlargements this arrangement is, of course, a common one, but the Professor advocates its application, under some circumstances, for the purpose of making negatives both from the flat and from solid objects.

In the larger number of cases, the studios already in existence are built with a ridge roof, and this arrangement of light is not suitable for working without a special camera, particularly when the object to be reproduced by photography has to be placed within a short distance from the lens. In such a case the light will fall almost exclusively from the top, and although in a few special cases, where roughness or slight protuberances upon a flat surface have to be brought out with abnormal distinctness, such an unusual system of lighting will have its advantages, yet in the majority of instances it would be quite



unsuitable. A special construction of studio is therefore advised—such a form as was not uncommonly recommended for ordinary portraiture some twenty years since, when it

was known as the sloping front light, or tunnel studio. The place of the tunnel is, however, in this case occupied by the chamber, which serves at once as a dark room, and as the camera for the exposure of the plate. The accompanying cut shows the arrangement.

It is particularly necessary to observe the proportions of the various parts, especially of the partition D E, the top of which should be kept as low from the ground as possible, certainly not more than 9 feet high. At D is a gutter to collect and pass off the rain water, both from the studio light, and from the roof of the dark room. The planning and construction of this gutter requires the greatest care, in order to ensure that no moisture penetrate to the partition beneath. On the same account it is necessary in winter to keep the sloping roofs C D and D E, as well as the gutter itself, as free as possible from snow.

Coming to the arrangement of apparatus inside the building, it will be seen that the partition D E serves as the front of the camera. At K the lens is placed, with or without a prolonging cone as the case may require. There is also a movement similar to the rising front of a camera, and it is obvious that the amount of play given by this movement may be made considerably to exceed that which is practicable in the ordinary way.

The easel or movable stand, J, answers to the back part and dark slide of the camera. This easel consists of a table on which is a vertical frame and holder that serves to carry the matt surface opaque plate upon which the focussing is executed, as well as the sensitive plate itself. The frame is fitted, when solid objects are to be photographed, with an arrangement similar to the swing back of a camera. There is a rack and pinion movement connecting the frame with the table by means of which the plate is brought to an exact focus. The carriers of the various sized plates are held in place by buttons at the four corners. The plates themselves and the focussing-screen are kept up to the plane of their work in a similar way, and there are also tongues by means of which the plate or screen may be drawn from its position in the frame. This is a necessity when, as in this case, the frame is not to be tilted like a dark slide for the removal of the plate. There should be a separate focussing-screen for each size of plate that is to be used. It is then seen at once what size the subject will come, and what space it will occupy in a picture of the specified dimensions. The table J runs in grooves corresponding to another pair in the studio, upon which the stand carrying the object to be photographed also moves. These grooves are at right angles to the partition D E, and ensure the parallelism of the whole system.

The first thing to be settled is, that the object to be photographed must not be placed so near the partition D E as to cut off from it any considerable amount of light. The construction of the roof will allow it to be brought to within half the distance that would be permissible with an ordinary ridge roof, and, of course, when the object has to be diminished in the photograph, and a further distance from the screen is available, all anxiety on this score ceases. For copying the same size, a lens is used (Steinheil's wide-angle aplanat, series 6, No. 5) which, when employed in this way, requires the object to be at a distance of about 9 feet, and of course there will be a like distance between the lens and the sensitive plate.

The studio thus recommended for copying purposes is admitted not to be happily constructed if strong side-light effects are wanted, but then it is urged that this is not commonly the case with reproductions. The only serious objection is, that for enlarging from small objects with diffused light, the object might then have to be brought too near the partition for it to be properly lighted. This difficulty can be overcome by the use of a long cone at K. Enlarging by transmitted light can be accomplished in this studio with great facility.

The advantages of photographing reproductions with-



out a special camera, and in a studio of the construction advised, are summed up as follows:—

1st. The difficulty of obtaining an image of precisely correct proportions on the screen, particularly with work requiring exactitude, such as maps, architectural drawings, &c., in question, is great. The head-cloth, a disagreeable incumbrance in hot weather, does not perfectly shut out all that extraneous light which interferes with the distinctness of the image upon the focussing screen. The picture also appears with long focus lenses very dark. Measuring with compasses or rule is difficult, because the points must be applied to the polished side of the glass, whilst the image is on the mat side; and to ensure exactitude the eye must be brought exactly opposite each point in turn without moving the compass in the slightest degree. All these drawbacks disappear when photographing in the dark room serving as camera. One can work as conveniently as a draftsman who traces a drawing upon an easel. The exact measure is easily taken on the dead white surface of the opaque focussing screen, and there is no awkward cloth wrapped round the head. The trial to the sight is also much less than the working with the ordinary camera.

2nd. In copying, the collodion process is generally to be preferred. There is now no delay with the plate, and the liability to drying of the edges, fogging, &c., is much less, as well as to dust spots, caused by opening and closing the dark slide, &c.

3rd. With large cameras, the carriers even when made with the greatest care, become, in time, somewhat warped, so that the plate is no longer truly in the same focal plane as the focussing screen. This evil entirely disappears when the plate is placed in the same holder as the focussing surface.

4th. A large camera, for reproductions is very costly, and when two or more have to be used, a little capital is represented, which may be better expended in a complete series of lenses.

5th. The negatives for the Meissenbach process are best made by crossing the lines on the plate during the exposure, which is interrupted for the purpose. With a camera there is considerable difficulty in ensuring that the plate shall register truly for both halves of the exposure. This difficulty is entirely obviated when operating in the manner recommended.

### THE PHOTOGRAPHIC CONVENTION AT BIRMINGHAM.

THE Convention will be opened on Monday, July 23rd, 1888, by the Mayor of Birmingham, Alderman Maurice Pollack, at a *Conversazione*, to be held in the Masonic Hall, New Street, in connection with an Exhibition of Photographs and Photo-apparatus. The chair will be taken by the Chairman of the Local Committee, W. Jerome Harrison.

The President, J. Traill Taylor, and the President of the Birmingham Photographic Society, Dr. Richard Hill Norris, will also address the meeting.

The rules of the Convention are as follows:—

1. The Association shall be called "The Photographic Convention of the United Kingdom."
2. The object of the Convention shall be the advancement of photography, and of the interests of photographers.
3. The annual subscription shall be 5s.
4. The members of the Convention shall assemble annually in a town to be fixed upon at the previous general meeting.
5. The Convention shall consist of the following bodies:—The council, the general committee, and ordinary members.
6. The general committee shall consist of (a) delegates from societies; (b) members (not exceeding ten) elected by the local committee of the year, and (c) members (not exceeding forty) elected at the general meeting held during the Convention.
7. Every photographic or kindred society in the United Kingdom shall be entitled to appoint one delegate to serve on the general committee. Any society whose members amount to, or

exceed, fifty in number shall be entitled to appoint one delegate for every fifty members on its roll. All delegates must be, or become, members of the Convention, before the opening meeting of that year.

8. Nominations of ordinary members for the general committee must be handed to the Hon. Secretary, and posted by him on the notice board not later than the day previous to the general meeting.

9. The council shall be elected annually from the general committee, by the members of that body, at a meeting held during the Convention, subsequent to the general meeting, and shall consist of twenty general members and five members from the locality where the meeting will be held the following year. The council shall have the sole management of the affairs of the Association, and, except, during the meeting of the Convention, shall meet in London. Five to form a quorum. A meeting of the council shall be held each year in January to receive a report from the local committee, and to confirm the arrangements for the ensuing meeting.

10. The local members of the council elected under Rule 9 shall appoint a local committee to make all arrangements for the meeting of the ensuing year, subject to the approval of the council.

11. The officers shall be elected annually, and consist of treasurer, general secretary, and local secretary. The treasurer and general secretary to be elected by the council. The local secretary shall be appointed by the local committee.

12. A chairman shall be appointed for each evening during the annual meeting.

13. Two auditors shall be elected yearly at the general meeting—who shall not be members of the council—to audit the accounts of the Convention.

14. Alterations of any of the rules can only be made at the general meeting; notice and nature of such alteration must be given in writing at least one clear day previous to the general meeting.

Those requiring further particulars, or desiring the very elaborate programme which has been issued, should communicate with the secretary, J. J. Briginshaw, 128, Southwark Street, London, S.E.

### LAW FOR PHOTOGRAPHERS.

BY S. J. DEBENHAM, SOLICITOR.

#### CHAPTER VI.—BUSINESS TRANSACTION.

##### *Sale of Goods—Statute of Frauds.*

I HAVE in previous chapters referred to the Statute of Frauds, and it appears so important that all persons in business should be acquainted with this Act, that I shall devote considerable attention to the subject, particularly as regards its operation with reference to the sale and purchase of goods.

The Statute of Frauds was passed so long ago as the reign of Charles the Second, and it has been the subject of discussion and litigation ever since. It was supplemented by a further Act on the same subject in the reign of George IV.

The Statute of Frauds 29, Car. 2, i. 3, enacts (s. 17) that no contract for the sale of any goods, wares, or merchandise, for the price of £10 sterling or upwards, shall be allowed to be good, except the buyer shall first accept part of the goods so sold, and actually receive the same; or secondly, shall give something in earnest to bind the bargain or in part of payment; or thirdly, unless some memorandum or note in writing of the bargain be made, and signed by the parties to be charged with such contract, or their agents thereunto lawfully authorised.

In consequence of many disputes having arisen and frequent legal proceedings having been taken under this Statute, the second enactment above referred to was passed, being the 29 Geo. IV., c. 14, c. 7.

It was by this Statute enacted, "That the said enactments shall extend to all contracts for the sale of goods of the value of £10 sterling and upwards, notwithstanding the goods may be intended to be delivered at some future time, or may not, at the time of such contract, be actually made, procured, or provided, or fit or ready for delivery,



or some act may be requisite for the making or completing thereof, or rendering the same fit for delivery.

The Statute applies to all cases where the contract is for a chattel to be afterwards made and delivered for the price of £10 or upwards. The question arises whether this applies to a photograph.

The leading case is an action brought in 1861 (*Lee v. Griffith*) to recover the price of a set of teeth made for a lady. The teeth were made, but, before they could be fitted, the lady died. The dentist sued the executor for the price. This case is important also under another section of the Statute, which I shall presently refer to.

In a previous case (*Clay v. Yates*) it had been decided that a contract for the printing of a book was not within the Statute. Let us see what is the distinction between these cases.

The dentist was to supply the material (the enamel, gold, &c.), and the work and labour to complete the article. The printer was also to supply the material (the paper, &c.), and the work and labour to complete the book.

The Chief Baron (Pollock) said, in the printer's case: "The question is whether this is a contract for sale of goods within the 17th section of the Statute of Frauds, and I am of opinion that it is properly a contract for work, labour, and materials. . . . My impression is, that in the case of a work of art, whether in gold, silver, marble, or plaster, where the application of skill and labour is of the highest description, and the material is of no importance as compared with the labour, the price may be recovered as work labour and materials."

This view was not assented to in the later case.

Justice Crompton, in the dentist's case, said: "The question was, whether the contract could be treated as one for work and labour, or whether it was a contract for goods. The distinction between these two causes of action is sometimes very fine, but when the contract is for a chattel to be made and delivered, it clearly is a contract for the sale of goods. . . . Here, the subject matter of the contract was the supply of goods. The case bears a strong resemblance to that of a tailor supplying a coat, the measurement of the mouth and fitting of the teeth being analogous to the measurement and fitting of a garment."

Justice Blackburn said: "I do not think the test to apply to these cases is whether the value of the work exceeds that of the materials. If the contract be such that when carried out it should result in the sale of a chattel, the party cannot sue for work and labour."

The conclusion I draw from this view of the law is that a photograph of £10 in value is within the Statute.

The contract is good if,

1. The buyer "accept part of the goods, and actually receive the same."

If the vendor, therefore, delivers the goods with an intention of transferring the possession to the buyer, and the latter thereupon accepts, with an intention of taking possession as owner, this will satisfy the Statute. And the acceptance may be either before, or at the time of the delivery, or afterwards.

If the goods are in the custody of a third person, and the vendor gives him an order to deliver them to the vendee, the transaction is complete if the latter agree with the custodian of the property that he shall hold it for him. And where the buyer, though not actually accepting the goods, exercises acts of ownership—*e.g.*, by selling them or part of them (or it)—he is bound. This was held in a case where, having sold part of a stack of hay bought of the plaintiff, the defendant, though wishing to prevent his customer removing it, failed to do so.

There may be a constructive acceptance, though the words of the Statute are "actually receive." It is for the jury to decide whether acts relied upon as proving this, do in fact amount to acceptance. Their verdict, however, may be reversed if the Court on appeal thinks it was not warranted.

The following case will illustrate my meaning. The plaintiff, by direction of defendant, sent timber to him by railway, and a few days afterwards the invoice. The defendant told the railway clerk, on being informed of the arrival of the timber, that he would not take it, but did not return the invoice to the plaintiff for several weeks.

The jury found the timber had been accepted, and on action for the price, found a verdict for the plaintiff; but the judges held there was not sufficient evidence to warrant this.

And even if a purchaser receive goods into a warehouse with the intention of examining their quality only, though he may empty them from one vessel (or several) into another, it is not a necessary inference of acceptance.

Not even the marking of goods with the purchaser's name constitutes an acceptance, unless the goods were actually delivered.

And if a man, having ordered goods, verbally refuses to take them in, though he has them deposited for safe custody, he need not return them, nor give notice that he declines to accept them.

Now for a few instances the other way.

Goods having been forwarded to order and delivered at a carrier's warehouse, the buyer abstained for six months from giving notice that he would not receive them. The jury, having found a verdict against the defendant on the ground that there had been an acceptance, the Court declined to disturb it, holding that there was evidence on which it could be sustained.

The plaintiff, having a flock of sheep for sale, the defendant verbally agreed to purchase some of them; and the plaintiff, by defendant's orders, placed them in defendant's field. The defendant afterwards removed them to his farm, and counted them over, and said they were all right, but the next day wrote to plaintiff saying they were not the sheep he bought, and suggesting an abatement in price. This was declined, and the sheep were returned to the plaintiff; but he was held liable.

The Statute applies to the sale of goods by auction. Goods were knocked down to a bidder at an auction, and handed to him, and after keeping them for a few minutes he refused to take them. By the conditions of sale, the buyer was to pay a deposit at once, and the whole of the price before removing what he bought. The jury found there had been an acceptance, but the Court ruled that there must be a new trial.

Though the purchaser may direct the goods to be sent to him by a particular carrier, and they are sent to him accordingly, or even put on board a ship chartered (hired) by him, this may amount to a delivery to him; but as the Statute says he must "actually receive," he is not liable for the price if he refuse them.

The words of the Statute are "part of the goods" (a portion); the purchaser is liable if he receive the whole.

2. Liability arises if the purchaser "give something in earnest to bind the bargain, or in part payment. The money, or its equivalent, must in general actually pass from one to the other. What is called in some parts of England "striking a bargain," by drawing a shilling across the hand, does not satisfy the Statute.

Where the plaintiff owed the defendant a debt, and sold him goods to the amount of £10, and it was agreed that the debt due from the plaintiff was to be applied in part payment, but no actual payment was made or receipt given, it was held that there was no earnest to bind the bargain within the Statute.

If, however, the agreement had been to sell the goods at a certain price, and it had been afterwards agreed that the amount due from the plaintiff was to be set off against the price, this might have sufficed, and the Statute satisfied without the actual passing of money.

If a cheque be given instead of money, this will be sufficient. Even a bill of exchange, or promissory note, given on account of the price of goods sold under a parol contract, will take the case out of the Statute. In either



of these cases of course an action might be maintained on the document in question, irrespective of the contract, if dishonoured by the buyer, and not paid.

3. The purchaser is also bound, if a memorandum or note in writing of the bargain be made and signed by the parties to be charged with such contract, or their agents thereunto lawfully authorised.

A memorandum or writing, to satisfy the Statute, must contain the names of buyer and seller, or their agents, so as to show upon the face who are the parties to be bound by the contract. It must not be a mere offer or proposal on the part of one of the parties not accepted by the other.

The Statute, however, does not require a formal contract, drawn up with technical accuracy and precision.

Any memorandum under the hand of the party liable, though it does not itself contain all the terms of contract (but it should mention the price), but refers to some other document, and which contains a fuller statement of the terms, will suffice.

Of course, letters will suffice; and even a letter written by a party liable, by which he excused himself from performing the agreement, if written in reply to one from the creditor stating the terms of the bargain, and not contradicting it, will suffice.

The document need not be stamped. The document need not, as above appears, be signed by both parties. Nor need it, in fact, be actually signed at all. The name of the person appearing on any part of the document in his writing, it being obvious what the intention was, is sufficient. Thus, an agreement beginning: "I, John Jones, promise, &c.," if written by John Jones, is sufficient, though a space be left for his signature at the bottom, and this be not filled up. But if the defendant could prove, to the satisfaction of the jury, that he never intended to sign, they might find a verdict in his favour.

It was held by Vice-Chancellor Hall, in *Tonnet v. Cripps*, that a letter containing the defendant's name, printed only and sent by defendant to plaintiff, was sufficient to bind him. This is going further than the previous cases, and the contract was under the 4th section of the Statute.

In *Lee v. Griffin* (previously referred to), the customer for the teeth had written a letter to the dentist as follows:—

"My dear Sir,—I regret, after your kind effort to oblige me, my health will prevent my taking advantage of the early day. I fear I may not be able for some days."—Yours, &c.,

FRANCES P.

This letter was not sufficient to satisfy the Statute. This case has not been always followed in America, where it has been disapproved; but the late Mr. Benjamin, Q.C., who was Attorney-General for the Confederate Government, in his work on "Sales of Personal Property," acknowledged to be the standard work on the subject, dissents from this, and speaks of *Lee v. Griffin* as a "satisfactory settlement of the question." He says the contrary view cannot be supported, even in an extreme case put by Baron Martin, of a portrait painted by an artist for 300 guineas, the canvas of which might cost 10s. "It is obvious that the employer cannot get a title to the picture or any property in it, except through a transfer of the chattel to him by the artist for a price, and this is in law a contract of sale."

The document, if not signed by the party himself, may be signed by his agent lawfully authorised.

Under the 17th section (with which we are now dealing) this authority may be verbal, though the 4th section of the Statute requires that an agent be authorised in writing. The agent may be the agent of both parties—*e.g.*, a broker or auctioneer. But for this purpose one of the parties to the contract cannot be the agent of the other. Though the agent signing has not authority at the time, if this be conferred afterwards, it is sufficient to take the case out of the Statute. Signature by a mark is sufficient. The docu-

ment need not be signed at the time of the transaction; any time will be sufficient, if it be before the remedy is sought to be enforced by the bringing of an action. A letter written afterwards, and signed by the party to be charged (made liable), which refers to the specific contract, will satisfy the Statute. And this may be so, even though the letter be an attempt to get out of payment.

The following letter was held to create liability:—"The only parcel of goods selected for ready money was the chimney glasses, amounting to £38 10s., which goods I have never received, and have long since declined, for reasons given at the time."

The following case has been submitted to me with a request for advice:—

A photographer now residing in Scotland was engaged last year to take negatives by a manufacturing firm in England, and a price was agreed on, it being stated that 62 or 63 would be required. No written contract was signed. The photographer fitted up his dark-room at the factory, and when he had taken twenty-six negatives was told at Christmas that no further work was ready, but he was to wait a week or two. Having waited until February in vain, he threw up the job and took a situation. When his employers found he had gone they wrote demanding the negatives, and now threaten legal proceedings if they are not given up. Money had been paid on account of the work.

It appears to me that the photographer is justified in resisting the demand for the negatives, and not only that, if he has acted reasonably (as to which it is for the jury or judge, *having heard all the facts*, to decide), he would have a remedy for breach of contract. The contract having been made in England is governed by English law.

## BEETLE PHOTOGRAPHY.

BY H. C. HOVEY.

Certain beetles have a peculiar apparatus, enabling them to execute remarkable somersets when laid upon their backs, whence they get their common name of spring beetles or snapping bugs. Their generic name of *Elater*, from the same root as the word *elastic*, is suggested by this power of leaping into the air and alighting again on their feet. This feat is accomplished by having the prosternum elongated into a spine, which fits into a cavity of the mesosternum. The insect, lying on its back, first bends itself upward so that it rests on its head and the tip of its abdomen. It then unbends itself suddenly, the spine enters the hollow described, and thus the back strikes the floor with force enough to throw the creature ten or twenty times its own length into the air. This manoeuvre is repeated until it finds itself on its feet.

Several species of the *Elateridae* are luminous in the dark. The common firefly, or lightning bug, of the United States is too well known to need a special description. But its powers are feeble compared with the so-called "lantern flies," or "cucuyos," found in Cuba, Brazil, and Mexico. M. Michelet records the most extraordinary stories of these natural lamps hung on the trees in the dark southern forests. He says that a Spanish battalion, about to disembark, were deterred from doing so, mistaking the cucuyos for matches which they supposed native soldiers were ready to apply to their arquebuses. He also tells us that persons travelling by night are accustomed to pick these fire beetles from the bushes, and fix them on their boots, so as to show the pathway, and put to flight lurking serpents. In the morning the insects are carefully replaced on other bushes, so as to be at hand for the next lonely tourist that may need their aid. Mexican ladies are said to mount the cucuyos as gems in their hair, string them as living diamonds around their waists, or, imprisoning them in gauze bags, tastefully dispose of them amid their robes, where they blaze or pale according to the condition they may happen to be in.

A living specimen of the *Elater* (or *Pyrophorus*) *noctilucus* was recently presented to the Bridgeport Scientific Society, whose curator, Mr. F. C. Smith, has kindly given myself and others the opportunity to experiment with this interesting representative of the *Coleoptera*. It resembles closely the *E. oculatus*, which is the largest of our common snapping bugs. Its length



is about one inch and a-half, and its prevailing colour is a dark brown. On each side of its thorax are oval spots, looking like eyes, which, however, they are not. In the dark these oval spots throw such a strong greenish light as to seem like a pair of tiny electric lamps in full glow. The cucuyo also emits light from between the segments of the abdomen. Placed on a watch dial, its light enables one to tell the time of night. It is sufficiently strong to illuminate a small printed page so that the words are clearly legible. Its radiance appears to be, to some degree, under control of the will. When a jet of gas is rapidly turned on and off, the insect does his best, whether from rivalry or some other cause.

Being desirous of seeing what might be done in the line of photography by this novel phosphorescence (or whatever this peculiar natural light may be), Mr. Smith suggested to Mr. L. Farini the possibility of taking pictures of small objects by this means. The experiments performed in the presence of the writer and other witnesses were surprisingly successful. Finally, at my request, and especially to illustrate this article, Mr. Farini made the accompanying copy of a family portrait.\* He used a Seed plate, sensitometer No. 24. The *Elatér* was held in the fingers within one inch of the original to be copied, and in such a position as to allow the rays to fall perpendicularly on the negative. The time of exposure to bug light was thirty seconds. The subsequent development was by the usual process. Mr. Farini thinks it possible to photograph the fire beetle by its own light, but has not yet done so. What he has already accomplished, however, is certainly a great novelty in photographic art.

It may be added that, in its Cuban home, the *Elatér* feeds on the sugar cane, and its larva does much mischief by devouring the roots of the various kinds of tropical plants. It seems to thrive in its northern captivity, eats the food provided for it with avidity, and takes kindly to the scientific experiments in which it is called to share.—*Scientific American*.

#### CAMERA CLUB.†

##### DISCUSSION ON THE SUBJECT OF REGULATIONS FOR PHOTOGRAPHIC EXHIBITIONS.

*Mr. A. W. Beer.*

Length of notice.—Three to eight months, according to season.

Previous announcement of judges.—From the first if possible.

Appointment of judges.—The best photographers be asked to judge.

Class : in sizes or subject, or technical and artistic.—Subject decidedly.

Awards or no awards : system of first, second, and third prizes.—One or two awards in class, according to its interest and importance.

Practice of frequent exhibition of medalled pictures in competition.—One special class for medalled pictures.

Limit of number of pictures or wall space.—Depends on space at disposal.

How much of the work to be done by exhibitor.—In the professional or open class no restriction ; in the amateur class, negative and printing.

General remarks.—Avoid the selection of judges with “cranks.” Charge for wall space, say 3s. per square foot.

*Mr. W. J. Byrne.*

Previous announcement of judges.—Most decidedly announce judges.

Appointment of judges.—Artists and artist photographers.

Class : in sizes or subject, or technical and artistic.—Art and scientific sections should be separate. Sub-divisions in subjects and sizes.

Awards or no awards : system of first, second, and third prizes.—Emphatically in favour of awards and degrees in same.

Practice of frequent exhibition of medalled pictures in competition.—Medalled pictures should not be exhibited again.

*Messrs. Green Bros.*

Previous announcement of judges.—To be announced beforehand.

Appointment of judges.—Artists and photographers.

Awards or no awards : system of first, second, and third prizes.—Awards to be given, but not in profusion ; one for best series in each class, irrespective of size.

Practice of frequent exhibition of medalled pictures in compe-

tion.—Allowed to compete again in any other exhibition than the one where medal was gained.

*Mr. P. H. Emmerson.*

Length of notice.—Three months at least.

Previous announcement of judges.—Let there be no judges.

Appointment of judges.—Good technique is good art, and this can only be judged by good artists.

Class in sizes or subject, or technical and artistic.—No classification according to anything except goodness and badness. Bad work to be rigidly excluded.

Awards or no awards : system of first, second, and third prizes.

—No. one, two, and three. Who can decide such refinements?—only artists. No awards at all.

Practice of frequent exhibition of medalled pictures in competition.—Let all pictures be rejected which have not been taken within three years. This would give time for the good pictures to go round the provinces.

Limit of number of pictures or wall space.—Four pictures each in separate frames.

How much of the work to be done by the exhibitor ; All, except printing. Printing to be allowed to make competition with professional photographer fair.

General remarks.—Above all, do away with all distinction between amateur and professional, and no prizes. Charge for wall space, but pay carriage on accepting pictures. Elect hanging committee by plébiscite of all exhibitors.

*Rev. H. B. Hare.*

Length of notice.—As long as possible.

Previous announcement of judges.—Most important to do so, to give confidence to the exhibitor.

Appointment of judges.—Three to five judges in art section, one R.A. and two photographers ; if five, two R.A.'s and three photographers.

Class in sizes or subject or technical and artistic.—According to subject and size, whole plate to be the distinction.

Award or no awards. System of first, second, and third prizes.—Not certain, but inclined to approve of first, second, and third.

Practice of frequent exhibition of medalled picture in competition.—The same picture should be allowed to be exhibited for a period of twelve months, but never admitted for competition afterwards.

Limit of number of pictures or wall-space.—Two in each class ; 16 ft. the limit.

How much of the work to be done by exhibitor.—All, save rolling.

General remarks.—If provincial societies, officers of societies concerned should not compete. Charges 6d per square foot ; 2s. 6d. minimum charge. Hanging committee to be men without interest in exhibition.

*Mr. H. P. Robinson.*

Length of notice.—As early as possible.

Previous announcement of judges.—Before the pictures are sent.

Appointment of judges.—Judging of artistic and technical excellence cannot be separated. The best judge is the one who can see intention as well as accomplishment.

Class in sizes or subject, or technical and artistic.—In classifying, the general effect of the exhibition should take precedence of all other considerations. The pictures should be mixed.

Practice of frequent exhibition of medalled pictures in competition.—Must depend upon the exhibition authorities ; but it ought to be a question of, “Is this the best picture ?” not “Has this picture had enough medals ?”

Limit of number of pictures or wall space.—Difficult to limit. Few exhibitors exceed the bounds of moderation.

How much of the work to be done by exhibitor.—All but mounting and framing. That is, whole of the “making the picture.”

*Mr. R. H. Lord.*

Previous announcement of judges.—Should be announced beforehand.

Appointment of judges.—Prefer artists and photographers jointly.

Class in sizes or subject, or technical and artistic.—Arranged in classes.

Awards or no awards ; system of first, second, and third prizes.—Two medals of different values.

\* We do not reproduce this.—ED. P. N. † Continued from p. 428.



*Mr. S. H. R. Salmon.*

Length of notice.—As long as possible.

Previous announcement of judges.—Not to be announced till after the reception of the pictures.

Appointment of judges.—No picture class artists should judge.

Class, in sizes or subject, technical and artistic.—Should be classed, and picture class judged entirely on its artistic merits by special panel of judges.

Practice of frequent exhibition of medalled pictures in competition.—Works should not be exhibited when a year has elapsed since first exhibited.

How much of the work to be done by exhibitor.—Entirely by exhibitor.

General remarks.—Strongly against appointment of judges year after year; and object to private individuals and firms offering medals for advertising purposes.

*Sir David Salomons.*

Class in sizes or subject, or technical and artistic.—Up to 15 by 12, according to subject, after by size.

Practice of frequent exhibition of medalled pictures in competition.—Only medal once, then disqualify for a reward.

Limit of number of pictures.—Three large, six small.

How much of the work to be done by the exhibitor.—Retouching may be put out. Negative only, unless printing process is a special one. Silver printing only should be put out, none other.

*Mr. F. Macell Smith.*

Practice of frequent exhibition of medalled picture in competitions.—Should limit number of times picture be exhibited.

General remarks.—Has felt very strongly that there should be a special class, in which the whole of work of a picture is *bond-fide* done by the exhibitor.

*Mr. F. M. Sutcliffe.*

Length of notice.—Month or six weeks.

Previous announcement of judges.—Not to be announced previously.

Appointment of judges.—For artistic knowledge only in art section. All artists preferred.

Class: in size or subject, or technical and artistic.—Exhibition should not be divided into classes.

Awards or no awards: system of first, second, and third prizes.—All awards of one value. Approve of awards; poor work would gain prominence if no awards.

Practice of frequent exhibition of same medalled picture in competition.—If same picture, is not to receive more than one medal. Rather tend to the production of a lot of second-class work.

General remarks.—No manufacturer's award to be received.

*Mr. H. Symonds.*

Previous announcement of judges.—Should not be announced beforehand.

Appointment of judges.—Artists and photographers combined.

Class: in sizes or subject, or technical and artistic.—Exhibition should not be divided into classes.

Awards or no awards. System of first, second, and third prizes.—Awards should be given when, in the opinion of judges, examples of work are up to a certain standard.

Practice of frequent exhibition of medalled pictures in competition.—Allow medalled pictures to be exhibited again, or there will be an inferior lot of pictures medalled. There should be fewer exhibitions.

*Mr. H. Tolley.*

Appointment of judges.—The judges should essentially be photographers, who have also artistic knowledge for art section, and scientific photographers for scientific section.

Class in sizes or subject, or technical and artistic.—Artistic and scientific sections; artistic merit main object, not size.

Awards or no awards.—Awards should be given first and second prizes.

Practice of frequent exhibition of medalled picture in competition.—Should allow medalled pictures to be exhibited repeatedly.

General remarks.—No manufacturing or advertising medals.

*Mr. A. J. West.*

Previous announcement of judges.—Do not consider it a matter of importance either way.

Appointment of judges—Artistic section, one half photographers and other half artists. Scientific section: Scientific men only, not artists.

Class: in sizes or subject, or artistic and technical.—Art and scientific photography should be kept separate. Sizes should not be seriously marked out.

Awards or no awards system; first, second, and third prizes.—Most necessary that awards should be given. One award only in each section—the highest.

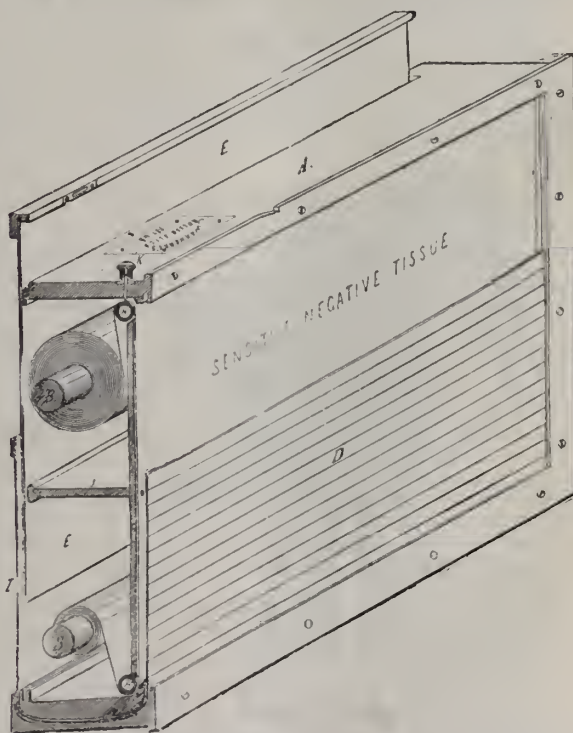
Practice of frequent exhibition of medalled picture in competition.—The present system of sending same picture to several exhibitions I consider a good one.

## CHAPTERS IN ELEMENTARY PHOTOGRAPHY— A GUIDE TO BEGINNERS.

BY W. M. ASHMAN.

### FOURTH ARTICLE.

*The Roller Dark Slide.*—Recent improvements in the manufacture of paper negatives and flexible negative films generally have led to increased attention being devoted to the best or most convenient means of getting a series of negatives upon a continuous band of material, and, as a result fully expected, much ingenuity of design has been shown. So far as the writer has been able to ascertain, the roller slide, like very many other modern appliances, had its origin in an earlier form of apparatus, designed for use with a different process, now defunct. To A. Melhuish is generally assigned the credit of bringing out the first practically commercial roller dark-slide. M. Silvy designed an apparatus for a similar purpose about the same period, and it is open to question whether the latter should not take precedence in originality. Little use, however, was made of these inventions at the time; but some years afterwards Leon Warnerke introduced a modification to suit a



special sensitive collodion tissue he was then manufacturing. Neither of the instruments mentioned, or indeed any of the improved forms, have succeeded in securing sufficient favour to be generally adopted, or, so far as can be ascertained, to diminish appreciably the demand for glass plates in the ordinary dark slide, notwithstanding certain distinct advantages which the roller-slide undoubtedly possesses. These special features are admittedly so important, that we find a goodly proportion of tourist photographers carrying with them one or other



of the latest patented roller-slides as an indispensable portion of their kit ; others have gone so far as to adopt the system of film photography in preference to other methods of negative making, and, of course, to the total exclusion of glass plates.

The principal underlying roller-slides, roll holders, or whatever name they may be known by, is essentially the same as that shown in the foregoing figure ; but the modern improvements furnish a far greater degree of compactness, which combines portability with facility of manipulation. Illustrations of the internal mechanisms of modern roller dark slides appear on page 256 of the *Photographic News*, 1886, and subsequent issues, as well as in the recent year books of photography. The sketch Fig. 11 shows such an instrument attached to a camera in the position it is intended to occupy after the selected view has been focussed and the ground-glass screen removed, or by means of double joint hinges, folded out of the way.

All roller dark slides contain a spool, upon which a length of paper coated with silver bromide *plus* other haloids in gelatine has to be secured. The free end of the paper is usually passed over a registering roller, constructed so as to indicate upon an exterior dial the quantity of paper which has been wound off, and it is fastened by a metal clip, or slot, in a third or receiving roller. Springs, ratchet wheels on the rollers, or some other adjustment provides for tight straining of the paper, so that a surface as plane as that of a glass plate results. The winding operations are effected by means of one or more thumb-screws. Of course it must be perfectly understood that the preliminary arrangements just referred to are made in a so-called dark room, so that there be no possibility of the sensitive paper becoming affected by light of an unsafe character, which we shall more fully understand when we come to treat that branch of the subject. For the present, then, our sketch will convey a clear idea that all is ready for exposure, except drawing the slide

removing the slide and adjusting the focus each time, a variety of subjects can, of course, be photographed, which, presuming all has gone well in manipulation, should yield a corresponding number of good negatives. Film strainers—usually a couple of light rectangular frames hinged at one end, and firmly clasped at the other, and of a size to be inserted in an ordinary dark slide—are sometimes employed instead of rollers for use in making paper negatives, but as each strainer is only capable of securing tightly one piece of sensitive paper of less dimension much than the dark-slide, which contains both frame and paper, they have not, so far, become popular. The method of using a film-holder of this kind is to place a suitably cut piece of paper on film, face downwards, in the open carrier, close lightly, then cover with a flat board, and apply sufficient pressure to fasten all the clamps, which will ensure an even strain from the centre being obtained. The film-holder, now charged with paper, is replaced in an ordinary dark-slide, and used exactly as a glass plate would. There is another form of strainer, namely, two solid backs hinged together. A strip of paper is clipped at the extreme ends, whilst open, and tension is obtained by folding back the leaves and clamping securely. This form of film strainer is available for use with a double dark slide, but it does not appear to enjoy a greater degree of popularity than other claimants of this class for public appreciation.

As we proceed with these chapters we may from time to time find it convenient to adopt the not unusual plan of tracing our course back to subjects partially dealt with in the earlier portions of this series of articles. There are two very important and distinct sections connected with almost every phase of photography it is intended to consider in this course of elementary instruction ; namely, the kind of apparatus employed, and the various manipulatory details of each particular process. The latter will probably appear more clear to a novice, after the remarks concerning selection and other descriptive details of apparatus have been studied ; for this reason, a full account of the method of making paper and film negatives will be deferred until the first part of our programme—the consideration of apparatus—has reached a more advanced stage.

### Notes.

According to a weekly paper, a Photographers' Union has been organised in New York, its objects being to establish a minimum wage for retouchers, printers, and apprentices, to drive amateurs out of the business, and to found a labour bureau. The first and third of these objects are praiseworthy and practical, but we fail to see how the amateur is to be driven out of the business. Allowing that there are photographers who, calling themselves amateurs, are not above being paid whenever they get the chance, how are they to be prevented from so doing ? Is it proposed to boycott the dealers who supply them with goods ?

The French Photographic Society, at its June meeting, took possession of its new premises. M. Davanne occupied the chair, and in spite of the increased accommodation, the room was crowded. It was announced that the social reunions would be recommenced on the third Wednesday in each month. M. Davanne also alluded to the laboratory which was at the disposal of the members. The leading French Society is certainly ahead in many respects of the Society which in England is supposed to occupy a similar position.

The amount of money spent by the Royal Geographical

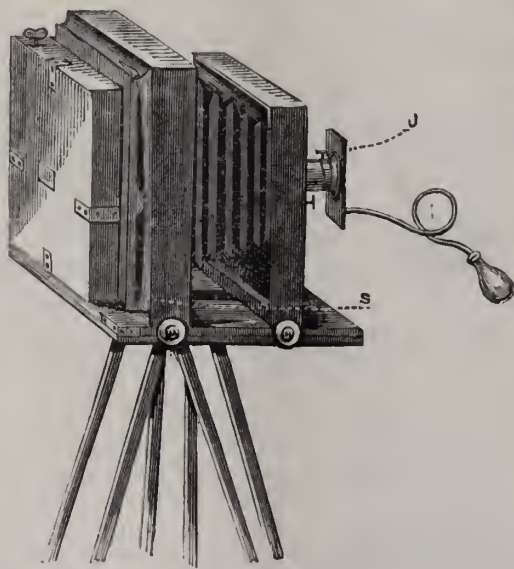


Fig. 11.

shutter (S) and uncovering the lens (L). An exposure made, the sliding shutter is pushed home as in Fig. 11, and if a duplicate be required, the exposed portion is wound upon the receiving roll, and another length of unexposed paper will, as a consequence, take its place. This can be done without removing the instrument from its place in the camera, the shutter is again withdrawn, and a second exposure made. In this way twenty-four, or more, duplicates may be obtained on one band of paper ; or, by



Society over its Journal must be very trifling compared with the lavish expenditure of the Microscopical Society in the same direction. The one is as attenuated as the other is portly; and while the Geographical Society is content with giving its members a few maps, the Microscopical Society is liberal in the supply of elaborate illustrations, executed at a considerable cost. The former Society missed an opportunity of advancing with the times in the last issue of its Journal. It published a most interesting paper by C. M. Woodward on the Solomon Islands—almost a *terra incognita*. Mr. Woodward, indeed, is the first Englishman who has penetrated to certain portions of the Islands, and having a camera with him was able to bring away what the President said were admirable photographs. Why could not some of these photographs have been reproduced and published in the Journal with the paper? The Geographical Society is essentially a popular Society—that is to say, the sole qualifications of a large number of the members is their subscription, and we should fancy that to anything which made their Journal interesting they would not object. Anyway, the contrast between the “organs” of these two large and wealthy Societies is very marked.

Those ardent amateur photographers who are on the look-out for stray flashes of lightning in obedience to the request of the Royal Meteorological Society, should be careful where they place their cameras. A gentleman in the suburbs left his camera for an hour in his garden one night in expectation of securing a prize, and to his disgust, when he returned, discovered that someone had been beforehand with him, and had walked off with the entire apparatus. He is inclined to think that the perpetrator was not acting in the interests of science, for some silver forks and spoons, carelessly left by the servant on the sill of the kitchen window, which was partly open, disappeared at the same time.

A story of photographic ingenuity has reached us. A householder, troubled to an exceptional degree by swarms of the insectivorous pests which specially infest old underground kitchens, after having tried every kind of insecticide and vermin destroyer in the market, went with his grievance to his landlord, who had, it seemed, verbally assured him that the basement of his tenement was virtually free from the pests in question. But finding his repeated complaints ignored, the tenant thought him, being a photographer, that a “dry plate” might do what plates of sour beer and basons of turpentine and cucumber rind, and the like, had failed to accomplish. So one night, having arranged his camera in the kitchen beforehand, he descended at an hour when he knew the usual nightly “black-beetles’ ball and cockroaches’ feast” would be at its height, and suddenly igniting, by means of an electric current, several piles of magnesium-flash composition which he had arrayed, he adroitly secured a negative of that part of the floor where the pests were thickest; their “thickest” being so thick, indeed, that his photograph looked, when developed, more like a corner of a block tessellated pavement than of a kitchen floor in

a south-western suburb of London. Having made a print, he mounted it and sent it by post to his landlord, with this covering note:—“Dear Sir,—Having become of necessity a practical entomologist since I rented my present house, I have lately joined the local Entomological Society, and at the next quarterly meeting I intend reading a paper on ‘The Fecundity of the Common or Kitchen Black-beetle,’ illustrated with dissolving views. I enclose you one of a series of the illustrations which I am preparing, and may inform you that this, like the whole series, has been taken in my own kitchen; and it may further interest you to know that I have arranged for the appearance of my paper with the illustrations, and of course full details as to the kitchen where they have been taken, in the local journal, which, as you are aware, circulates enormously in this district, in which, I believe, your stake, as a house owner, is considerable. Feeling sure you will appreciate the gratuitous advertisement I shall thus give to the beetle-producing properties of your tenant’s kitchen, I beg to remain, yours truly, A. P.—P.S. I shall, of course, as a Corresponding Member of my Society, be not ready to answer any enquiries I may receive as to the peculiar fecundity of the beetles bred in your houses.”

Now, strange to say, instead of getting any written reply of effusive thanks to this genial note, its writer was the very next day waited on by a master-mason, who said he had been sent by the landlord “respecting those black-beetles of yours;” and who added that he had been commissioned to carry out forthwith a novel plan for the extirpation of such pests (at the landlord’s sole expense) which he (the master-mason) had never known fail. It is, perhaps, scarcely necessary for us to add that the tenant’s paper on “The Fecundity of the Common or Kitchen Black Beetle” was not read at the next meeting of the Tooting Entomological Society. The local directory, in fact, does not contain any record of the existence of such a society at all. But, of course, directories, like gas-meters, cannot be considered quite infallible; so we will not make too much of the omission in question.

It is curious to note at the last meeting of the Royal Astronomical Society, that in spite of the encomiums as to the immeasurable superiority of photography over drawings, as shown by the recent photographs of the Pleiades, by the Brothers Henry, one member could not be brought to think that photography would be of any use in the case of the moon. Mr. Marth appears to have taken the moon under his especial protection, and up to the present time has not been satisfied with the sketches which have been made. He says: “If we could only get sketches of the nearly full moon, as seen with the naked eye, or with the assistance of a small opera-glass, and then compare them with the sketches made with the help of telescopes, we should have a far better chance of judging by analogy what the sketches of Mars really teach.” It may be so, but surely it is a very round-about process, and one subject to all kinds of errors, for no two persons see the same thing alike. Mr. Knobel, who is a draughtsman of



some skill, said as much, but refused to accept the suggestion of Mr. Common, that photography would answer because photography was not "delineation." Mr. Green, however, pointed the moral of the discussion by remarking that he was engaged on some drawings of the moon when Warren de la Rue's photographs were exhibited, and on seeing the latter was so convinced that no drawings could ever compare with them, that he gave up the task. It is difficult to understand why, if photography is satisfactory in the case of the nebulae, it should not be still more so in the case of the moon.

## Patent Intelligence.

### Applications for Letters Patent.

9,711. WILLIAM TYLAR, 12, Cherry Street, Birmingham, for "Improvements in apparatus for producing and discharging currents, for washing photographic plates and prints, or other analogous purposes, capable of being attached for use upon or to any ordinary vessel."—July 4th, 1888.

Patent which has become Void through Non-payment of Duty.

5,353 of 1884. H. KAYSER.—Photographic exchange boxes.  
5,647 of 1884. J. THOMSON.—Photographic camera stands.

### PORTABLE MAGIC LANTERN.

BY T. O'CONNOR SLOANE, PH.D.\*

A VERY compact form of magic lantern is illustrated in the cuts accompanying this article. It is adapted for all experimental purposes, as well as for the projection of views. The best way to give a correct idea will be to take, as example, a  $4\frac{1}{2}$ -inch condenser lantern, and give the dimensions of the different parts, as shown in the cut. The size of the condensers settles the question of the measurements of the other parts.

The two condenser lenses, plano-convex, are mounted each in a separate board. A circle is turned out with a rabbet in each board, in which the condenser seats itself, and is secured therein by three buttons. The rear condenser board, A, is  $6\frac{3}{4}$  inches square. The front board, B, is of the same width, but  $3\frac{1}{4}$  inches long. To the rear one a strip is screwed across the top edge, and the front one is hinged to this strip. At their bases, coming between them, two small abutting strips are secured. The thickness of the strips is such that the boards, when brought together, with the strips in contact, are strictly parallel, and the lenses are held apart from each other.

The frame or base of the lantern is a three-sided square, a little over  $6\frac{3}{4}$  inches across, and 13 inches long in internal measurement. It is closed at the front, and open at the back of the lantern. It is  $2\frac{1}{2}$  inches deep;  $7\frac{1}{2}$  inches from its front, the back condenser board is hinged to a strip that runs across the top of the frame, and is screwed firmly thereto, flush with its upper surface. A long brass hook, f, and staple is provided, for holding the condensers in place when vertical. The boards are held together, when desired, by another shorter hook, c, with staple. The condensers are then in place for horizontal projection. To arrange them for vertical projection, the small hook, c, is unfastened, the front condenser, B, is pushed up until the two are at an angle of  $90^\circ$ , and a plane mirror is inserted, resting against the two bottom strips. The mirror should be mounted on a thin board or on a brass plate, so as to provide strength and protect its back.

A mortise is cut in the front condenser  $6\frac{3}{4}$  inches from its top,  $\frac{5}{8}$  inch wide, and  $3\frac{1}{2}$  inches long. A piece of board, a, is cut to slide smoothly back and forward through this mortise. For retaining the strip in any desired place, a hand screw, e, is placed on the side of the condenser board, which is notched at both its lower corners. A strip of brass is attached to the side of this strip for the screw to press against.

The strip carries the slide carrier, b, and lens, C. The lens is attached to a board about 4 inches wide and  $5\frac{1}{2}$  high, with a tenon projecting from its base. A mortise is cut near the end of the sliding strip to receive this tenon.

A second mortise or slot,  $4\frac{1}{2}$  inches long and 2 inches wide, is

made in the strip, a. The slide carrier, b, is a board  $6\frac{1}{2}$  inches high by  $4\frac{1}{2}$  inches wide. To its base is attached a piece of wood 3 inches square. This is  $\frac{1}{2}$  inch thick, and below it is a second piece of the same length, but just 2 inches wide. The second piece enters the slot in the sliding strip, a, and the slide carrier rests upon the shoulders formed by the upper block. A hand-screw, d, is arranged to hold the slide-carrier in place where desired.

A smaller movable mirror, D, is supported above the objective when the lantern is to be used for vertical projection.

A piece of sheet iron is fastened across the bottom of the main frame, on which the lantern, E, rests. In the front of the same frame a notch is cut in which the piece, a, rests. To make its position in the front condenser board more secure, a second strip may be attached just below the mortise and to the back of the board.

For lantern any good form of screened lamp may be used. If necessary, a sheet iron box may be arranged to inclose the source of light. But with such a lantern as is here shown it is quite unnecessary.

In the drawings, fig. 1 shows the whole ready for mounting,

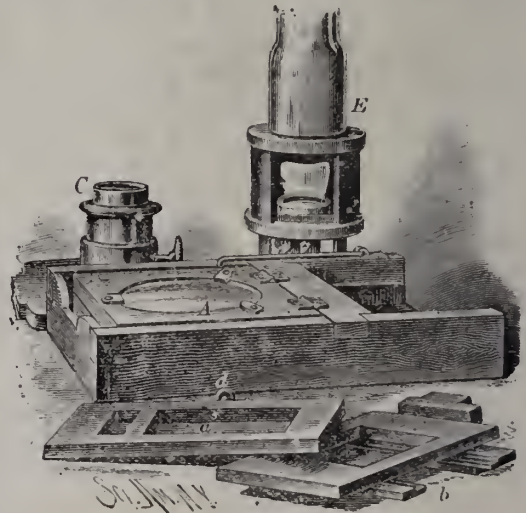


Fig. 1.—Portable Lantern Taken Apart.

the lamp being lighted and ready for work. The lamp should always be lighted before beginning, as it may take five minutes for it to attain its full power. Fig. 2 shows the whole put to-

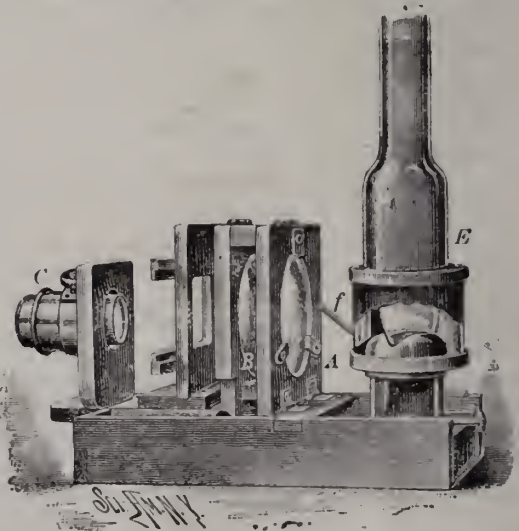


Fig. 2.—Lantern Arranged for Horizontal Projection.

gether and arranged for exhibiting views. By removing the slide-carrier the entire space between condenser and objective



is free for the introduction of apparatus or performance of experiments. A soap bubble can be blown and projected in this space. A glass of water can be very prettily shown, and the lantern will be found admirably adapted for the experimenter's use. Fig. 3 shows the lantern arranged for vertical projection,

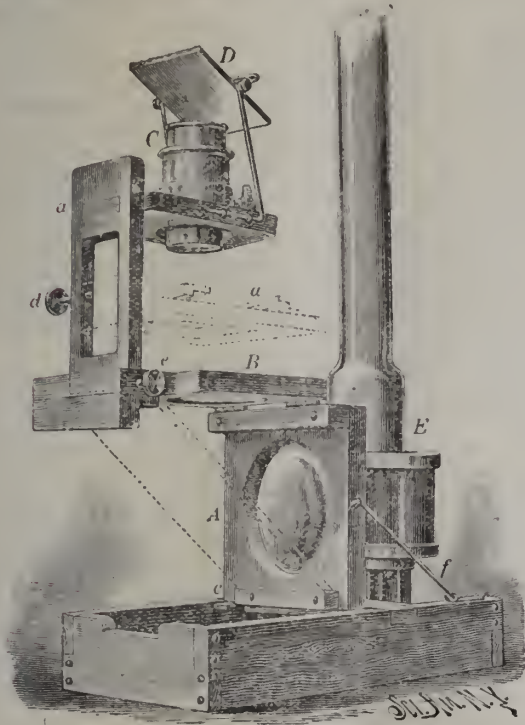


Fig 3.—Lantern Arranged for Vertical Projection.

the outline of the mirror being given in dotted lines. As the slide-carrier is not always used for work in this position, it, too, is shown in dotted lines.

If all is properly constructed, the apparatus will be susceptible of all kinds of adjustments. The sliding board, *a*, can be moved back and forth in the mortise in the front condenser board. The slide carrier can also be moved backward and forward. By these two adjustments the slide-carrier can be brought to any point desired in the cone of rays converging from the condensers. By moving the lantern backward and forward, any modification in the direction of the light rays emerging from the condenser can be given.

A lime light can be used instead of an oil lamp. But as the object was to show a portable lantern, the former has been shown in the cuts.—*Scientific American*.

## Correspondence.

### THE PARIS EXHIBITION.

SIR,—I am anxious to bring specially under the notice of photographers and makers of photographic apparatus, the arrangements which are being made in this country for the British section of next year's Paris Exhibition.

The committee of the section has been remarkably successful in obtaining the support of our principal manufacturers, and the industrial and machinery courts will be very well filled; but in the important department of photography, and indeed as regards scientific apparatus generally, we have been less successful. Though some of our most important makers will exhibit, the exhibitors will be much less numerous than in the Paris Exhibition of 1878. This is the more remarkable, as on that occasion English photographers were extremely successful, obtaining no less than thirty-five medals or diplomas; a larger

number than was taken by the exhibitors of any other country except France and Austria-Hungary. These awards included four gold and seven silver medals.

It would be a matter for regret if we were to allow our competitors on the Continent to believe that this country, which took so decided a lead in the early days of photography, has now fallen to the rear, and this impression will certainly prevail unless we are able to make a better show both of photographic apparatus and photographs than we appear likely to do.

As regards photo-mechanical processes, we are admittedly inferior to the French, and those who work processes in this country have not even the courage to enter the arena with their rivals; but I have yet to learn that this is also true either of apparatus or photographs themselves.

Paris next year will be visited by crowds of people from every part of the world; and, from a merely commercial point of view, it will be a loss to the makers and sellers of English apparatus if foreign manufacturers are to be allowed to have it entirely their own way.

It has been objected that in the case of the Paris Exhibition—or rather, in the British section—charges are made for the space occupied; but these charges will only cover the bare expenses of the section, and it merely means that exhibitors have to do for themselves in this instance what Government has done for them in previous cases. Englishmen are pretty well used to getting on without Government aid in most matters, and there seems no reason why they should not do so in an International Exhibition as well as elsewhere.

Prospectuses and full information can be obtained at the offices of the British section, 2, Walbrook, E.C.

Though the allotment of space is now proceeding rapidly, and the space is, indeed, pretty nearly all occupied, there will be no difficulty in accommodating such things as photographic or scientific apparatus, which, of course, do not require a large amount of space for their exhibition.—I am, sir, yours faithfully,

H. T. WOOD,

Secretary to the British Section of the Paris Exhibition, 1889. 2, Walbrook, E.C., July 9th, 1888.

### THE PHOTOGRAPHIC CONVENTION.

SIR,—Kindly allow me, through your columns, to announce that the forthcoming Photographic Convention will be held at the Masonic Hall, New Street, Birmingham, on the 23rd inst., and will be opened by the Mayor of Birmingham, Alderman Maurice Pollock, at a conversazione in the evening of that day.

Special advantageous arrangements have been made for members travelling from London. Full particulars, with details of excursions and local arrangements, will be forwarded on application. J. J. BRIGNSHAW, Hon. Sec.

128, Southwark Street, London, S.E., July 10th, 1888.

### PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

SIR,—Will you allow me to call the attention of those gentlemen who propose becoming members of the Convention to the necessity of advising me at an early date which excursions they intend joining, as it is necessary to have some idea of the number to be provided for, in order to make arrangements with the Railway Companies (who will attach saloons if a sufficient number of passengers be expected) and the different hotels.

If a post-card be sent me stating how many tickets will probably be required for each excursion, it will facilitate matters; at the same time the order will not be considered binding if anything should happen to prevent attendance.

Tickets must be obtained the evening before each excursion to ensure proper accommodation, and applications should state if refreshment will be required, or not, and if brake will be used.



The excursions arranged are:—

	July 24.	Fare.	Lunch or Tea.	Brake.
Bewdley, Arley, Highley ...	...	3/4	2/6	—
Stratford, Wixford or Salford ...	...	2/10	2/-	4/-
Oxford ...	...	7/- or 5/-	2/6	—
July 25.				
Coventry, Kenilworth, Stoneleigh ...	...	2/-	2/-	5/-
Warwick ...	...	2/6	2/-	—
Worcester, Malvern ...	...	4/-	2/6	—
July 26.				
Lichfield and Sutton... or, Lichfield and Aston ...	...	1/9	2/6	—
Stratford, Charlcote... or do. by brake ...	...	2/10	2/-	5/-
...	...	1/11	1/6	—
July 27.				
Dudley, Castle, Priory, and Wren's Nest ...	...	1/-	2/6	—
Shrewsbury ...	...	4/5	2/9	3/-
Worcester, Tewkesbury ...	...	4/-	2/6	Boat 2/6

Some of the fares are subject to reduction. Moderate walkers need not incur expense of brake.—I am, sir, your obedient servant,

F. J. C. TAYLOR, Hon. Sec. Excursion Committee,  
16, Imperial Chambers B, Birmingham, July 9th, 1888.

#### PHOTOGRAPHY WITHOUT A LENS.

DEAR SIR,—I have just read an editorial article in the number of your excellent journal for May 18, 1888, on "Photography Without a Lens." Reference is made therein to the work of Captain Colson, of the French Army Engineers, in this direction, coupled with the remark that "perhaps the publication by Captain Colson of the conclusions derived from his labours will induce photographers in countries other than his own to devote some attention to the subject."

In view of this, I desire to state that much attention has been given to that subject by me (though I am only an amateur photographer), both in California and in this city, since October, 1884, when I first hit upon the true principles involved, and obtained some excellent results. I also take the liberty to enclose to you herewith two articles on the same subject written by me for the *St. Louis Photographer*, and published in that journal, one in November, 1886, the other in January, 1887, as well as a copy of a United States patent (application filed July 9, 1886, and granted to me Feb. 15, 1887) for a "Diffraction Camera" embodying the newly-discovered essentials to success.

In the specification to these letters patent, and in the papers above referred to under the headings "Diffraction Photography," and "Diffraction and its Relation to the Formation of Photographic Images through a Minute Aperture," I stated the chief results of my experiments up to that period, with deductions and theoretical reflections based on them, and gave a "Rule for finding the time of exposure of an instantaneous film, in good daylight, at any given distance from any given aperture."

Since that time, greater sensitiveness having been given to their plates by dry-plate manufacturers, I have had occasion, from further experimental data obtained by using them, to change the empirical basis of that rule, and to found it on something much more exact.

On the 5th of last May I succeeded in making a negative picture of a landscape, illuminated by a clear sun, in this latitude, at 8 a.m., on a very sensitive gelatino-bromide dry plate (Seed's, sensitometer No. 23), placed at a distance of .312 of an inch from one of my diffractors .010 of an inch in diameter, in .032 of a second, by means of a drop-shutter, the time having been accurately measured. This was almost exactly the limit of time necessary for this diffractor, distance, and light: for those objects on which the sun directly shone developed well, whilst those in the

shade of trees were barely visible. The diameter of a circular picture that can be well impressed under the conditions mentioned is rather more than one inch.

Using the result of this experiment, confirmed by others made at other distances and times, and with square diffractors of other diameters, for basic data, I have been enabled to construct a table of times of exposure, for reference, with diffractors from .001 to .016 of an inch in diameter (the latter being the largest size I ever use), at a uniform distance of one inch from the most sensitive films now made, and exposed in good daylight.

By the rule previously formulated the time of exposure for any other distance can be accurately calculated, and approximately so for other plates of different sensitometer numbers, and exposed to varying intensities of light.

This leads me to observe that the supposed "law" laid down by Capt. Colson, as stated, "that there is with each distance of aperture from plate a certain size of opening with which the maximum sharpness obtainable without a lens is produced," is, I think, entirely erroneous, and without foundation in fact.

The only thing that controls the sharpness of the image is the diameter (and kind of edges, of course) of the diffractor, and the same diameter is equally effective at one distance as at another for this purpose, provided the illumination of the object and the sensitiveness of the film are sufficient. The smaller the aperture, the sharper the image at any distance, with the proviso just mentioned. It matters not whether the image be visible on a screen or not, if the film used be actinically sensitive enough (and there is no glass here to absorb the ultra-violet rays), the impression will be produced and can be developed. I have perfect negatives which I made more than three years ago by diffractors .002 of an inch in diameter, and the minuteness of such an aperture must be seen to be realized, far smaller than the cross-section of the finest hair.

That diffractor which gives better results, in sharpness of picture, than another of similar construction, but larger diameter, at one inch from plate, will also give better results, with suitable plate and light, at  $\frac{1}{2}$ -inch, or 2, or 5, or 6, or 8 inches. If the quantity of actinic radiations admitted to the film be enough to impress it, then the fineness of the lines of the image will depend solely on and be in direct proportion to the minuteness of the aperture through which the radiations are admitted, whether this aperture be near or far. That I hold to be the law for sharpness.

Having eliminated, to a great degree, by actual experiment, the two objections heretofore made against photography without the use of lenses—viz., want of sharpness in the picture, and considerable time of exposure required—it seems to me the photographic lens-makers may have, ere long, to look to their well-earned laurels.

I have negatives taken by the diffraction method, in one second, with well-defined lines of fence, pickets, &c., measuring under the microscope only .002 of an inch wide, which is as narrow as any I have found in a landscape negative taken with a lens; but this cannot be done with any apertures used or recommended by British or Continental writers up to this time, so far as I know. To obtain fine outlines a diffractor, with good edges, not exceeding one-fifth of a millimeter, must be employed.

I shall merely add, in conclusion, that as I have not taken out any English or other foreign patent, my invention is free in European countries. But one naturally likes to get such credit as may be due. Perhaps extracts from, or the whole of the printed slips enclosed on "Diffraction Photography," might prove interesting to your readers.—Very respectfully, &c., JNO. VANSANT, M.D.

U.S. Marine Hospital, St. Louis, Mo., U.S.A., June 9th.

In one of the papers referred to our correspondent says:—

If a glass plate, whose surface for a small space, say  $\frac{1}{4}$ -inch



square, has been ruled with fine parallel lines about  $\frac{1}{1000}$  of an inch apart, forming a "grating," be held between the eye of an observer and a narrow line of light (like the edge of a flat gas flame, or a crack between the neatly closed solid shutter of a

window), distant 12 or 15 feet, so that the lines on the glass and the luminous line are in parallel planes, he will see the luminous line somewhat dimmed, and a little removed from it on either side, separated by dark spaces, several bright coloured spectra



Diffraction Photograph (no lens used), by Dr. Jno. Vansant. View from front of Marne Hospital, St. Louis, Mo.—August, 1886.



(violet, green, and red), which are broadened images of the light line. If the crack in the shutter happened to be crossed by some opaque body, as a strip of black paper fixed at right angles to it,

this body will be clearly seen across all the spectra, and also apparently sometimes over the intervening dark spaces.

These spectra are known as diffraction spectra, and they are



caused by the interference of the waves of the luminiferous ether after their passage between the narrow lines of the grating.

When ether waves collide with an opaque solid, they are inflected at its edges, bent behind it, and interfere with each other. If the interference be in a certain way, they may extinguish each other wholly, or partially; in another way, and the brightness may be increased; in another way, and certain of the waves of a particular length only may be extinguished, leaving the remainder as coloured waves. And these coloured waves may be so combined with the places of the extinguished waves as to form alternate dark spaces and coloured images, of an object, on either side of the place where the deflection from collision occurred; the degree of separation of the images depending on the angle at which the waves collided.

If, instead of a grating, a single narrow slit, about  $\frac{1}{1000}$  of an inch wide, cut in a piece of metal foil, be employed as just described, there will appear, on either side of the greatly dimmed



Diffraction Photograph. Negative in 1 second. (No lens).

luminous line, a series of diffraction spectra and dark spaces like those above described, but the latter not well-marked, the colours usually fading into each other in regular succession; and here, too, a narrow dark body, fixed at right angles across the line of light, will be seen elongated and crossing all the spectra very distinctly.

If, conversely, instead of a luminous line on a dark background, a narrow opaque object on a wide light background, as a vertical



Diffraction Photograph (no lens), by Dr. Jno. Vansant. April, 1888. Diffraction,  $\cdot 008$  inch, at 2 inches distance.

bar of a window sash, several yards distant, be viewed through the single slit held parallel to it, it can scarcely be seen; whilst a similar object or bar at right angles to the direction of the slit will appear sharp, clear, and uncoloured.

It is therefore evident that if two narrow slits in separate pieces of metal foil be crossed, and vertical and horizontal opaque bars on a light ground be viewed through the resulting square aper-

ture, both sets of bars will be distinctly and equally visible at the same time.

In this case the defraction of light, right and left, at the first slit (supposing it to be the vertical one) is not lessened by the reduction of the length of the slit, for it is the width that determines the degree of the diffraction, and the same may be said in regard to the second or horizontal slit, and the up and down diffraction from it. Hence, the diffraction was the same in extent after as before the slits were superimposed at right angles.

Why, then, is it that the horizontal and vertical components of an opaque upright object (like a window sash, or a picket gate), on a bright background, are visible at the same time through a certain square aperture, whilst only one of these components is visible at a time through a slit of the same width as the square?

The reason is simply that, in the case of the square aperture, the quantity of light from the object, capable of passing through the square, is so reduced that these ether waves are no longer able to produce secondary images bright enough to be visible; so the whole object appears dark on a light ground. When the slit is used, the number of ether waves passing through it, in the direction of its length, is sufficient to bring about that kind of interference or commingling that produces white light; and as diffraction or inflection of ether waves occurs along the sides of all the opaque bars of the sash, those overlapping waves proceeding from the bars parallel to the slit enter the latter, and produce by interference the same effect as if they had radiated from a bright bar; whilst the similar waves from bars perpendicular to the slit enter it in such manner, on account of its narrowness, as by their interference to extinguish each other, and these bars, consequently, appear dark.

That something of this kind actually occurs, seems to be proved by the following experiment. I made a photographic negative of a view, including buildings, trees, a waggon and men, by means of a square aperture  $\frac{2}{1000}$  of an inch in diameter, placed three inches from the sensitive plate.

Examination of this negative picture showed that all objects impressed had plain double outlines, and these were in every direction. The flagstaff was double; the trees and the head and arms of the men had double outlines; the sash of windows, the tongue of the waggon, and, notably, all the spokes of the wheels, were double.

This can only be explained by that undulatory theory of light which accounts for the curious phenomena of diffraction. When the size of the aperture employed for taking the same view was reduced to  $\frac{1}{1000}$  of an inch in diameter, the double lines all disappeared, and the outlines of objects were single and sharp; but when the size of the aperture was increased beyond that first used, the outlines of everything became more blurred and indistinct, and the well-marked double lines also vanished.

The good quality of photographic pictures, then, taken by means of a minute aperture in an opaque diaphragm, is evidently due to the control which such an aperture exercises over the quantity of light (i.e., the diameter of the conical beam from every point of an object) admitted to the sensitive film, and the character of the interference of the diffracted ether waves which is then possible.—From the *St. Louis Photographer* for January 1887.

## Proceedings of Societies.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The usual weekly meeting was held on the 5th inst., W. COBB in the chair.

L. MEDLAND exhibited a hand camera. It was of the Scovill type, and very portable.

A. S. NEWMAN, the inventor, explained the working of the camera. It was fitted with a rectilinear lens of short focus. All the working arrangements were at the bottom of the camera. The plates, twelve in number, in the carriers, were placed at the back of the camera, and held in position by a string at the back. Fixed to the top of the receptacle holding the plates is a bag, by means of which the front plate after exposure can be drawn out, and placed behind the others. The shutter worked at a speed of from  $\frac{1}{4}$  to  $\frac{1}{1000}$  part of a second. This, the inventor stated, had been determined by a method, not a photographic one, by which the speed of any shutter could be calculated as easily as measuring the  $\frac{1}{1000}$ th of an inch with a foot rule. He was not prepared to state the method, as it was a trade secret.



The CHAIRMAN had used a camera on a similar principle, and had found it answer very well.

A. HADDON passed round a lens. The lens tube was brass, but the front diaphragm and the flange was of ebonite, which lessened the weight very considerably.

A question from the box was read—"When sensitizing albumenized paper, is it better to allow the nitrate to dry spontaneously, or to remove the excess by blotting-paper?"

J. J. BRIGINSIAW would prefer to use blotting-paper.

A. HADDON said the use of blotting-paper prevented unequal absorption. Superfluous nitrate, if allowed to soak into the paper, would cause unequal depth of printing. Removing the paper slowly from the bath would obviate the necessity for the use of blotting-paper.

The CHAIRMAN said it was quite possible to take a sheet of paper off the bath without a single drop of solution accumulating.

A MEMBER said, suspending a sheet of paper vertically to dry, which was frequently done, had a tendency to cause the top part of the sheet to become stretched.

Question from the box—"When printing in clouds, is it better to do it before or after the view is printed?"

H. D. ATKINSON was in favour of printing in the clouds after the view, although he admitted that this sometimes depended upon the subject and circumstances.

Question from the box—"Can anyone give information how to select the best writing diamonds, and the relative merits of writing diamonds of different qualities?"

W. H. HARRISON believed that writing diamonds were split, and that glazier's diamonds were cut. Some discussion on the subject followed, but no definite information was elicited.

Question from the box—"What is the best method of obtaining chlorophyll?"

A. HADDON said it could be readily obtained from parsley by macerating in a mortar, then covered with ether, filtered, and evaporated to dryness. Absolute alcohol is then added, and again filtered and evaporated. If kept in solution it was desirable to add some zinc filings to prevent loss of colour. It would keep longer in a dry state.

#### NORTH LONDON PHOTOGRAPHIC SOCIETY.

A TECHNICAL meeting was held at Myddelton Hall, on Tuesday, July 3, J. TRAILL TAYLOR in the chair.

W. T. COVENTON exhibited prints from negatives taken at Wildwood, near Enfield, and recommended the locality as a suitable one for photographic purposes.

Mr. COSSOR showed views of Old London, including St. John's Gate and Cloth Fair. The latter being a very narrow and badly lighted thoroughfare, he asked the best conditions under which to obtain an evenly lighted picture.

The PRESIDENT said that it would be useless to attempt such a subject in sunlight; the street might be compared to a ravine, and would be more evenly lighted on a dull day.

W. BISHOP passed round a sample of hydroquinone he had been using; he had found that it took half an hour to obtain the same amount of development that he got with pyro in five minutes.

L. MEDLAND showed a novel and convenient detective camera which had been constructed for him by A. S. Newman. It was covered with brown paper encircled with an ordinary rug strap, and was of smaller size than the usual form; no dark slides were used, twelve plates being carried in sheaths in a small changing box fitted with an ordinary sliding shutter, so that it could be removed from the camera and a focussing screen substituted. The focussing, and setting, and regulating of the shutter were performed by levers fixed under the box, audible clicks telling the operator when the various operations were performed, and also indicating the rapidity to which the shutter was set. The instantaneous shutter was of a new pattern, and worked between the combinations of the lens, giving an exposure of the  $\frac{1}{150}$  of a second. In answer to a question, Mr. Newman said that he intended to introduce the changing-boxes commercially in all sizes; he thought they would cost about double the price of a first-rate double dark slide. The smaller sizes carried twelve plates, while he found eight plates enough for the whole-plate sizes or larger.

Mr. BISHOP said that he had made a somewhat similar changing box; he had, however, made the sheaths of chocolate-coloured cabinet mounts, and had found them to answer very well.

F. W. HART said that there should be a means of indicating

when all the plates in the box had been exposed. A piece of mahogany the size of a plate could be placed so that it came into the front when all the plates were used; it could have a portion cut away so that it could not be lifted, and would at once show that a fresh charge was necessary.

Outings were arranged for July 7, to Broxbourne; and July 14, to Waltham Abbey. It is understood that where no train is specified for these excursions, members leave London by the first train after two o'clock.

It was decided that Camera Stands should be discussed at the next meeting, which will be held on July 17. Members and friends are requested to bring examples.

#### NORTH SURREY PHOTOGRAPHIC SOCIETY.

The usual fortnightly meeting of this Society was held at the West Norwood Constitutional Club on Tuesday evening, July 3rd, W. R. CROSTHWAITE in the chair.

It was decided to inaugurate a series of competitions upon a new system. The competing members will each send in three prints (any process), and the winner will receive all the competing prints as the prize. The Society will judge the prints; each member recording votes for each picture. The competitor having the highest number of votes will be the winner. These competitions will be repeated at suitable intervals if found to work successfully, and will be extended in the winter to lantern slides.

A discussion on shutters followed, the merits and demerits of several well-known shutters being discussed.

Mr. BROMLEY SMITH exhibited Martin's new "Autocrat" shutter, and explained its working.

#### SHEFFIELD CAMERA CLUB.

The monthly meeting was held at 8, Fitzalan Square, on Friday evening last, July 6th, when Dr. MORTON presided.

A suggestion by Mr. Howarth, "That the club should make a photographic survey of the district as regards buildings of historical interest, &c., similar to the plan adopted by the Birkenhead Society," was well supported, and the matter referred to the council.

The development of negatives practically illustrated was then demonstrated by the Chairman, Mr. Winder, and C. Gilley. Several bromide plates, having been previously exposed under various conditions, were manipulated with different formula, and the resulting negatives proved very satisfactory. F. Rawson, C. Newsome, R. Harrop, and others joined in the discussion.

Several proposals of new members were received, and, afterwards, arrangements made for an excursion to Wingfield Manor.

## Talk in the Studio.

ROYAL CORNWALL POLYTECHNICAL EXHIBITION.—The fifty-sixth annual exhibition will open at the Polytechnic Hall, Falmouth, on Tuesday, September 11th, 1888, and the following are the regulations for competition:—(1.) Competitors are divided into two classes: (2.) The First Class consists of members of the Society, and of any person paying three shillings, to be allowed to compete for medals and prizes, who shall be entitled to a non-transferable ticket admitting once to the Exhibition; (3.) The Second Class consists of persons of the working order, and persons under sixteen years of age—Second Class competitors may compete for medals and prizes without any subscription, but are not entitled to free admission to the Exhibition; (4.) No competitor shall be entitled to a medal or prize for any article which has appeared at a previous exhibition of the Society, unless showing some improvement; (5.) Competitors may be called upon to certify that the article exhibited by them is their sole work; (6.) When medals are awarded, the converting them into money according to the following scale shall be at the discretion of the Committee, provided that the applicant already possesses a medal of similar value—First Silver Medal £5, Second ditto £3 10s., First Bronze Medal £2, Second ditto £1 5s.; (7.) Medals only (not convertible into money) can be awarded to patented or registered articles; (8.) No holder of a medal or prize may receive an award of the same or a lower value for similar subjects in the same department at



the next two subsequent exhibitions, but the Committee are empowered to give certificates of merit to persons excluded by this rule; (9.) The Committee are empowered to withhold any medal, prize, or premium, at their discretion; (10.) Every exhibitor must sign the Entry Form, to be obtained of the Secretary, before his exhibit can be received by the Society; (11.) All articles intended for exhibition must be delivered at the Polytechnic Hall, Falmouth, not later than Tuesday, September 4th, or they will not be eligible for competition. *Photography.*—In all cases state whether the work is Professional or Amateur, and name process of production; all work sent for competition must have been executed within eighteen months of the date of this exhibition; carte-de-visite portraits are excluded from exhibition, except when illustrating some special process or novelty. Professional Photographers.—Medals are offered by the Society for meritorious productions in the following subjects: (1.) Landscapes, (2.) Portraits, (3.) Composition Pictures, (4.) Instantaneous Pictures, (5.) Interiors, (6.) Six Pictures in Platinum, (7.) Transparencies for Lantern or Window Decoration, (8.) Pictures by improved processes, (9.) Enlargements. (All enlargements for competition must be the work of the exhibitor.) Amateurs.—Medals are offered for meritorious productions in this department. Photographic Appliances.—Medals are offered for improved apparatus and appliances, including magic lantern apparatus, &c.: all exhibits in this department must be accompanied by a written explanation of their specialities. (Note.—Regulation 7 does not apply to the photographic department for this year.)

*OXIDATION OF SILVER.* By H. Le Chatelier, (*Bull. Soc. Chim.*, 48, 342-345).—When pure precipitated silver is heated in oxygen at 300° under a pressure of 15 atmospheres it is slowly oxidised. The oxidation could not be completed, and the largest amount of silver oxidised was 50 per cent. The decomposition of silver oxide at the same temperature was found to be extremely slow; the pressure increased for three days, and then remained constant at about 10 atmospheres. The tension at which the oxide decomposes at 360° is, therefore, between 10 and 15 atmospheres. At 400-450° silver oxide decomposes rapidly.—*Chemical Society's Journal.*

*SPECTRUM OF THE OXYHYDROGEN FLAME.* By G. D. Liveing and J. Dewar, (*Proc. Roy. Soc.*, 43, 347-348).—The authors examined the third portion of the water spectrum extending into the ultra-violet. The lines fall into rhythmical groups, in which in many cases the distances between the lines measured in wavelengths are in arithmetical progression. They find a striking resemblance between these groups and the groups A, B, and  $\alpha$ , but no exact correspondence, as stated by Deslandres. They have found many of the lines predicted by Grünwald.—*Chemical Society's Journal.*

*PICTURED BY PROXY.*—A Detroit lady, whose friends live abroad, had her baby's picture taken, and sent a dozen cabinet-sized photographs to Europe. Before they went she showed them to friends in this city. "How perfectly lovely!" they all exclaimed; "it looks like a fancy picture. What a beautiful child. I should love to see him!" This from friends who either had not seen the baby or had forgotten how he looked. One lady, whose senses were quite acute, was ready with a startling suggestion. "That child isn't yours, Mrs. —, the photographer has made a mistake. Why, he doesn't look a bit like your little Harry." "H-u-s-h," said the quick-witted mother, it's all right. You know Harry's hair isn't long enough to make pretty bangs, and he really hasn't a nice nose, and I borrowed a baby just his size—a real little beauty, isn't he?—and he has all of Harry's clothes on, and his little ring. Aren't the embroideries lovely? Isn't that little cap just too sweet?" "But are you really going to send this picture away?" "Of course I am. They'll never know the difference, and isn't he lovely? Why, Harry wouldn't take half as pretty a picture, though he is a darling. But you know I want something extra nice to send over there." If this happy thought should include grown people, it will not be half a bad idea. Then professional beauties could sit for homely women, and the science of photography would have achieved a lasting fame. After all, it is generally the likeness in a picture that condemns it.—*Detroit Free Press.*

*PUFFING A PARAFFIN LAMP.*—The following has been sent to us:—"Press Representative. 46, Lloyd Street, Greenheys, Manchester, July 11, 1888. (1 encl.) Private. DEAR SIR,—Kindly insert enclosed in the literary portion of your paper. I can send an electro to illustrate same if you desire it. Please

send copy of the issue containing the notice, and I will show it to Mr. Wells. Seud also charges for a series of advertisements, and best terms of commission to me. I was reporting upon the machinery exhibits at the Manchester and Liverpool Exhibitions.—Thanking you in anticipation, I am, yours truly,—H. J. HUDD, E.K.—The Editor, PHOTOGRAPHIC NEWS." The enclosure is as follows, and its publication may be useful as serving to show its origin to any persons who may see it in other papers:—"The 'Wells Light,' which is being put on the market by A. C. Wells and Co., of Manchester, is just now creating some stir, and it appears to be one of the most important inventions of modern times. The patents are owned by Messrs Wallwork and Wells, who have worked several years to bring this lamp to perfection. By its use an immense white light is obtained from common mineral oils at a cost many times less than coal gas or the electric light. Not the least remarkable feature is its portability, and a lamp giving out the gigantic light of 5,000 candle power can be carried about by two men from place to place! Its use in large out-of-door works cannot be over estimated, and we understand that it is the only light in use through the extensive workings of the Manchester Ship Canal, and that it has been supplied for the most varied purposes to some of the largest firms. With the extensive supplies of oils which are being opened up in all parts of the globe, such a simple apparatus for burning them must have a very large sale in the future."

*PHOTOGRAPHIC CLUB.*—The subject for discussion at the meeting on July 18th will be "Actinometers and Photometers." Saturday outing at Erith.

## To Correspondents.

\*. Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

H. SWAN.—It is very good of you to send us the memorandum, and thanks to you we have repented it.

MAC.—When the rapid rectilinear is too slow for the large direct portraits, you must have recourse to a large portrait lens, which is a very expensive article, and may, perhaps, not give you satisfaction, as you may have been led to expect too much. The falling off in depth of definition and in marginal sharpness will be very considerable, but these will not be held very material faults by those who desire the portraits purely as pictures. As large portrait lenses can often be had second-hand for a small fraction of the original cost, we would suggest that you should advertise, or communicate with the principal second-hand dealers, before ordering.

H. B.—The specimens have been posted to you.

C. G. T.—The red colouring-matter referred to fades very rapidly in a strong light, and is quite unsuited for the purpose.

W. J. H.—We are glad to hear that there is such a good prospect of success.

JAMES.—1. Use equal parts of a saturated solution of nitrate of silver and glycerine. 2. The paper is sized with gelatine, and the circumstance accounts for the appearance. 3. Try a strong solution of shellac in alcohol.

STANDARD.—Write to the secretary of the Photographic Society at 5A, Pall Mall East.

ADOLPH JANSSON.—Although the apparatus is excellent value for the small price charged, it is not an apparatus which can be recommended to those who can afford to pay more. It is quite possible to take an excellent photograph with it.

## The Photographic News.

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# THE PHOTOGRAPHIC NEWS.



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### THE EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE next Exhibition of this Society for 1888 will be held in the Gallery of the Royal Society of Painters in Water Colours, 5A, Pall Mall East, London, and will be inaugurated by a *Conversazione*, open to members and their friends, on Saturday evening, the 29th of September, at 8 p.m.

The exhibition will remain open daily (Sundays excepted), from Monday, the 1st of October, until Wednesday, the 14th of November. Admission (from 10 a.m. till 5 p.m.), one shilling. It will also be open every Monday, Wednesday, and Saturday evening; admission (from 7 to 10 p. m.), sixpence.

At the back of each frame must be written the name and address of the exhibitor, with the title or description of the picture, and the number (if there be more than one) to which it refers in the entry form. Each frame or picture may have the exhibitor's name, and the subject of the picture, neatly inscribed, but no address or anything in the shape of an advertisement will be permitted. Pictures in Oxford frames, and pictures previously exhibited in London will not be admitted.

Each exhibitor of photographic apparatus must fill up the entry form (supplied by the Society), and write a concise description of each piece of apparatus, and on the exhibit itself a removable card must be attached, containing the name of the exhibitor, and the number to which it refers in the entry form. Attention is requested to this regulation, as, without it, difficulties arise, and the apparatus may not appear in the catalogue. The exhibitor should fasten on each exhibit a small adhesive printed label, containing his name only.

The Council will refuse apparatus and appliances that have been already shown at London exhibitions, and that do not embrace some points of special interest to be mentioned by the exhibitor on the entry form.

Photographs coloured by scientific or mechanical means will be admissible. Photographs coloured by hand will not be admitted. Negatives and transparencies will be admitted.

No charge will be made to members of the Society for exhibiting their pictures; but to non-members, a charge of one shilling per square foot will be made for wall space; the minimum charge being five shillings. It is requested that postal orders to pay for the wall space required by non-members be enclosed with the entry form; and should any of the pictures sent not be hung, the due proportion of wall space charge will be returned. The charge for wall space to those exhibitors who may become members of the Society at the November and December meetings will be remitted, and the amount paid credited to their entrance fee and subscription. No charge for wall space will be made to foreign exhibitors.

The apparatus being now under the personal supervision and explanation of a competent attendant during the whole time the exhibition is open, a fixed charge is made of five shillings to members, and ten shillings to non-members, which in all cases must be enclosed with the entry form, or such apparatus will not be received.

Exhibits sent in packing cases (carriage paid) must be addressed to the "Photographic Society of Great Britain, care of James Bourlet, 17, Nassau Street, Middlesex Hospital, London." Packing-cases may be sent before Wednesday, September 19th, but they will be too late if received after that date. No packing-cases can be received at the Gallery.

Exhibits (including pictures, negatives, transparencies, lantern slides, apparatus and appliances, &c., sent by hand) will be received at the Gallery, 5A, Pall Mall East, on Wednesday only, September 19th, until 9 p.m.

Slides sent in to stand on the table during the Exhibition will also be shown in the optical lantern; they must therefore be so framed as to be removable unless duplicates be sent.

Photographic lantern slides will be shown with the Society's optical lantern during the Exhibition. Slides are invited to be sent for this purpose; they must not exceed 3½ inches in height, and, to enable the Committee to select and arrange them, must be delivered at the Gallery not less than one week before the evening of their being shown in the lantern.

It is to be distinctly understood that the sending of exhibits signifies acceptance by the exhibitor of the decision of the Council upon all matters connected with the exhibition, as absolute and final. The Council do not hold themselves responsible for any damage that may happen to the pictures, or other exhibits, whilst in their custody, but they will take every precaution to insure their safety and prompt return to the owners at the close of the Exhibition. To avoid damage to frames, exhibitors are requested to have sunk backboards to their frames, with the fastening nails not projecting, and the whole covered with thick brown paper.

Application for entry form must be made to the Hon. Secretary, Photographic Society of Great Britain, 5A, Pall Mall East, London, S.W.

### DOWNES V. FALLOWFIELD.

THIS important case, which has for some time been before the law courts, came on for further consideration before Mr. Justice Manisty on Monday. It will be remembered that Mr. Downes, a photographer at Sleaford, brought an action against Mr. Jonathan Fallowfield, of the Lower Marsh, Lambeth, to recover damages for the injury done to his business, resulting from the supply to him by the defendant of card mounts which contained matter (alleged



to be bronze powder) injurious to photographic prints. When the case was heard in October last Mr. Justice Manisty suggested that, as it contained many technical points, it could be best settled by a scientific expert. The case was accordingly referred to Dr. Frankland, who, after hearing the evidence on both sides, made his report. This report was submitted to Mr. Justice Manisty, and the case came on for further consideration, as above stated.

The most important point of the report ran thus: "I am of opinion, and I have to report, that a portion of the injury to the plaintiff's photographs was due to spots, and that those spots were caused by a defect in the cards as supplied by the defendant; but the remaining portion of the injury was due to fading, and not caused by any defect in the cards as supplied by defendant."

This was admitted to be virtually a condemnation of the mounts, and a verdict for the plaintiff. It became a question now for Mr. Justice Manisty to assess the amount of damages.

This, however, his lordship declined to do. We understand that Mr. Downes was prepared with evidence on the point, but the judge adhered to his dictum, and urged that a compromise should be come to; if not, it must be again referred.

A conference then took place between Mr. Greene, Q.C., (plaintiff's counsel), and Mr. Finlay, Q.C., who represented the defendant, but no result was arrived at.

Mr. Finlay then asked for an adjournment for ten days, in order to allow time for communication with the German firm who manufactured the mounts, and who, it was understood, would indemnify Mr. Fallowfield.

To this proposition, however, Mr. Justice Manisty refused to accede.

"Then," said Mr. Finlay, "will you see Mr. Greene and myself for two or three minutes in private?"

His lordship declined, observing that the learned counsel could advise their clients very much better than he could.

Ultimately it was decided to postpone the case for ten days, so that the parties in Germany might be communicated with, Mr. Justice Manisty again urging the wisdom of a compromise.

## THROUGH JAPAN WITH A CAMERA.

BY W. K. BURTON

### CHAPTER II.—HAKODATTE.—JAPANESE HOTELS.

THE second largest island of Japan is immediately to the north of the mainland, and is called Yezo. To the south of it, facing the mainland, is the town of Hakodate, which is one of the "open ports," that is to say, one of the ports where foreigners are allowed to live without a special passport from the Japanese Government.

To Hakodate we made our way as a starting point for our southward tour. The journey from Yokohama, the seaport of Tokio, was by steamer, and occupied some sixty hours. Although Hakodate is an "open port," it is very little used by foreigners. I think there are twelve Englishmen in the place. Whilst I was there there were thirteen English men-of-war in Hakodate bay. I don't know what they were there for, but, I presume, it was "to protect British interests." If that is the case, "British interest" ought to feel gratified. There was, it will be seen, one gunboat for each Britisher in Hakodate, and one over "for luck." As a matter of fact, Hakodate is not in the least Anglicised as Yokohama is, nor have European customs been introduced to at all the same extent that they have even in Tokio. In the latter place all the people with whom I have come in contact officially are greatly European in their customs, and of the domestic life of the remainder of the people I had seen little but what may be seen from the streets—which, however, is considerably more than one might imagine, as the Japanese have no idea of privacy. The houses are, in

summer time at least, almost quite open to the street, and all that goes on inside is visible.

Arrived at Hakodate, we betook ourselves to a Japanese hotel, and, as this was my first experience of such an institution, I may as well describe it. It was a house, generally of two stories, built entirely of wood, and commonly ranged round the whole four sides of a small enclosed court, which is usually arranged as a sort of grotto or rockery, with miniature ponds full of gold fish, little bridges from stone to stone, and so forth. The rooms all "round the square court," if I may be allowed so to express myself, are separated from each other only by sliding screens, sometimes covered with the diaphanous paper which is used in place of glass in Japanese windows; sometimes with opaque paper. There is generally a further means of communication between the rooms—without opening the sliding doors between them—that is, by a sort of verandah or balcony, extending completely round the house at the level of the rooms. There is commonly a second balcony round the court side of the rooms also. The ground floor may be said to consist of a sort of platform raised about eighteen inches above the ground level. The whole of the front of the house is commonly open, and in second-rate hotels this open part is used as the kitchen—that is to say, there is a hole, some feet wide, in the platform, within which a fire of charcoal is kept burning; there is no chimney, and there are no visible cooking appliances beyond a few pots and pans and an arrangement for suspending a large kettle at an adjustable height above the fire.

On entering the hotel—or any Japanese home—one takes off one's boots or shoes. The floors are all (including even the kitchen) covered with straw mats; and it is a rule, to which exceptions appear never to be made, that before putting one's foot on these mats one removes his shoes. Apparently a Japanese of the most exalted rank will do this before entering the humblest house.

The bed-rooms—or rooms, rather, for the same room serves as bed and sitting-room—are absolutely without furniture in the sense in which we understand it. Everything is done on the floor. One eats on the floor, sits on the floor, sleeps on the floor, and hangs one's clothes on the floor. I, being unable to assume such a position, was necessitated, when I had to write, to lay myself full length on my stomach on the floor, the paper in front of me. This position is trying after a time. There were no washing utensils either, nor even a mirror. One either washes only in the bath—of that great institution in Japan, the bath, I shall have more to say hereafter—or is supplied with a shallow brass basin, of the shape of a dinner gong, which he uses out on the balcony.

Of Japanese food and the manner of eating it I will also have to speak, but meantime I may say, of the sleeping, that at night-time there are brought into the room, that has so far served as sitting-room, two quilts, on one of which one lies, and with the other of which one is covered. The Japanese pillow is a curious article, which undoubtedly had its origin when both men and women wore elaborate hair-dresses which could not be laid on an ordinary pillow without being destroyed. The men, for the most, have given up the habit of the peculiar hair arrangement, and the women only use the pillow of necessity; but the men appear for the most part still to use it from choice. The process consists simply in laying one's neck on the thin edge of a wedge, a process quite intolerable to a European, even when the sharpness of the edge is reduced by the use of a roll of cloth considerably thicker than a good-sized cigar. The pillow is used for resting in the day time as well as for sleeping at night—much as lazy people at home use a sofa.

Commonly, only such pillows were provided at the smaller hotels that one stopped at, and I had to manage by rolling up the upper quilt—which was not at all wanted as a covering in the hot weather—into an extemporised pillow.



Over each bed is erected, by the aid of cords fastened to the walls of the room, a great canopy of mosquito netting called "ka-ya," which is translatable as "mosquito house." This netting is really quite necessary, as in the hot weather the mosquitos, without it, make sleeping quite out of the question. Indeed, there are other animals besides these—not to mention beetles, &c., which, I presume, are quite harmless. I remember, one night, I stacked my camera in a corner of the room; next morning, on looking at it, I saw a bright-eyed, brilliantly coloured frog squatting on the tail-board, calmly surveying the little world around him. Now I know that frogs are not in any way poisonous, but they are not exactly desirable bed-fellows. The room was on the first floor, and how Sir Frog had reached the place he occupied I cannot imagine; but he was a great jumper. When he perceived that I saw him he made one leap and was off.

What I have described is a typical Japanese hotel of a good class, but quite unadulterated with foreign importations. We had experience of everything between such a hotel and one in which there were tables and chairs and structures which the hotel-keeper evidently imagined were like European beds. Let me say here that although it is impossible to pretend that, to me, there was not some discomfort in the mode of life in the Japanese hotels, I very much preferred those that were "out-and-out Japanese" to those that were half Japanese and half European.

So much for the hotels. For reasons, which it is rather difficult to describe, I could never get a photograph which appeared to me would be of use in conveying an idea of a Japanese hotel to one who had not seen such. I could neither make one nor find one.

In a purely Japanese hotel we found ourselves in Hakodatte, and presently we began to receive visitors in the manner customary in this country, which I must describe. It was my first experiment of this thing, and was rather trying.

We were seated—on the floor of course, as there was nothing else to be seated on. When a visitor appeared he squatted down opposite to us, placed his hands on the floor in front of him, and lowered his head till his forehead rested on the back of his hands. He remained in that position for some ten or fifteen seconds, raised his head and said some words of greeting, and did it all again.

After this formality is gone through, tea is always brought in. The drinking of tea is a thing that occurs at every conceivable occasion with the Japanese. There is scarcely a house of any kind—hotel, tea house, private house, or even shop that one enters—but the first operation is that of drinking tea. It is also brought into one's room the first thing in the morning.

The tea is quite green, the fluid the slightest greenish yellow colour only. It is made in very small pots, and is poured into the minutest conceivable cups, which are, moreover, only half-filled—about a teaspoonful of tea is the ordinary dose. It is drunk without milk or sugar, and is to me a very pleasant beverage—that is, when I take it as a drink. The tea drinking that I have been describing must really be looked on rather as a formality than anything else, the doses are so very homeopathic.

My attempts to return the salutes were, I am sure, somewhat of failures. In the first place, I felt sure that there was a great want of "ease and elegance" somewhere. Moreover, there was a tendency on my part to roll over on one side, which was quite embarrassing. Besides all this, I had arrived in Hakodatte with a severe headache, and I found laying my forehead on the ground in manner described so aggravated the complaint that I presently gave up all attempts to conform to the customs of the country, and stood up returning the salutes in the English manner.

The good citizens of Hakodatte presently put at our disposal the "club," a large building in European style, so till we left Hakodatte I did not actually enter on the Japanese mode of living.

## NOTES FROM NEW YORK.

### REDUCING AND INTENSIFYING NEGATIVES—MEETINGS OF THE NEW YORK SOCIETY—COMBINED SHUTTER AND DIAPHRAGM.

"ENGLAND through an American Camera," was the subject of a very interesting illustrated lecture given before the New York Amateur Society by one of its members, Rev. E. C. Bolles, on June 1st, and was largely attended. He had some excellent views of some of the old streets in Liverpool, taken early in the morning, also others of the ruins of a few of the old abbeys. Altogether the lecture proved to be very enjoyable, and it is probable another will be given in the Fall, illustrating a trip up the Thames.

On June 7th a smoking concert was given, when Mr. Stebbins entertained the members by giving instrumental music. A glee club from the 7th regiment also rendered some excellent vocal music.

At the regular meeting of June 12th President Canfield read an interesting paper on the "Increasing and Reducing Density in Gelatine Negatives," by John Bartlett, of Philadelphia. Some of the points mentioned were that it was advisable first to clear or slightly reduce a negative with an extremely weak solution of perchloride of iron, then wash and intensify with 30-grain solution of nitrate of silver and gallic acid. If there was a slight opalescence it was due to some trace of hypo not eliminated by the perchloride. It can be easily wiped off from the face of the negative by absorbent cotton. By this process it was very easy and certain to reconstruct a weak negative. The advantage of the perchloride of iron was that it eliminated the hypo and cleared the film of any inherent fog it might have, furnishing an excellent foundation to build upon with the silver. In warm weather the following formula was advised:—

#### *Reducing Solution.*

Perchloride of iron (crystals) ...	4 grains
Citric acid ... ..	4 "
Water ... ..	1 ounce
Chrome alum ... ..	2 grains

#### *Intensifying Solution.*

Gallic acid ... ..	80 grains
Alcohol or glycerine ... ..	1 ounce

#### *Silver Solution.*

Nitrate of silver ... ..	30 grains
Water ... ..	1 ounce

Let the silver solution run well until all organic matter is thrown down. For use, add 1 drachm of silver and 1 drachm of the gallic acid solution to 1 ounce of water.

Quite a discussion followed as to the merits of the proposed plan. Dr. Ehrman, who was present, remarked that he was afraid of the perchloride. He thought it might reduce too much of the image, and might render the film more unstable. He much preferred the reducer lately advised by Bellitsky, which was endorsed by Dr. Eder, as it was very gradual in its action. He liked it better than Farmer's red prussiate of potash solution. It is as follows:—

Potassia-ferric oxalate ... ..	10 grammes
Ten per cent. hyposulphite soda solution ... ..	100 cubic cents.

What the chemical function of the hypo was in this particular solution the doctor was unable to explain. He hoped the matter would be investigated, and the President thought it an excellent subject for some of the committees to consider. H. J. Newton and some others preferred the single solution iodide of mercury intensifier. Mr. Newton thought it was better to wash the negative well to eliminate the hypo, or else treat it to a weak nitrate of lead solution, than when it was dry intensify with the mercury. Mr. Beach argued that amateurs were often



liable to insufficiently wash their negatives, and when intensified with the iodide of mercury solution they (the plates) would in time turn yellow and be slow printers. He preferred Monckhoven's cyanide of silver intensifier, since it was much quicker in its action, and gave to the negative a rich blue colour, which was desirable for quick printing. Dr. Ehrmann thought, in reply, that it was an excellent intensifier for line work, but too hard for portrait negatives. He used mercury and ammonia for these.

Dr. Ehrmann then gave a brief explanation of the origin of the so-called aristotype paper, stating that as far back as 1865 he had made it, but that it was now coming into use. Obernetter, he believed, was the first to introduce gelatino-chloride of silver paper. It was a great improvement over albumen silver; all the fine details in a negative were fully brought out, but the great difficulty was, it was very hard to tone. About four years ago Liesegang brought out the aristotype paper, which is simply a paper prepared with a substratum of barium, and coated with a chloride of silver colloid emulsion. This has met with much success, and as the picture is entirely on the surface all the fine details are preserved. The details in the dense portions of a negative are readily brought out, and much better than with albumen paper. It tones quicker and easier than albumen. If toned too much it makes a bluish grey. For black tones it must be printed deeper, and the colour of any tone must be judged by viewing the print by transmitted light. By reflected light it looks red. The toning bath usually recommended is made of sulphocyanide of ammonium and gold. The prints fix rapidly in a hypo bath of

Hypo	...	...	...	1 ounce
Water	...	...	...	20 ounces

After fixing, the prints only need to be washed for five minutes to eliminate the hypo. Before printing, the paper should be trimmed to the proper size. The prints should be moistened before mounting, and burnished whilst moist, otherwise they will be liable to crack. If a mixed hypo and gold bath is used, the prints will be apt to turn yellow. One gentleman remarked that he had recently tried some paper he had kept over a year, which he obtained from Liesegang, and found it worked very satisfactorily.

Dr. H. G. Piffard showed a few prints he had quickly made on some special paper, which were very good. Submitting a specimen to Dr. Ehrmann, the latter declared it was gelatine-chloride paper. Mr. Newton remarked that if a little nitrate of lead was added to the combined hypo and gold toning and fixing bath, it would probably prevent the prints from turning yellow. If half a grain of nitrate of lead is added to the hypo bath, it will bring up an under-toned silver print. Some further interesting discussion took place, and specimen prints on what is termed "Aristo" paper were passed around, which were very beautiful. The President made a few announcements, speaking of donations of photographs to the Society by Messrs. R. H. Lawrence, Wm. H. Stebbins, and Franklin Harper, also of the introduction of the Welsbach Incandescent Gas Burners through the kindness of Mr. Stebbins. He then introduced Mr. John J. Ackworth, of London, England, who said a few words in regard to the Alpha Paper made by the Britannia Works, Ilford. The President ordered a recess, and Mr. Ackworth demonstrated before the Society the practical advantages of the paper. He had mounted on a board of hard wood a by-pass gas burner, and in the wood at certain distances from the burner were holes, into which set a wood standard, having on its upper side flat spring clamps intended to hold in a vertical position the printing frame. The advantage was, that it made a portable device which could be set on any table or support, and enabled the operator to locate the printing frame accurately at a fixed distance from the source of illumination. He connected the burner by a rubber tube to the ordinary gas fixture in the room, and

made three exposures of about forty seconds each. Mr. Beach had prepared the solutions for the manipulations. The prints were first dipped in water, then developed very slowly with ferrous oxalate, and toned and fixed in one bath. The toning took about ten minutes; when done, they presented a warm brown colour. The paper is at least five times slower than Eastman's bromide paper, and may be developed and operated by a large volume of yellow light without danger. The manipulation by Mr. Ackworth was quite successful, and interested many of the members. The following were the solutions used:—

No. 1.—Oxalate of potash	...	...	2 ounces
Bromide of ammonium	...	...	40 grains
Warm water	...	...	8 ounces.
No. 2.—Sulphate of iron	...	...	195 grains
Citric acid	...	...	21 "
Water	...	...	8 ounces.
No. 3.— <i>Clearing Bath.</i>			
Alum	...	...	190 grains
Citric acid	...	...	43 "
Water	...	...	8 ounces.
No. 4.— <i>Toning and Fixing Bath.</i>			
Water	...	...	10 grains
Hypo-sulphite soda	...	...	212 ounces
Acetate of soda	...	...	218 grains
Sulpho-cyanide of ammonium	...	...	109 "
Powdered alum	...	...	40 "
Chloride of gold	...	...	4 "

The latter became milky after standing, which does not, however, affect its working qualities. The developer recommended is one part of iron to three of oxalate.

Mr. Beach exhibited a new combined iris shutter and diaphragm fixed in a lens tube between the front and back combination, which he said was the invention of Mr. Edward P. Bausch, of Rochester. It was remarkably compact and effective. A series of thin metal leaves of segmental shape are pivoted near the circumference of the tube, one superimposed over the other, all being connected together in such a manner that the movement of one will impart simultaneously motion to all the others. One leaf is connected to a vertical pivoted lever, having in its upper end a slot in which moves the rotating pin of the propelling spring drum. As the lever is moved by the drum to one side and back again, it causes the series of leaves in the tube to open and close, thus making the exposure. It resembles very much Dallmeyer's latest patent iris diaphragm and shutter. Suitable mechanism is provided for making a time or instantaneous exposure, also for regulating the throw of the lever so as to regulate the size of the diaphragm. The workmanship was of very high order. The instrument was very favourably commented upon by those who examined it.

Mr. Tisdale explained and exhibited his simplified form of detective camera, and President Canfield exhibited the latest improved Scovill detective machine. There were several noteworthy features in each which attracted attention and made the apparatus more effective.

The old question of mat marking appears to be coming up again, and manufacturers are receiving suggestions as to their elimination.

An informal talk on lenses was indulged in by about a dozen members of the Society on Monday evening, June 18th. Mr. Beach presided, and Mr. Leaming made the principal address on the subject. He devoted himself mainly to the advantages of the single landscape lens, regarding it as by far the best for this class of work. He maintained that they were quicker than rapid rect. lenses of the same focus, and advised using as large a stop as possible, consistent with definition, for the reason that brilliancy and a better atmospheric effect were thereby obtained. He also advised the use of the double swing back to assist in obtaining sharpness in certain portions of a foreground. Mr. Beach thought there were many ex-



cellent qualities in the landscape lens, but advised the use of a small stop and a fast plate, instead of Mr. Leaming's advice of a large stop and slow plate, on the ground that with a fast plate one had greater resources for an emergency.

On Friday evening, June 22nd, the last lantern exhibition of the season was given at the rooms of the New York Society of Amateur Photographers, and comprised forty-two slides selected from the Pittsburgh Amateur Photographers' Society, eighteen from the Brooklyn Camera Club, forty-eight from the Philadelphia Amateur Photographers' Club, and a few contributed by members of the New York Society. Owing to the extreme hot weather at the time, the attendance was somewhat smaller than usual. Among the Pittsburgh slides that proved interesting were a series of pictures representing a Spanish Bull Fight, also "Afternoon Mail at Hot Springs," "Morning Glories," picture of a cow called "Warranted a good Milcher," "Salmon Run, Pittsburgh," "View in Alleghany Park," "Melting Room of Steel Works, Pittsburgh" (a very good interior in its way), a curious picture of a "Wrecked Locomotive," and an interesting group of girls in a boat entitled "Ferry Across Beaver River."

Of the Brooklyn Camera Club's slides, those entitled "A Trec Top," "Bathers' Bay Ridge, N. Y.," "Landscape at Hilton, N. Y.," by W. F. Miller, and "Cattle," by L. Prosch, were the best liked.

In the Philadelphia Clubs' collection, those most admired were "Gateway Entrance to a French Village," by L. Roberts; "Paper Mills," "Niagara Falls from Canada Side," by A. J. Thompson; "Window Garden, Geneva, Switzerland," "Stone Bridge," Lens, France, by L. Roberts; "Summer Time," by F. P. Chase; "Dairy Farm House," "French Gypsies, near Medina, Pa.," and "Cottage at Wester, Pa.," by Alfred Clements; a group entitled "Amateurs," and "Delaware Valley above the Gap," by W. A. Hanin; he also had two comical photographs called "Chernubs," and "Water-Melon Season." "A Southern Home," by F. G. Stuart, was a splendid picture of darkey life. There were also "A Normandy Cottage," and "Normandy Cottage-Door," by A. Clements, which were especially admired.

In the New York Society slides were "Return of the Fisherman," "Fisherman's Village, Seabright," and "Waiting for a Friendly Wave," being instantaneous studies, by Dr. Nagle. They were very much liked. Mr. Frank Cobb had an excellent view of the fountain in Central Park, and a group called "Summer Afternoon."

F. C. Beach contributed four slides, mostly of country snow scenes, those called "March Snow Bank," and "Winter Scenery at Stratford," the latter showing a very pretty ice effect in the trees, were very pleasing, and excited interest.

"Winding Through the Woods," by W. A. Singer, was a very effective slide. Mr. Chas. Simpson had four excellent slides of the Female Viennese Fencers, dressed in special costume, also of the "Murphy Bandanna League, returning home from St. Louis." His set closed with a view of Mayor Hewett reading his address at the unveiling of the Garibaldi statue in Washington Park. He sent a copy to the Mayor, who replied by letter that it was so well done that he had sent the copy to his wife abroad as a memento.

One slide of a team of oxen hitched to a cart, by Mr. Wm. Murray, was particularly good, and concluded the entertainment.

The lantern was very satisfactorily operated by Mr. Walter Singer and Mr. Chas Simpson, while Mr. Beach announced the titles.

President Canfield made a few announcements, and remarked that there would be no more formal meetings till next September, but the rooms would be open every day during the week, ready for the use of members.

New York, June 27th, 1888.

SULPHITE.

## ENLARGING.

BY CHAPMAN JONES.

ALTHOUGH probably all the methods of enlarging that are generally known are practised at times by those who make a speciality of this branch of photography, the method that most professional enlargers prefer, when circumstances are not contrariwise, is to print a carbon transparency, and from this to prepare a wet collodion negative of the size required. This process has a special advantage when the final print is to be in carbon, because a laterally inverted negative suitable for single transfer printing is obtained, unless indeed the transparency is placed with its glass side towards the lens in making the enlarged negative.

If an enlarger were asked why he preferred this method, he would probably at once give the almost stereotyped reply about the superior brilliancy of a carbon transparency, and doubtless be able to make good his point with examples taken at random from the clichés waiting for his attention.

If we accept the experience of practical men, there can be no doubt that a carbon transparency is more brilliant and perfect in half tone than a transparency made on a gelatino-bromide plate, and an inspection of the average productions by each process would confirm the idea. But is it of necessity so? This question can scarcely be answered in absolute terms, though there are many points in connection with it that are worth consideration.

It may be taken for granted that the great desideratum in a transparency for reproduction purposes is a perfect rendering of the gradation of the original negative. Given this and sufficient vigour, the thinner the transparency is the better, that the exposure for the enlarged negative may not be more tedious than necessary.

Now the carbon process lends itself very kindly to the attainment of these conditions. The light effect upon the tissue under the negative is for all practical purposes proportional to the transparency of the various parts of the negative, and the subsequent development consists in merely dissolving away the gelatine with its pigment that is in excess of that required to form the picture. The general thinness or otherwise is controllable within certain limits by the temperature of the water used and the time of its application in developing. So that it may be said in general terms that after the necessary manipulative experience is gained, it is easy to make a good carbon transparency. The liabilities to error are not so much in the gradation of opacity, as in the general density and the difficulties that are peculiar to the process, so that if a transparency is usable at all it is generally of good quality.

But in the making of a transparency on a gelatino-bromide plate the case is widely different. There is a marked tendency among operators to develop gelatine plates in as short a time as possible, and with little, if any, variation in the proportions of the reagents used. Rapid development invariably results in a tendency to loss of gradation in the high lights or in the shadows, or in both when the required range of opacity is considerable. That is, there is either over-exposure at one end of the scale, or under-exposure at the other. But it is possible to obviate this drawback in great measure, if not entirely, by giving a full exposure and by using a developer that is gradually increased in power, so that it shall at all stages of the operation be suitable to the exposure received by that part of the plate where the detail is beginning to appear. And as detail when it first appears is not generally of printing value, it is not always possible to get good gradation in the lights of a transparency without fogging the highest lights. By pushing development far enough, and then, if necessary, working back with a reducing solution, this difficulty may be overcome.

Thus, while there is little room for doubt that in general practice a carbon transparency is far superior for re-



producing and enlarging purposes to a transparency made on a gelatino-bromide plate, there does not appear to be any sufficient reason why it should be so, if patience and skill are brought to bear upon the production of the latter. And where a transparency is only occasionally required, it ought not to be claimed as an excuse for inferior work that nothing better than a gelatino-bromide plate was available for the purpose.

## Reviews.

SERIES OF CARBON ENLARGEMENTS BY G. W. WILSON and Co., Aberdeen.

MESSRS. WILSON and Co. deserve credit for energy in the production of a series of large carbon photographs of stock subjects, the size being 24 by 18 inches, the series comprising London and the Thames, English cathedrals and abbeys, Oxford and Cambridge, besides a host of Scotch subjects.

It is quite clear that Messrs. Wilson have thoroughly mastered the difficulties of the carbon process, as the prints are fully gradated through all the series of tints. The 24 by 18 carbon enlargements sell for 12s. 6d. unmounted.

We are glad that Wilson and Co. are putting this magnificent series of permanent photographs on the market just at the present time, as it will help towards rescuing photography from the disgrace cast upon it by those firms who unblushingly sell fugitive silver enlargements as permanent photographs.

KRISTALINE, A VARNISH. (J. E. Hartley, 13, St. Paul's Square, Birmingham.)

THE above-mentioned firm sends us a sample of a colourless lacquer sold under the name of Kristaline, and which has been largely in use as a protective coating for metal goods, and they are now introducing it as a varnish for photographic purposes.

As far as we can judge from the inspection of a varnished opal photograph sent us, and from some experiments we have made, the varnish in question is an excellent one, the coating being hard and moisture-resisting. Still, time affords the only real test of the merits of a varnish. It is not necessary to warm the plate, and the varnish flows very easily; no difficulty being experienced in obtaining an even film.

## ON PLATINOTYPE DEPOSITS.

BY CAPT. W. DE W. ABNEY, C.B., R.E., F.R.S.\*

A GOOD deal has been said lately on the merits of hot and cold development of platinotype prints, and it has been stated that for weak negatives cold development is best, as giving greater gradation. Deeming that the present time is not *mal à propos* for a discussion of the subject, since we are threatened with having to develop all our platinum prints at the ordinary temperature of the room, by Mr. Willis's new plan, I have brought forward the following short paper, before the interest in the old method has entirely waned.

I know of no better plan of trying any experiments on the relation existing between density or blackness of image, and exposure, than to use a sensitometer on Spurge's principle, since in it we have a knowledge of the relative intensities of light we are dealing with from the absolute measurement of the apertures through which the light reaches the sensitive surface. I would remind the members that Mr. Spurge fixed the apertures so that at every third number of the scale the exposure was doubled (see *Photographic Journal*, June, 1883). The ratio of the areas of the 1st hole to the 2nd was 1 to  $2\frac{1}{3}$ ; of the 1st to the 3rd, 1 to  $2\frac{2}{3}$ ; and of the 1st to the 4th, 1 to 2. A sensitometer of this description can be made approximately in this ratio by following the method suggested and carried out by our

Hon. Sec., Mr. Donkin, who exhibited a sensitometer of this description at the Camera Club Conference.

The sensitometer I myself employed was one Mr. Spurge's model. Having got the sensitometer with which to regulate the exposure, the question came as to how the density or blackness of image on the platinotype paper could be measured. It may be in the recollection of some of the members present that in January, 1887, I gave a plan which enabled the density of deposit of negatives to be measured, and I adopted a modified plan based on the same principles for the purpose I had in view. Such an apparatus I exhibit to-night. It is very simple—so simple, I am afraid, that I can hardly hope it may be new, and yet I have never yet seen it described.

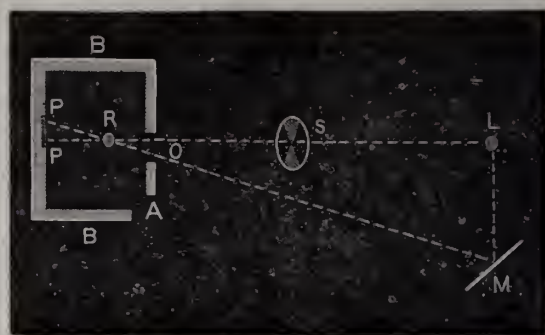


Fig. 1.

L is a source of light, either an argand paraffin lamp or incandescent electric light (a candle will do). The beam of light passes through a rectangular opening, O, in a box, BB, as shown, in which a rod, R, stands. The light casts a shadow of R on the end of the box at P; at M is a mirror which reflects the light through the same rectangular orifice O, and casts another shadow at P'. By regulating the distance of the mirror M from L, or of the rod R from the end of the box, the two shadows may be made to touch; also by regulating the distance of M from the box the relative darkness of the two shadows may be made to vary as much as we like. I always make the shadow cast by the reflected light, and illuminated by the direct light, to be more than twice as bright as that cast by the direct light and illuminated by the reflected light.

By placing rotating sectors between L and the aperture O, the two shadows, when cast on white paper, can then be made equal in brightness. To view the shadows a circular hole is cut at the corner of the box as shown at A. The reason for thus enclosing the shadows will be seen presently. Suppose it is desired to measure the blackness of a tint on the platinotype paper, the tint to be measured is placed so that the shadow of the rod cast by the direct light, and which is illuminated by the reflected light, falls upon it, and alongside a piece of the same paper, but white, is placed so that the shadow of the rod from the reflected light, and which is illuminated by the direct light, falls upon it. The junction of the two papers is also made to fall exactly at the place where is the junction of the shadows. The rotating sectors S are then closed or opened till the shadow on the blackness of the two shadows appear equal. The mount to which the sectors are closed is then read.

It should be stated that previous to the measures being taken, equality of shadow on white paper alone is established, and the amount of opening of the sectors is read, and that this is the standard. In a case which I shall bring before you presently, to establish equality, on white paper the sectors had to be opened to  $72\frac{1}{2}^\circ$ ; and in one, that on platinotype paper, they had to be opened to  $38^\circ$ . That showed that this tint was only  $\frac{1}{3}$  the whiteness of white paper. In the ordinary Rumford method of photometry, of which this is a modification, it is unnecessary to exclude any extraneous light, since if there be any it illuminates the two shadows equally; but in this case all extraneous light must be rigidly excluded, since the two shadows would not be equally illuminated by it—the white paper would have a greater brilliancy given to it than would the tint. The small box shown in fig. 1, when used in a dark room, answers perfectly to screen off all extraneous light; in fact, white paper is practically invisible when the rotating sectors are closed.

\* A communication to the Photographic Society of Great Britain.



This method is also applicable for the measurement of the luminosity of coloured pigments. By placing a pigmented paper in place of the platinotype tint the equality of luminosity can be readily ascertained by rapidly opening and closing the sectors, which with this form of instrument is possible.

This plan, then, that of measuring the blackness of platinotype tints, I have had in constant use for some time past, and have found it most useful in certain actinometric observations which I have made during that time, and which I hope to publish shortly. We can reduce, by this means, all tints to the amount of white light reflected from them, compared with that reflected from the white paper on which the tint is produced. It seems to me this is a great improvement on the plan, usually adopted, of ascertaining the value of shades by means of standard tints. The accuracy of measurement is astonishing when carefully carried out. My assistant, Mr. Walter Bradfield, reads so accurately that a difference of 1 per cent. from the mean is rare, and I myself am nearly as close in my readings; and I commend it to the notice of those who have to compare shades. By viewing the tints through red or blue glass the shades of tints on albumenized paper may readily be compared. The intervening medium is apt to cause a greater divergence than that where the tint is black, but even then it is more accurate than the standard tint principle.

To come now to the experiments made with hot and cold development.

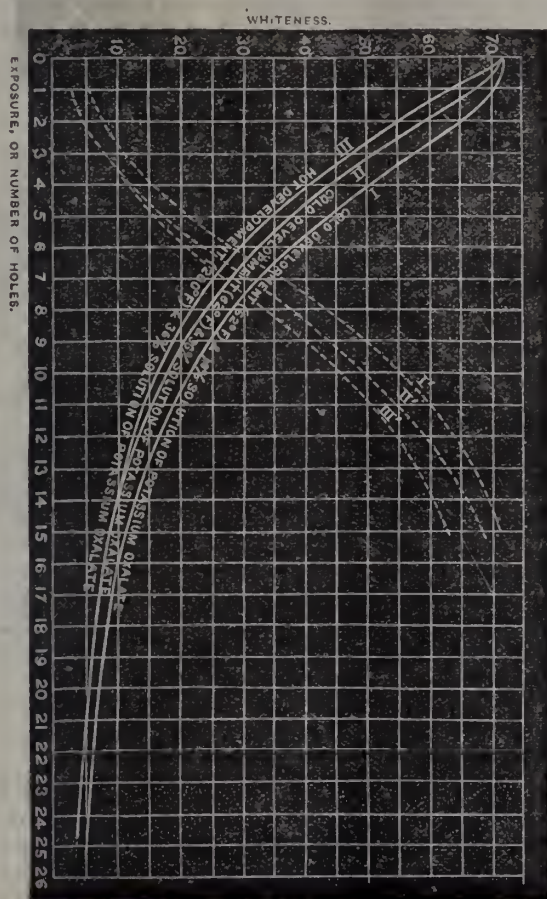


Fig. 2.

A paper was exposed in the sensitometer, and developed with 130 grains of potassium oxalate (36 per cent. solution) at about 62° F., and the dotted curve II' shows the result. A paper was then exposed for half the time, roughly, and developed at 180° F., with 130 grains of potassium oxalate to the ounce of water. Curve III' gives the result. Curve I' shows a print from the same paper developed at 62° F., and with only 65 grains of potassium oxalate to the ounce of water. The light acting on this paper was identical with that acting on the paper which pro-

duced Curve III'. With hot development the diminution of strength of developer did not produce any marked difference from the curve obtained by hot development with the 130 grains to the ounce of potassium oxalate. In the diagram the horizontal scale is the number of the hole of the sensitometer, No. 1 being the largest. Curves I, II, and III, are formed from curves I', II', and III', the horizontal scale in this case measuring the relative times of exposure. The construction of these curves is simple. Thus, taking the exposure at hole 15 as 1, that at hole 12 would be 2, at hole 9 as 4, and so on.

The diagrams are constructed from the following tables:—

TABLE I.

Hole No.	Curve I.	Curve II.	Curve III.	Hole No.	Curve I.	Curve II.	Curve III.
1	5.5	2.5	2.5	9	50	44	40
2	8	4.5	4.5	10	55.5	50	46
3	10.5	8	8	11	60	55.5	51
4	13.5	12	12	12	64.11	59	55
5	21	17.5	16	13	67	63	58
6	28	24	21	14	69	66	61
7	36	31	27	15	71	68	63.5
8	44	38	33				

TABLE II.

Exposure.	Curve I.	Curve II.	Curve III.	Exposure.	Curve I.	Curve II.	Curve III.
1	71	68	63.5	12	16.5	13.5	12
2	64	59	55	13	14.5	12	11
3	57	51.5	47	14	13	10	9.5
4	50	44	40	15	12	9	9
5	43.5	38	34.5	16	10.5	8	8
6	38	32.5	29	17	9.5	7	7
7	33	28	25	18	9	6.5	6.5
8	28	24	21	20	7.5	5.0	5.0
9	25	21	18	22	6.5	4.5	4.5
10	22	18	16	24	6	4	4
11	19	15.5	14	26	5	3.5	3.5

A comparison of these curves II and III shows that to obtain the same darkness in the most exposed parts, the exposure had to be prolonged to nearly double. The exact amount of course cannot be accurately stated, but that is approximately the case. From these curves we learn one thing, that the gradation is greater in the case of hot development than with cold. We may draw an example from this: at 18 on the scale the blackness contains about 11.5 of white, white being represented by 72.5; and most platinum prints, in their deepest shadows, rarely exceed this amount. Suppose we have two negatives of the same subject, the deepest shadows in both being transparent, but that one is weaker than the other. Let us suppose that the density of the highest light in one case is such as to allow only  $\frac{1}{16}$ th of the incident light to pass, and in the other  $\frac{1}{8}$ th; and let us suppose that the former (denser) negative was developed with a hot developer, and the latter with a cold developer.

Now  $\frac{1}{16}$ th of the exposure 18 which produces the deepest black is 1, and the whiteness is represented by  $\frac{63}{72.5}$  on curve III;  $\frac{1}{8}$ th of the exposure of 18 in the other case is 2, and has  $\frac{59}{72.5}$  of whiteness when measured on curve II. Had the development taken place by hot developer it would only have had a whiteness of  $\frac{55}{72.5}$ . Evidently, then, the cold developer, with

a weak negative, more nearly approximates to the gradation of the stronger negative when developed by the hot developer.

Turning to curve I, it is evident that the strength of developer seriously alters the blackness of the print when used cold; but, as before said, it was not found that when used hot the 65-grain developer altered the gradation. For some reason this is important. I have not had time to tabulate and work out many other interesting points in regard to the hot and cold development which I have carried out, and they must be reserved for some future occasion. What I have brought forward may be of some little use as a guide to what may be expected when the two modes of development are conducted side by side.

It must not be taken that these curves will always accurately represent the shades of platinum prints. The paper supplied varies from time to time in gradation; but the relative gradations of hot and cold development remain about the same.



## Notes.

The Pizzighelli process of direct platinotype printing is perhaps the most important novelty in connection with positive photographs which has been published during the past year, and it will be remembered that in the YEAR-Book for the current year we give full particulars for working this process and preparing the paper. Photographers generally like to purchase their printing paper ready made, and up to the present the Pizzighelli paper has not been obtainable, consequently the method has not been largely adopted in this country; but we are glad to hear that Hesekei and Jacoby, of Berlin, now make the paper in question, and the London Agent is C. A. Rudowsky, of 3, Guildhall Chambers, Basinghall Street, E.C.

We have received samples of the paper for trial, and find it excellent.

For the credit of photography, we hope that prints in platinum will soon largely replace the gelatino-bromide silver prints, now so largely sold, and so frequently seen in a faded state.

The following is a good example of the curious views taken by Fire Insurance Companies as to the risks of photographers. It is extracted from a "Technical Dictionary of Fire Insurance" lately published by W. A. Harris, of the Phoenix Fire Office. The book itself seems a practical one, but it is to be hoped that the information in other cases is more accurate.

"Photographers' risks are nearly always of hazardous description, owing to their flimsy construction, heating and lighting arrangements, speculative nature of the business, manufacture of chemicals (especially collodion, which is a solution of pyroxylin or gun-cotton in ether and alcohol), storage of methylated spirit and varnishes, and the comparatively valueless character of the majority of the negatives stored, or said to be stored. These negatives should not be insured at all unless a register be kept, and even then only a small limit (say from 1s. to 2s. 6d. on each) should be allowed. The character of the proposer, and the length of time in business, should be ascertained."

From the *St. Moritz Post*, a paper issued by the English residents of the Engadine, we learn that the mountaineer photographer, Vittorio Sella, has recently taken a series of views on Mount Etna, and in spite of the difficulties incident to the proper representation of black lava and white snow on the same plate, he has obtained some very fine results.

Topography and archaeology, so far as Cheshire is concerned, are to have the assistance of photography. The Birkenhead Amateur Photographic Society has taken the matter in hand, starting with the Wirral district, the locality of which is rich in antiquarian remains. A map has been prepared and divided into sections, and these

sections have been distributed among the members, who will proceed to hunt out and photograph all the interesting spots and buildings they can discover. The idea is a good one, as it systematises work which generally has a tendency to be desultory and incomplete. Now that the Society for Photographing Relics of Old London has abandoned its task, there is a good opportunity for amateurs in the metropolis to combine together and continue the work on a plan similar to that adopted by the Birkenhead Society.

The series of articles entitled "Charles Dickens and His Less Familiar Portraits," now appearing in the *Magazine*, illustrates very forcibly the difficulties which the interminable variations in the expressions of the face present to the artist. Here we have portraits of Dickens by Cruikshank, Maclise, D'Orsay, Ary Scheffer, Frith, and a miniature by Margaret Gillies. They are totally dissimilar, and these represent only a few of the portraits which were painted. To show how artists differ in their observation, it is interesting to note that in Ary Scheffer's portrait the eyes are brown, while in a portrait painted by Mr. Frith they are blue grey. To add to the confusion, T. A. Trollope asserts that Dickens's eyes were not blue, but of a very distinct and brilliant hazel.

The photographers, in their counterfeit presentment of Dickens, are equally at variance. The photograph by Mayall, taken about 1851, is not given, but that by Claudet, 1852, suggests J. L. Toole much more than the Dickens as rendered by the artist. Fradelle and Youg's photograph, taken in 1861, is, perhaps, the one that is most familiar to us. Naturally, the opinions of Dickens's friends as to the faithfulness of the various likenesses differed as much as the portraits themselves. Forster was enthusiastic over Maclise's portrait, but George Elliot infinitely preferred Mayall's photograph as "a satisfactory refutation of that keepsake, impossible face which Maclise gave him." Of Ary Scheffer's portrait, Dickens himself said, "It does not look to me at all like, nor does it strike me that if I saw it in a gallery I should suppose myself to be the original. . . . As a work of art I see in it spirit combined with perfect ease, and yet I don't see myself. So I come to the conclusion that I never do see myself."

Dickens here has hit the point. No one knows exactly how he or she looks, and the portrait and photograph invariably come as a surprise, and sometimes as a shock. This, combined with the differences of opinion among the friends of the sitter, makes the task of the photographer intensely difficult, and we fancy that many photographers have been driven to the excessive use of retouching, because they know very well that people never grumble if they are made better looking than they really are.

Much sensation was caused at the meeting of a Gold Mining Company held the other day in the City by the sudden production by a speaker of a large photograph. The point under discussion was whether there was much



or little water on the property (situated in the Transvaal), upon this resting whether gold would or would not be extracted. One section, desirous of selling the rights to an outside party, contended that there was little or no water; the opposite section, anxious that the Company itself should work the mine, urged that there was plenty. In proof of the absence of the precious fluid, a representative of the former section triumphantly produced a photograph which showed a thin stream dribbling between the rocks.

To his chagrin, the photograph was not at all convincing, and the Board, who were in favour of the Company working the mine, carried their resolution by an overwhelming majority. This must not, however, be considered as derogatory to the photograph, because, as a matter of fact, shareholders in gold mines generally make up their minds before they enter the room, and if they have decided they will have gold, or they won't have gold, not all the photographs in the world will influence them. It is often a question of "bulling" and "bearing," and perhaps it is just as well that photography should not be degraded by assisting the machinations of speculators.

A would-be author just back from Siberia was boasting of the large number of dry plates he had used *en route* with a view of securing illustrations for his volume. "Why, what with the dry-plates and the dry letter-press," exclaimed the brutally candid friend, to whom the aforesaid boasts were being made, "what uncommonly dry rot your book will be, to be sure!"

A correspondent assures us that an ingenious youth of the "chappie" or "Johnnie" genus, having noticed that a certain firm advertised "Opal Enlargements," actually sent off a letter to that firm asking the terms for increasing the size of the precious stones in question. Our correspondent does not state, however, the date of the Johnnie's application. May we assume it was April the first?

Perhaps few materials afford such a scope for the swindler as gold; the photographer often paying for double or treble the amount of metal really contained in the supposed 15-grain tubes; while just now the gold fever in Wales is arousing the cupidity of two classes: first, the owners of long-discarded mines; and secondly, that of investors who wish to gain by trick. The "salting" business seems to be going on actively, and in last week's *Financial World* we read of a find of auriferous gravel, which, when washed, yielded the precious metal in filings and in scrapings, which were, in some cases, one-eighth of an inch long. This is rather a clumsy way of salting, the most approved method among those who wish to sell "bogus" mines being to charge a gun with precipitated or spongy gold, and fire it into the crevices or against the rock. To use filings, scrapings, or clippings of gold coin is risky.

A rumour is afloat about an attempt to merge the Society of Arts into the shadowy vagueness of the proposed

Imperial Institute; and this seems rather strange when we consider that the constitution of the Society of Arts is so essentially non-political that its hall cannot be used for meetings having even a veil of politics covering them. The rumour refers to hints that it is the revenues of the Society of Arts which the Imperial Institute desires to possess. Here is the story as given by the *Pall Mall Gazette*:—"The Prince of Wales, we learn on excellent authority, has caused a hint to be given to the council to the effect that if the Society does not amalgamate with the Imperial Institute, he will withdraw his patronage as president of the Society. The Imperial Institute people want the large revenue which the Society derives from subscriptions, and in exchange offer rooms at the Imperial Institute in place of the Society's building in John Street. As this would necessitate the removal of the Society from its present central and useful position, to one where it would be most inconveniently situated, and would also involve eventually the absorption by the South Kensington octopus, the value of the Society as an independent and useful institution would be destroyed."

It seems difficult, however, to see how the Imperial Institute could really lay hands on the funds, as the continuance of subscriptions can only be ensured by a retention of the confidence of subscribers, and probably most who have compounded for life membership would insist on a return of a due proportion, if the Society of Arts ceases its characteristically useful work.

It must be remembered that the notable usefulness of the Society of Arts during the past few years has rather been due to the excellent judgment and activity of its secretary, H. Trueman Wood, than to the fact of the Prince of Wales allowing his official title to be printed in the list of councillors.

## PHOTOGRAPHY AND GEOLOGY.

BY PERCY KENDALL, OWEN'S COLLEGE, MANCHESTER.

THE applications of photography to geology are so numerous that it is no easy task to reduce to the compass of a single article a series of representative examples which shall indicate even broadly the advantages which geologists have secured from the advances of modern photography.

The principal applications may be conveniently considered under the two headings of field and laboratory studies. In the former division might be included almost all the gems of rural scenery which the amateur or professional photographers seek out and fix upon that retina which even if it omits to record colours, at least forgets no details of form or arrangement, for there is a meaning and a significance to the eye of the geologist in the contour and disposition of hill and valley, stream and lake, nay, even of flower and tree, which will be readily understood by readers of such books as Geikie's "Scenery of Scotland." Cliffs, too, have a scientific interest not inferior to their æsthetic attractions. Geologists have frequent need to obtain records as minute as possible of strata exposed in natural cuttings such as sea-cliffs and river gorges, but still more necessary do they find it to have faithful and detailed representations of phenomena which are of an essentially evanescent nature. Admirable illustrations of the importance of photography are furnished from the de-



partment of geology which deals with the phenomena of volcanoes. Sir William Hamilton in 1767 made a series of careful drawings of Vesuvius during the progress of the eruptions of that year, and geologists have almost constantly since that time made use of his sketches to illustrate the way in which volcanic cones are built up by the blowing out fine dust and fragments of half-fused rock; but great as was the value of these drawings, they still left much to be desired in the way of details, and for these details geologists are dependent entirely upon photography. Photographs have been obtained in recent years, which give an idea of an eruption of Vesuvius that drawings or verbal descriptions utterly fail to do. In a celebrated instantaneous view taken in 1872 we see the lower slopes of the mountain traversed by great steaming streams of lava, while the upper part of the cone is hidden in the huge clouds of steam and dust which rise to an altitude of 20,000 feet.

Palmieri says that in this eruption, so numerous were the rents through which flowed the molten rock within, that the great mountain "sweated fire." Photographic studies of the mode of progression of a lava stream have been made with striking success by some of the American State geologists under Captain Dalton in the island of Hawaii. From a suitable station they photographed an advancing stream repeatedly, at intervals of five minutes, and the pictures obtained will, it is to be hoped, dispel a good many false impressions from the minds of those whose experiences of vulcanology is limited to book-lore. As has already been said, our own country abounds in geological features which can be adequately depicted only by photography.

The writer has recently had occasion to obtain a photograph of an object discovered in a tunnel, and the picture was produced by means of the gun-cotton and magnesium flash-light in a most satisfactory manner. There can be but little doubt but that the geological exploration of caverns will be greatly facilitated by the use of that most valuable illuminant.

In the laboratory geologists have almost as many occasions for employing photography as they have specimens which they wish to figure or to write upon. Our fossils—be they shells or bones, plants or minute foraminifera—can, as a rule, be illustrated by the engraver far better if he have a photograph to guide him than without such aid; and the advantage of sending photographs to a specialist for the determination of the nature of rare or unique specimens, instead of entrusting the treasures themselves to the Postmaster-General, is sufficiently manifest to be recognised without the testimony of the writer from personal experience.

The microscopic study of rocks is receiving an amount of attention from geologists which appears to be quite disproportionate to its importance relatively to other branches of geological research; but, however that may be, the fact is indisputable that the camera is a most valuable accessory to the other appliances of the photographer.

Microscopic preparations of a complexity which defies the efforts of the artist to represent, can be readily photographed, and structures revealed by polarised light offer no insuperable obstacle.

It is usual to dispense with the camera-lens and the eyepiece of the microscope in photographing microscopic objects; but the writer has, after making experiments with that and the simpler method of using all the lenses, finally decided upon the latter, and whether employed for opaque or transparent preparations, has found it to yield excellent results. The use of the iris aperture-shutter is strongly to be recommended for all microscopic work of this kind. Where only a moderate degree of enlargement—2 to 5 diameters—is required, the use of the camera alone, with a wide-angled lens, has been found to be the quickest and best plan.

The foregoing is a very brief outline of what has been done in geology, but it appears probable that in the course

of a few years no geologist will feel fully equipped without his camera, and our geological student will receive instruction in photography as an indispensable preliminary to his taking to the field, hammer in hand, as an amateur stone-breaker.

## NOTES ON DEPTH OF FOCUS.

BY SIR DAVID SALOMONS, BART.\*

LET us define depth of focus thus:—The distance between two planes in space wherein all objects appear well defined on the focussing screen. Generally when a point in any object is represented by a circle of confusion having a diameter not exceeding  $\frac{1}{100}$ th of an inch, it is held that the definition of the image is sufficiently sharp. A flat field is presumed. The following formulæ are based on these suppositions, but any other hypotheses could be used, should it be desired, and the equations altered to suit. To avoid repetition and details, it will be best to refer to the Paper read before this Society on May 8th, 1883.

Let  $D$  = depth of focus,

$f$  = equivalent focus length,

$\Delta$  = distance of object from optical centre of lens,

$R$  = ratio or intensity.

Then it was shown that—

$$D = \frac{2(\Delta - f)}{\frac{100f^2 R}{\Delta} - \frac{\Delta}{100f^2 R}} \quad (I.)$$

The true focussing plane is not situated midway, but this does not affect the truth of this formula, or the results derived therefrom. If  $\Delta = nf$  where  $n$  is number, then—

$$D = \frac{2f(n-1)}{\frac{100fR}{n} - \frac{n}{100fR}} \quad (II.)$$

which is simpler to use in practice.

Again, if  $DS$  = decimal standard marked on the stop, then since—

$$R = \frac{1}{\sqrt{DS} \times 10},$$

$$D = \frac{2f(n-1)}{\frac{f}{n} \sqrt{\frac{1000}{DS}} - \frac{n}{f} \sqrt{\frac{DS}{1000}}} \quad (III.)$$

Or—

$$D = \frac{2f(n-1)}{\frac{10f}{n} \sqrt{\frac{10}{SD}} - \frac{n}{10f} \sqrt{\frac{DS}{10}}} \quad (IV.)$$

Again, since  $\frac{1}{\sqrt{DS} \times 10} = \frac{1}{\sqrt{DS} \sqrt{10}}$ , and  $\sqrt{10} =$

3.16 approximately, we have  $\frac{1}{\sqrt{DS} \sqrt{10}} = \frac{1}{3.16 \sqrt{DS}}$ .

By substituting this value in Equation IV, the following values for  $D$  are found:—

$$D = \frac{2f(n-1)}{\frac{100f}{3.16n \sqrt{DS}} - \frac{3.16n \sqrt{DS}}{100f}} \quad (V.)$$

$$D = \frac{2f(n-1)}{\frac{10f}{3.16n \sqrt{DS}} - \frac{3.16n \sqrt{DS}}{10f}} \quad (VI.)$$

$$D = \frac{2f(n-1)}{\frac{f}{3.16n \sqrt{DS}} - \frac{3.16n \sqrt{DS}}{f}} \quad (VII.)$$

$$D = \frac{2f(n-1)}{\frac{3.16f}{n \sqrt{DS}} - \frac{n \sqrt{DS}}{3.16f}} \quad (VIII.)$$

\* A Communication to the Photographic Society of Great Britain.



$$D = \frac{2f(n-1)}{10fC - \frac{n}{10fC}} \quad (\text{IX.})$$

$$\text{where } C = \sqrt{\frac{10}{DS}},$$

All the above equations will be found of service in practice. To assist in the solution of problems, the following square roots to two places of decimals are given, because the  $\sqrt{DS}$  is often required to solve the above equations. Only the general run of stop numbers are given:—

DS	$\sqrt{DS}$	DS	$\sqrt{DS}$	DS	$\sqrt{DS}$
8	2.82	14	3.74	20	4.47
9	3	15	3.87	22	4.69
10	3.16	16	4	25	5
12	3.46	18	4.24	30	5.47

Barlow's tables of squares and square roots are very useful in avoiding long calculations.

Before proceeding to the question of problems, let us analyse these equations. Take Equation II.—

$$D = \frac{2f(n-1)}{100fR - \frac{n}{100fR}}$$

It is clear that when  $n = 1$ ,  $D = 0$ . In other words, depth of focus cannot exist, because the rays are parallel after passing through the lens.

When copying equal size  $n f = 2 f$ .  $\therefore n = 2$ , and the equation becomes—

$$D = \frac{2f}{100fR - \frac{2}{100fR}} = \frac{2f}{50fR - \frac{1}{50fR}}$$

Or—

$$D = \frac{1}{25R - \frac{1}{100f^2R}}$$

Now  $\frac{1}{100f^2R}$  is usually very small, so we obtain the simple form of equation:—

$$D = \frac{1}{25R} = \frac{1}{25 \frac{1}{\sqrt{DS} \times 10}} = \frac{\sqrt{DS} \times 10}{25}$$

$$\therefore D = \frac{3.16}{25} \sqrt{DS} = .126 \sqrt{DS} \approx \frac{\sqrt{DS}}{8} \quad (\text{X.})$$

Again, when  $\frac{100fR}{n} = \frac{n}{100fR}$ ,  $D = \text{infinity}$ ; that is, after a certain distance all will be in focus.

Let us proceed to examine Equation VI.—

$$D = \frac{2f(n-1)}{316n\sqrt{DS} - \frac{316n\sqrt{DS}}{10f}}$$

When  $f$  is large,  $n$  small, and the stop marked by  $DS$  to any number generally employed—say up to 30—then  $\frac{316n\sqrt{DS}}{10f}$  becomes a very small fraction, and may be neglected for practical purposes, we then obtain—

$$D = .0632 n (n-1) \sqrt{DS}; \quad (\text{XI.})$$

$$DS = \frac{D^2}{[.0632 n (n-1)]^2}; \quad (\text{XII.})$$

$$n = \sqrt{\frac{D}{.0632 \sqrt{DS}} + \frac{1}{4}} + \frac{1}{2}; \quad (\text{XIII.})$$

$f$  is here eliminated, so its value cannot be found by this method of simplification; but Equation VI must be reduced in the usual way, giving—

$$f = \frac{A \sqrt{D}}{\sqrt{100D - 20An(n-1)}} \quad (\text{XIV.})$$

where  $A = .316 n \sqrt{DS}$ ,

and since  $\sqrt{DS}$ , and  $\sqrt{D}$  are known, the value for  $f$  is easily

obtained. This equation has one drawback, namely, that unless most exact values are inserted, the result found for  $f$  is very far from the truth, and therefore not convenient for practice.

However, there is no reason to use this formula at all, because photographers have a certain number of lenses by them, and they know beforehand the most suitable ones to employ in any given case. It is therefore only necessary to obtain, by trial with any of the above formulæ, which lens in their possession is the best to use. In fact, it is only the value of  $DS$ ,  $D$ , or  $n$  which is generally required to be found, and Equations XI, XII, and XIII are very simple expressions wherewith to find them. The reason why  $f$  disappears in these equations is due to the fact that their geometrical representations will be found to consist of sets of nearly similar triangles. Yet it must be remembered that  $f$  is not really eliminated if absolutely correct results are desired.

Before proceeding to the application of depth of focus formulæ, we will put some of the most useful equations into a more workable form.

The value of  $n$  as given above, is not the same as the value of  $n$  in the usual formulæ  $(n+1)f$ , and  $\left(\frac{1}{n} + 1\right)f$ , so we will arrange that  $n$  shall have the same value in all formulæ.

Now in the above equations  $\Delta = n'f$  and in the common formulæ  $\Delta = (n+1)f$ ,

$$\therefore n'f = (n+1)f;$$

hence—

$$n' = n + 1,$$

consequently we must put  $n+1$  for  $n$  throughout the given equations, in order that  $n$  may always have the same value.

Let us re-write Equations VI, X, XI, XII, and XIV, substituting  $n+1$  for  $n$ . We shall obtain the following:—

VI. becomes—

$$D = \frac{2nf}{\frac{10f}{.316(n+1)\sqrt{DS}} - \frac{.316(n+1)\sqrt{DS}}{10f}} = \frac{n}{A - \frac{A}{20f^2}}; \quad (a.)$$

X becomes—

$$D = .0632 n (n+1) \sqrt{DS} = .2 A n; \quad (b.)$$

XI. becomes—

$$D = \frac{D^2}{[.0632 n (n+1)]^2} = \frac{250 D^2}{[n (n+1)]^2}; \quad (c.)$$

XII. becomes—

$$n = \sqrt{\frac{D}{.0632 \sqrt{DS}} + \frac{1}{4}} + \frac{1}{2}; \quad (d.)$$

XIV. becomes—

$$f = \frac{A \sqrt{D}}{\sqrt{100D - 20An}}; \quad (e.)$$

and in this equation, that a possible value may exist,  $100D$  must be greater than  $20An$ . We have by X for copying equal—

$$D = .126 \sqrt{DS} \quad (g.)$$

When using equations  $b$ ,  $c$ , and  $d$ , it is always necessary to see whether—

$$\frac{.316(n+1)\sqrt{DS}}{10f} \left( = \frac{A}{10f} \right)$$

is so small that it may be neglected. The same remark applies to the fraction  $\frac{1}{100f^2R}$  when employing equation  $g$  (see solution of X).

We may now proceed to problems.

#### PROBLEM A.

With a 30" equivalent focus lens, it is desired to take a 3" head (9" being taken as life size), and 3" depth of focus is required. What stop should be used if marked on the decimal system?

Here  $n = 3$ , since  $\frac{1}{n}$  = the reduction, which is  $\frac{1}{3}$  in this case,  $f = 30''$  and  $D = 3''$ .

The fraction—

$$\frac{.316(n+1)\sqrt{DS}}{10f} = \frac{1.264 \sqrt{DS}}{10 \times 30} = .00421 \sqrt{DS};$$

evidently this is very small, so we may employ equation  $c$ —



$$\therefore D S = \frac{9}{(0.632 \times 3 \times 4)^2} = \frac{9}{7584^2}$$

$$\therefore D S = \frac{9}{57517056} = \frac{90}{6} \text{ approx.}$$

$$\therefore D S = 15 \text{ Answer}$$

## PROBLEM B.

The same data as in the last problem, but ascertain what depth of focus will be obtained with a stop marked 20 D S? Employ equation *b*. Hence—

$$D = 0.632 \times 3 \times 4 \sqrt{20} \text{ and } \sqrt{20} = 4.47$$

$$\therefore D = 7584 \times 4.47 = 339'' \text{ Answer.}$$

## PROBLEM C.

The same lens as in Problem A. What depth of focus if 20 D S stop is used, and a life-size head is taken. Here  $\frac{1}{100 f^2 R}$  is very small, so we may employ equation *g*. Hence—

$$D = 126 \sqrt{20} = 126 \times 4.47 = 5632.$$

$$\therefore D = \text{approx. } 6'' \text{ Answer.}$$

## PROBLEM D.

Equivalent focal length of lens employed is 24'', stop used is marked 18 D S. What size head can be taken if depth of focus is to be 4''? Here—

$$\frac{316(n+1)}{10f} \sqrt{D S} = \frac{316 \times 4.24(n+1)}{240} = 0.05565(n+1),$$

and since *n* will not be large, this fraction has a very small value. We may therefore employ equation *d*. Hence—

$$n = \sqrt{\frac{4}{0.632 \times 4.24} + \frac{1}{4}} - \frac{1}{2}$$

$$\therefore n = \sqrt{\frac{16 + 26797}{1.072}} - \frac{1}{2}$$

Let 26797 be taken as 27, and 1.072 as 1.1, then—

$$n = \sqrt{\frac{16.27}{1.1} - \frac{1}{2}} = \sqrt{14.8} = 3.8$$

$$\text{Now } \sqrt{14.8} = \text{approx. } 3.8,$$

$$\therefore n = 3.8 - 0.5 = 3.3.$$

Since the reduction is expressed by  $\frac{1}{n}$ , in this case it is  $\frac{1}{3.3}$  or

$$\frac{10}{33}, \text{ and the head being } 9'', \text{ the image will be } \left(\frac{10}{33} \times 9\right)'' =$$

$$\frac{90}{33} = \text{say } 2\frac{1}{4}'' \text{ Answer.}$$

## Patent Intelligence.

## Applications for Letters Patent.

9,851. THOMAS ECCLES, 156, Lenox Street, Lozells, Birmingham, for "A camera named 'The Condor.'"—July 6th, 1888.

## Specifications Published.

7,176. WILLIAM PHILLIPS THOMPSON, F.C.S., M.I.M.E., of the Agency for Foreign Patent Solicitors, 6, Lord Street, Liverpool, and 6, Bank Street, Manchester, both in the County of Lancaster, and 323, High Holborn, in the County of Middlesex, Civil Engineer, for "Improvements in combined diaphragms and shutters for photographic and other lenses."—Dated 15th May, 1888.

This invention relates to that class of devices which are used to vary the size of, and to open and close the opening through the lens tube, and which, in their common form, consist of a series of overlapping pivoted leaves grouped around the centre, and connected so as to swing inward and outward in unison.

The invention consists in an improved manner of constructing and uniting these leaves, and in improved devices for adjusting them when used as a diaphragm, and for operating them when used as a shutter.

In the present instance, the device is shown inserted permanently in the middle of a lens tube, this being the preferred arrangement, but it may be constructed independently for use in rear or in front of the lens.

In the accompanying drawings:—

Figure 1 is a perspective view of a lens provided with the device.

Figure 2 is a rear elevation of the device with a portion of the casing broken away to show the form and arrangement of the leaves.

Figure 3 is a vertical axial section through the same on the line *y y* of figure 2.

Figure 4 is a face view showing the leaves as they appear when partially opened for use as a diaphragm.

Figure 5 is a view of one of the leaves or sections detached.

Figures 6 and 7 are views illustrating the action of the devices for controlling the movement of the lips when used as a shutter.

Referring to the drawings.

A represents the tube or mounting of the lens of ordinary construction; and B, a ring inserted and secured in the tube midway of its length and projecting rigidly beyond the same as shown. This ring is grooved or recessed from the interior of the tube outward to receive the series of thin plates or leaves C, C', &c., of a curved form such as shown in figure 5. These leaves are grouped in a circular series around the axis of the tube, their adjacent edges being overlapped, and their outer ends inserted within the ring and mounted on fixed pivots *b*. Each leaf is provided with a stud or projection *c*, which extends through a curved slot *d* in the edge of the next leaf, this arrangement causing the leaves to swing inward or outward simultaneously and equally. When carried to their extreme limit of movement the plates overlap in such manner as to completely close the opening through the tube, and prevent the access of light to the lens proper. As they are turned outward they gradually separate at the inner edges, leaving between them a central opening of gradually increasing size in the manner illustrated in figure 4. The studs *c* are preferably provided with heads or enlargement to prevent withdrawal from the slots, and each slot enlarged at one end to permit the introduction of the head therethrough when assembling the parts. The leaf C at one end of the series has its pivot or journal extended through the ring or support to the outside, and there provided with a crank *l*, which is connected in turn by link *E* to a crank-pin *F*, adjustably secured in a radial slot in a rotary disk *G*. This disk is supported by a journal passing through a rigid arm *e*, formed on the ring *B*, or otherwise suitably supported.

The rotary disk *G* is recessed centrally in its back to receive a coiled spring *H*, one end of which is secured thereto, whilst the opposite end is secured to a sleeve *I*, loosely encircling the axis of the disk, and projected through the support *E*, its rear end being provided with an arm *i*, the rotation of which serves to increase or diminish the tension of the spring. The arm *i* is provided with a stud *i'*, and the support provided as in figure 2, with a series of holes to receive said stud, whereby the arm may be locked in different positions to maintain the required tension of the spring. The disk *G* is provided on its periphery near the rear edge with two studs *g* and *h*, and it is also provided at an intermediate point near the forward edge with a stud *j*. To the frame or other support below the disk is pivoted an angular lever or latch *J*, acted upon by a spring *l*, and adapted to engage the studs *h* and *j* successively, to check the rotation of the disk *G*. To this lever, below its fulcrum, is pivoted at *m* an angular dog *n*, held in place with sufficient friction to prevent its accidental movement. The motion of this dog upon its pivot is limited by a stud *o*. A piston *p*, acting beneath the free end of the latch-lever, is mounted in the upper end of a tube *q*, the opposite end of which is connected, as usual in this class of devices, by a flexible tube *r*, with a bulb or equivalent means for supplying air under pressure to lift the piston.

The recessed crank-pin *F*, before alluded to, is provided with a head sliding in the undercut slot in the disk *G*, and is provided on its outer threaded end with a nut *f*, by which it may be fixed in position at different distances from the centre, in order to vary the length of movement imparted to the link *E*.

The operation of the device is as follows:—

If it is to serve as a diaphragm, the disk is given, by means of its handle, a quarter revolution from its normal position, or until the slot stands in a vertical position. By this movement the link *E* is caused to open the leaves and provide a central aperture. The size of this aperture may be regulated by adjusting the wrist-pin to and from the centre, the device thus serving the purpose of the ordinary series of diaphragms. If now it be required to operate the device as an instantaneous shutter, the dog *n* is turned to the position shown in figure 7, and the disk *G* given a half revolution from its normal position, until it stands

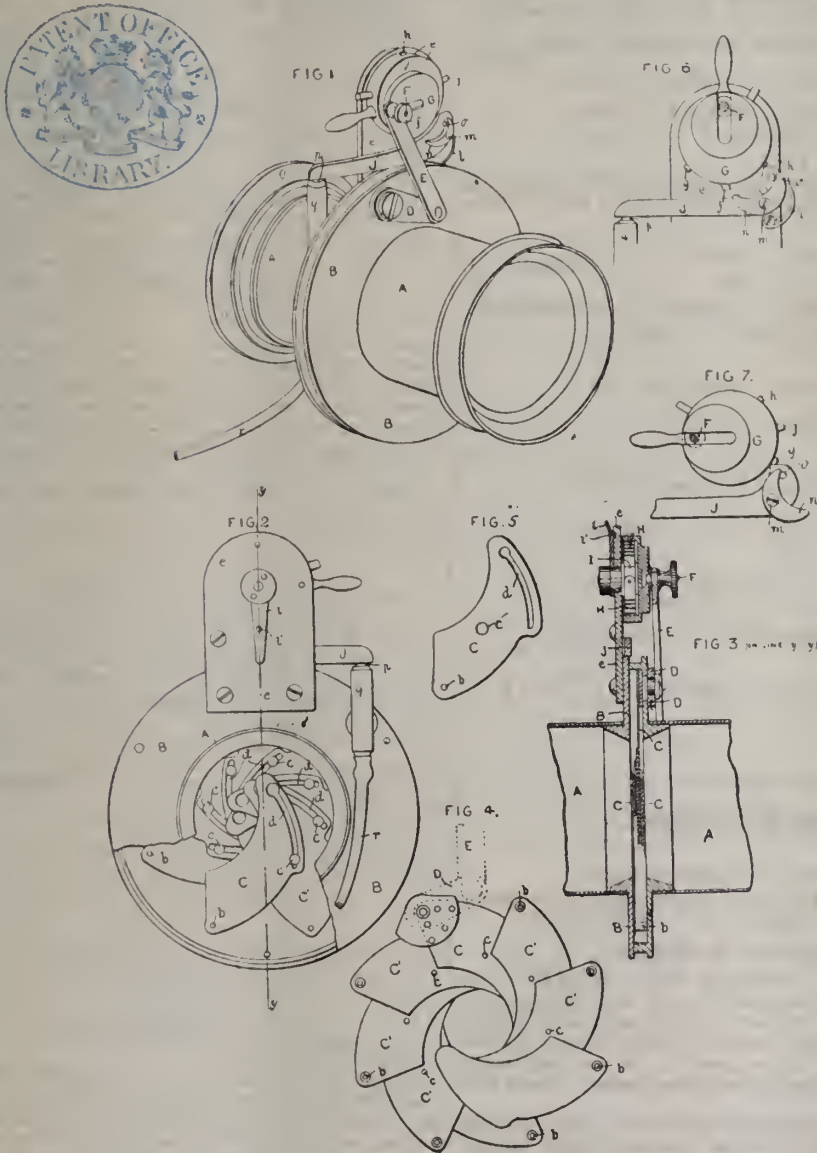


as shown in figure 1, in which position it is locked by the engagement of the lever J against the stud g as shown in figure 7. If now the bulb be compressed, the piston will cause the lever to disengage from the stud, whereupon the disk G will be suddenly given a half revolution by the spring, causing the shutter to open and instantly close again. If a time exposure be required, the dog is turned to the position shown in figure 6, and the shutter closed as before by turning the disk to the position shown in figure 1. When the devices are actuated, the disk will revolve until the stud j acts upon the end of the dog n, whereupon it will move the dog and with it the lever, until the disk engages the second stud h, as shown in figure 6, the effect of which will be to arrest the parts in position to hold the shutter

open. A second impulse of air will cause the dog to disengage from the stud h and permit the disk to continue its revolution until the shutter is closed.

In some cases the slots may be omitted, and the stud C on each leaf arranged to slide against the inner edge of the next leaf. In this case the crank will serve the purpose simply of communicating motion through the studs to the successive leaves to effect their outward movement, and a spring must be applied to the terminal leaf in the series to effect the inward movement, the leaves being opened and held open against the stress of this spring. The slotted connection is preferred, as it ensures the positive motion of the leaves in both directions.

A series of pivoted leaves grouped around the axis of a lens



tube have already been connected by intermediate links, and by means of a revolving ring, but these intermediate connections have not hitherto been dispensed with, nor has each leaf been provided with a stud acting directly upon the next leaf.

Having now particularly described and ascertained the nature of the said invention, and in what manner the same is to be performed, as communicated to me by my foreign correspondent, I declare that what I claim is:—

1. The series of pivoted leaves grouped around a central point, and each provided with a stud engaging and imparting motion to the next leaf, substantially as described.

2. A series of pivoted leaves grouped around a central point, each leaf provided with a stud passing through a slot in the next leaf, the series of leaves or plates pivoted and connected as described, in combination with a crank arm D, the revolving disc, its crank-pin, the connection from the crank-pin to the crank D, the actuating spring, and a detent, substantially as described.

3. In combination with the spring-actuated disc or drum G, connected to and operating the leaves of the shutter, the lever or detent J, and the dog n mounted thereon: whereby the device may be adapted for instantaneous or time exposures at will.



4. The pivoted connected leaves and their operating crank D, in combination with the revolving disc or drum, its actuating spring, the detent to arrest its motion, the radially adjustable crank pin F, and connection therefrom to the crank D, whereby the opening and closing movement of the leaves may be varied at will.

5,055. ALFRED HART, of 16, Upper Bedford Street, Brighton, in the County of Sussex, Photographer, for "Improved processes for contact printing and obtaining reliefs in photography, and means or apparatus to be employed in such processes."—Dated April 5th, 1888.

In carrying out this said invention I proceed as follows:—I make a dry plate for contact printing with a bromide or other suitable emulsion, which I coat in the ordinary manner. The mediums I employ in the place of glass or paper are, celluloid, vulcanite india-rubber, and a material manufactured under the name of "Everclean," and the like.

The advantages of these compositions and materials are their durability and non-liability to breakage, and the control I hold over them in giving them any desired tint, which I can do in any shade or colour, and by giving them a finishing coat of the same materials in a liquid and transparent state, render them thoroughly impervious to air and water.

This forms part of my invention, or I can, by the aid of the above-mentioned compositions and materials, produce a photograph in relief in the following manner:—

I make a series of perforated plates, each perforation representing different parts of the picture where relief is desired. In doing this I employ an iron box one inch in height, more or less, as required, on the inside bottom of which is an india-rubber cushion half an inch in thickness and the exact size of the picture to be embossed. The print being laid face uppermost on the india-rubber cushion, the plates being laid over it alternately, an iron plate one inch in thickness is placed over the perforated plate, a part of which protrudes from the top of the iron box; this being placed in an hydraulic or other press, the india-rubber is forced into the perforated parts of the plate, thus giving the desired relief; I continue to change the plates until all the parts requiring relief are obtained. To enable me to carry out this part of the process I use celluloid, vulcanite, india-rubber, and a material manufactured under the name of Everclean, and the like, as the means of withstanding the pressure necessary to produce such relief.

The indent at the back of the picture produced by the pressure is filled with a suitable cement, which protects them from all injury that might be caused by undue pressure.

Having now described the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is—

1st. The process of producing an embossed photograph, by the aid of perforated plates and the use of the aforesaid flexible compositions for the production of the same; and furthermore—

2nd. For making dry plates for contact printing from the same.

#### Patents Granted in America.

384,416. WILLIAM BELL, Philadelphia, Pa, for "Apparatus for heating, cooling, ventilating, and drying photographic plates." Filed May 10th, 1887. Serial No. 237,687. (No model.)

*Claim.*—1. A photographic heating and cooling apparatus consisting of a chest with shelves for drying the coated plates, in combination with a refrigerating chamber, substantially as and for the purpose set forth.

2. A photographic heating and cooling apparatus consisting of an adjustable chest with shelves for drying the coated plates, in combination with a refrigerating-chamber at one side and a heating device on another side therefor, substantially as and for the purpose set forth.

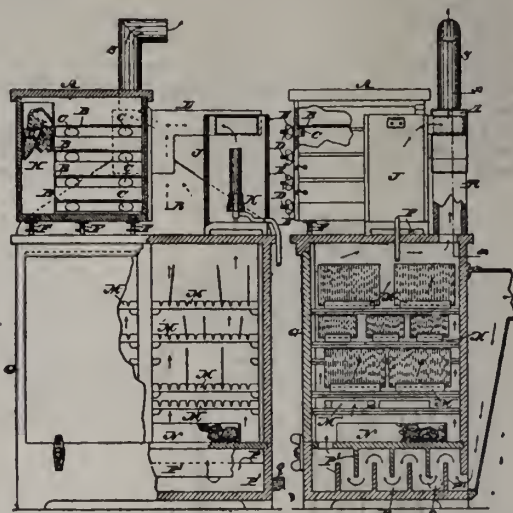
3. A chest containing shelves and screws having adjusting-heads C, on which said shelves are rested, substantially as described.

4. A chest provided with levelling screws and containing plate-supporting shelves with adjusting-screws, substantially as described.

5. A chest with plate-supporting shelves, a storage-chest, with a heating device and exit-flue connected with the storage-chest, combined and operating substantially as described.

6. A photographic heating and cooling apparatus consisting of the chest G, in combination with the chest A thereon and provided with shelves, the heating-chest J, and the flue R, that

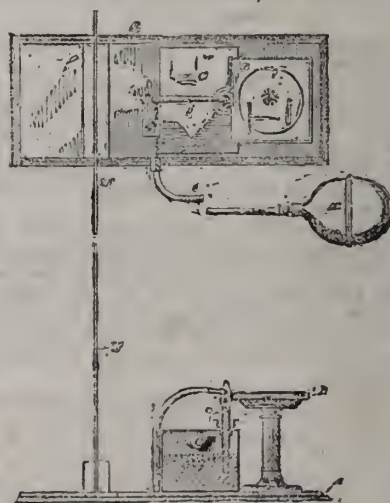
portion of the top of said chest G not occupied by the said chests A and J and flue R being flat, substantially as and for the purpose set forth.



7. A photographic heating and cooling apparatus having a plate-receiving chamber with a heating-chamber having zigzag passages, and a flue with horizontal projections alternately secured to the inner wall thereof, substantially as described.

384,636. THOMAS H. MCCOLIN, Philadelphia, Pa., for "Photographic flash-light apparatus."—Filed Feb. 29th, 1888. Serial No. 265,743. (No model.)

*Claim.*—1. A photographic flash-light apparatus consisting of a holder for flashing material, a lamp, an air-tube, and a pumping device connected to said air-tube, the burner of said lamp



being located between said holder and air-tube, said parts being combined substantially as and for the purpose set forth.

2. In a flash-light apparatus, the combination, with a receptacle for containing ignitable material, and a lamp or burner, of a pneumatic tube having its nozzle arranged above the burner and adjacent to the material, whereby the air in said tube is heated to a high degree, and directed with the flame to the material, thus instantly igniting the same, substantially as described.

384,754. FRED. A. GARISON, Fort Dodge, Iowa, for "Photographic cabinet."—Filed Feb. 9th, 1888. Serial No. 263,487. (No model.)

*Claim.*—1. In a photograph-exhibiting cabinet, the roller C, mounted in a suitable case near its top, the roller D mounted therein near the bottom and having a pulley F, the shaft G mounted in the case and provided with a handle or crank I on its outer end, and a pulley H on its inner end, the belt K,



mounted on the pulleys F and H, and the belt E mounted on the rollers C and D, and having the holders for the photographs attached thereto, substantially as and for the purpose specified.

2. In a photograph-exhibiting cabinet, the combination, with the endless belt E, of the holders comprising the standard M, attached at its inner end to the belt, and having clips on its outer end, and the lateral arms on the said standard having clips on their ends, all constructed and arranged substantially as specified.

3. In a photograph exhibitor, the combination, with the belt E, of the holders attached at intervals thereto, and comprising the rigid arms N, N', and O, having clips on their ends, and the arm



O', having an extension provided with clips, substantially as and for the purpose specified.

4. In a photograph-exhibitor, the combination with an endless belt of the holders comprising the arm N, having apertured ears P P on its free end adapted to be secured to the belt, and the hook-shaped clips between the ears, and the arms N' and O, having hook-shaped clips on their outer ends, and the arm O' provided with an extension having clips on its ends, substantially as specified.

5. In a photograph exhibitor, the combination with the endless belt of the holder L attached thereto, and having the arms N N', and O, provided with hook-shaped clips at their ends, the arm O' having guide-clips o' on its end, and the extension-arm Q operating in the said guide-clips, and having the clips q on its outer end similar to the clips on the arms N, N', and O, and the guide-clips o' o' on its inner end embracing the arm O, substantially as specified.

6. As a new article of manufacture, the holder comprising the arms N N', having clips n n' on their ends, the lateral arm O, having the clips o on its outer end, the arm O', and the extension-arm Q mounted on the arm O', and having clips q on its outer end, the said extension-arm being adapted to be extended to engage a card or photograph in the said clips on the ends of the arms, substantially as specified.

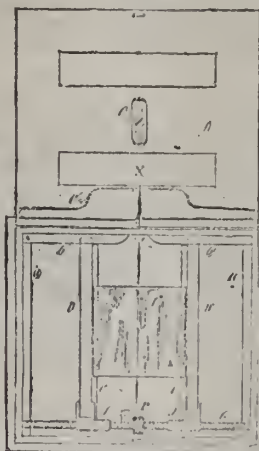
384,927. HENRY G. PIFFARD, New York, N. Y., for "Photogenic powder."—Filed Jan. 21, 1888. Serial No. 261,523. (No specimens.)

*Claim.*—As a new article of manufacture, an improved photogenic powder consisting of magnesium powder intimately mixed with wood powder of any similar nitro-lignin equivalent, substantially as and for the purpose specified.

384,835. MATTHIAS FLAMMANG, Newark, N. J., assignor to The Scovill Manufacturing Company, New York, N. Y., for "Photographic-plate holder."—Filed September 23rd, 1886. Serial No. 214,323. (No model.)

*Claim.*—1. In a photographic-plate holder, the combination with a frame of moveable jaws, a right-hand screw, a left-hand screw, a hand-piece between said screws for rotating the same, and nuts on the moveable jaws having elongated bearings on the screws, substantially as and for the purpose specified.

2. In a photographic-plate holder, the combination with a frame of moveable jaws, a right-hand screw, a left-hand screw,

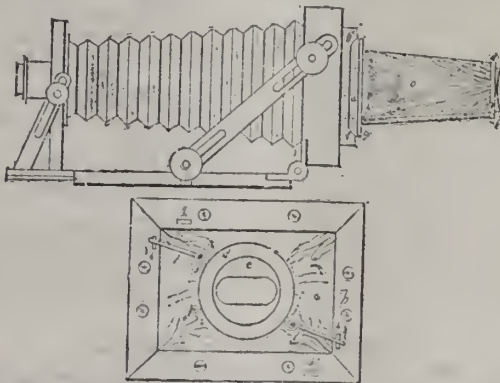


a bearing between said screws, a hand-piece, also between said screws, and nuts on the moveable jaws having elongated bearings on the screws, substantially as and for the purpose specified.

384,940. HADWEN SWAIN, San Francisco, Cal., for "Photographic camera."—Filed March 10th, 1888. Serial No. 266,907. (No model.)

*Claim.*—1. The camera provided with the bellows and lens, in combination with the cloth tube c and an adjustable eye-piece provided with the elongated opening secured thereto, substantially as and for the purpose set forth.

2. The camera provided with the bellows and lens, in combination with the cloth tube c, having the ring d connected thereto, and the adjustable eye-piece provided with the elongated opening mounted in the ring, substantially as described.



3. The combination, with the camera provided with the bellows and lens, of the cloth tube c, having the ring d, and the stretching-rods f f, secured to the main camera-box, and adapted to engage eyes in the ring d, substantially as and for the purpose set forth.

4. A cloth tube c, in combination with main frame a, stretching-rods f f, ring d, and eyepiece e, substantially as described.

385,297. ISIDOR COHN, New York, N. Y., assignor to Rebecca Cohn, same place, for "Photographic sheet."—Filed Jan. 21, 1888. Serial No. 281,522. (No specimens.)

*Claim.*—1. As a new manufacture, paper coated with gelatine, shellac, and lamp-black, and japanned, substantially as set forth.

2. As a new manufacture, paper coated with shellac and lamp black, and japanned, substantially as set forth.

3. The process herein described, consisting in first coating paper with a solution of gelatine, then drying the gelatine, then applying the coating of shellac and lamp-black, then japanning the resulting product and baking or drying the japan, substantially as described.

5. The process herein described, consisting in coating paper with shellac and lamp-black, then japanning the same and baking or drying the japan, substantially as set forth.



## Proceedings of Societies.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The ordinary weekly meeting was held on the 12th inst., W. H. PRESTWICH in the chair.

In reply to a question as to the best way of making developing or sensitising dishes,

F. A. BRIDGE said when glass and wood were the materials employed, common putty could be used, with which a little white lead had been mixed. The putty should be pressed in the grooves of the wood in which the glass was placed, a thin strip of wood being then pressed into the groove to force as much as possible of the putty out. A coating of shellac varnish afterwards was all that would be necessary. He had made dishes simply of wood, and pitched them inside; or, easier still, the dishes might be painted with common tar thinned with ordinary naphtha to the consistency of paint. It could be applied with an ordinary paint brush. The naphtha would evaporate, and the next day the coating of tar would be perfectly hard. He had used this mixture of tar and naphtha for outside work, and it answered admirably.

The CHAIRMAN, having occasion to repair the roof of his studio, used tar and linseed oil.

E. CLIFTON said home-made dishes were easily constructed of wood; some sheets of paper were then pasted inside, and the dish coated with paraffin wax.

Replying to several questions on the subject,

F. A. BRIDGE said the tar would only take up a certain quantity of the naphtha, which was procurable at any oil shop, and was very cheap. The tar worked as easily as black paint, and could be put on equally as flat; he could recommend it for any outside work.

W. J. SIMPSON exhibited a portable changing tent; this was a bag of black twill, lined with yellow fabric, extended by cross-pieces of wood on either side and at the bottom, these cross-pieces folding together when not in use; two sleeve holes at the side admitted the hands, the head being inserted through an aperture on the top.

A. HADDON said one of the questions from the box, at the previous meeting, asked for the best method of preparing chlorophyll, in reference to its application to gelatine plates, for the purpose of rendering them isochromatic. Thinking some of the members might be interested in the appearance of the spectrum of this colouring in different states of concentration, he had, during the week, prepared some chlorophyll. The chlorophyll he exhibited was made by macerating pear leaves in absolute alcohol raised to nearly boiling point, and then filtering. No attempt had been made to get rid of wax and other impurities, as these would in no way interfere with the appearance of the spectrum. Chlorophyll is usually said to be green; it would, however, be seen that the colour depended entirely upon the degree of concentration. When diluted it is green by transmitted light, but as the concentration is increased the solution gradually changes from green to red, both by transmitted and reflected light. The spectrum of a dilute solution is characterised by a powerful black band in the red, and a faint one in the green, a large portion of the blue being cut off. By increasing the volume of the fluid to a certain thickness, another absorption band appears in the orange, and the green band becomes more marked. Increasing the thickness still further until it appears red to the unaided eye, the spectrum will consist simply of a red and two green bands, all the other colours being stopped by the solution; glass tubes, varying in diameter, were then filled with the chlorophyll and handed round for view with a spectroscope. The speaker, continuing, drew attention to the mistake made by many, when describing new experiments, in not giving sufficient data. Mr. Ives, for instance, in his papers on the preparation of isochromatic plates, using chlorophyll as the colouring matter, states that he uses the leaves of the blue myrtle; he does not state, however, how the chlorophyll was prepared from these leaves, or whether he made any attempt to get rid of the wax and other impurities which would naturally be present if the macerated leaves were simply treated with alcoholic ether. The age of the leaves would also make a difference. In the young leaf yellow predominates, which turns to blue as the leaf gets older; the depth of the colour, therefore, being materially influenced by the age of the leaf.

W. Wiuter, J. Belding, and E. Miles were elected members of the Association.

### NORTH MIDDLESEX PHOTOGRAPHIC CLUB.

A MEETING was held on the 16th, at the Iron Room, Stroud Green, when E. TRAILL HISCOCK read a paper on "Lantern Slide Making," demonstrating it with four exposures. At first thought, he said, one was apt to imagine that just now his subject was rather out of time and keeping; but on again considering for a minute it was manifest that now was the best time, as a good negative could now be obtained, and to those who would amuse themselves and others in the winter he was sure there would not be a more interesting branch of photography. Having given a few useful hints on the selection of pictures, focussing, &c., Mr. Hiscock proceeded to expose four of Fry's bromide lantern plates, which he developed respectively with (1) ferrous oxalate, (2) Beach's potash developer, (3) pyro and ammonia, and (4) pyro and soda. The resulting pictures were in every case perfect; preference, however, being expressed for pyro and soda. He then exhibited some slides through the lantern, which were, indeed, most creditable productions.

On Bank Holiday the Club goes to Godalming, and visitors are invited. Full particulars will be announced on July 30th, or can be obtained of the Hon. Secretary, Ernest F. C. Damant, 25, Granville Road, Stroud Green.

The next outing will be to Hadley Woods, the 21st, the members meeting at Finsbury Park Station a little before half-past three.

## Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The next technical meeting will be held on Tuesday next, July 24th, at 8 p.m., at the Gallery, 5A, Pall Mall East.

PHOTOGRAPHIC CLUB.—The subject for discussion on July 25 will be "Dark Room Arrangements." Saturday outing from Duke of St. Albans, Highgate, across the fields to Bull and Bush, Hampstead.

## To Correspondents.

\*. Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER AND CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

CHARLES WARNER.—It is merely a lie of the commercialist—certainly a trifle more barfaced than ordinary—is several prices of apparatus have been meddled by the society referred to. To the person knowing, it is a clear indication as to the desirability or otherwise of having dealings with such a firm.

NITRATE.—As it is so easily soluble in water there is no difficulty; but remember that the lowering of temperature which takes place when it is dissolved, serves to lower the solvent powers of the water.

CARDBOARD.—Ordinarily, paste prepared with rye flour and alum is used; often with the addition of a little glue or size.

C. F. W.—The fact of the review having been written by the author himself, explains it; but the arrangement is not a usual one with reputable publications.

PRINTER.—Rather more than in this country—perhaps fifteen or twenty per cent. more.

L. C. B.—You have made a mistake which not a few have made before you: chlorate of potassium is the oxygen yielding salt, not chloride of potassium.

M. C.—When you have had more experience, you will know that a far more prolonged washing is necessary.

GEO. W. PHILLIPS.—1. You merely select such as show no very great opacity when rubbed on a piece of glass. As example of this, we may mention madder lake, prussian blue, yellow lake, and zinc white. 2. We do not think the instrument would perform satisfactorily if altered as you propose.

J. W. G. O.—We do not think that the new form of film is ready yet.

NOVARIAN.—Perhaps 30% as a commencement.

J. P. C.—There is no book on the subject now in print.

E. K.—The apothecaries drachm of 60 grains.

A. M. L.—Use boiled water for making the solution, and clean the glass with soda.

T. B.—The prints are imperfectly fixed. Leave them longer in the hyposulphite solution, and take care not to use the solution while abnormally cold from the recent dissolving of the hyposulphite. Some papers are so hard and compact as to require extra time in fixing.

T. PACEY.—The principal firm is Monckhoven, of Ghent.





# THE PHOTOGRAPHIC NEWS.

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### PHOTOGRAPHY WITHOUT A LENS.

AN article, which appeared in the columns of the PHOTOGRAPHIC NEWS of May 18th last, on the subject of photography without a lens, and having reference particularly to some recent developments of the question as expounded by Capt. Colson, has procured for us some very interesting examples of this method, which have been forwarded by Dr. John Vansant, of the United States Marine Hospital, at St. Louis, Missouri. Some of these examples we reproduced in our impression of July 13th, and we think it will be admitted that one at least of the photographs—the large one of the Hospital grounds, appearing on page 445—is, when allowance has been made for the loss of quality involved in reproduction by a block process adapted for printing along with type by machine, sufficiently remarkable to warrant further attention and discussion being given to a system which has received but little consideration in this country.

We note that Dr. Vansant calls the system of Photography without a Lens—which, for the want of a better title, generally goes by the name of pinhole photography—"Diffraction Photography," and the plate with the hole in it he calls a "diffractor." We cannot consider this selection of name a happy one. The photograph is not produced by diffraction, which, in so far as it comes into action at all, is merely a disturbing element. With regard to this disturbing element, however, it will be evident how completely photographers may disregard it when considering whether very small stops may be employed when using lenses without interference from diffraction, as we now have had many practical illustrations in the form of pinhole photographs, in which the aperture that has been used is much smaller than is likely to be contemplated with a lens, and in which there is yet no evidence of any mischief arising from diffraction.

From what has been said, it will be understood that in using the word "diffraction" for the aperture, we are quoting Dr. Vansant, and are not responsible for its employment in this connection.

It seems rather surprising that two experimentalists, who have both produced such excellent results, should be so diametrically at issue as to the principles upon which depend the achievement of the highest class of photography of which the pinhole system is capable. Captain Colson has formulated a law to the effect that the square of the diameter of the opening, which gives the best results as regards definition, bears a relation to the distance of the opening from the sensitive plate (commonly called the focal length) of 0.00081 to 1. Dr. Vansant thinks that "Capt. Colson's supposed law—that there is with each distance of aperture from plate a certain size of opening, with which the maximum sharpness obtainable without a lens is produced—is entirely erroneous, and without foundation in fact."

Dr. Vansant's view, put forth in opposition to that of Capt. Colson, is that "the only thing that controls the sharpness of the image is the diameter (and kind of edges, of course) of the diffractor, and the same diameter is equally effective at one distance as at another for this purpose, provided the illumination of the object and the sensitiveness of the film are sufficient. The smaller the aperture, the sharper the image at any distance."

It is to be presumed, however, that Dr. Vansant does not mean to be taken quite literally in saying that the smaller the aperture the sharper the image at any distance, but that he would limit this statement to apertures having a diameter of five hundredth of an inch and larger, seeing that this size, the five hundredth of an inch, is the smallest which he mentions as having given satisfactory results. He refers to perfect negatives that he made with openings of this diameter (0.02 of an inch), adding that the minuteness of such an aperture must be seen to be realized, being smaller than the cross section of the smallest hair. The largest sized aperture for any distance that Dr. Vansant admits under any circumstances is one of seventeen thousandths of an inch, but in practice does not exceed the diameter of fifteen thousandths, or about the sixty-sixth of an inch; whereas Capt. Colson gives the twenty-fifth of an inch as the proper size for a distance corresponding to a focus of 50 inches, and longer distances would require larger apertures still.

A circular aperture is that which has always been recommended, and certainly this is the form which would naturally be adopted, and from which the greatest sharpness would be expected. Dr. Vansant, however, describes both round and square openings, the latter obtained by placing two plates of foil each having a narrow slit, in contact, the slits being at right angles to each other; the opening is then of course square, and he does not exhibit any preference for the circular opening over the rectangular one thus formed. A suggestion that may prove of more value is that which he gives to expose the plate in which the orifice is formed to the action of sulphuretted hydrogen, in order to blacken it and prevent reflection from the edges of the orifice.

To arrive at a basis for the time of exposure required, Dr. Vansant took a square opening of twenty-one thousandths of an inch, placed at a distance of one inch from the sensitive plate. This required, for a well-lighted view in his own locality, an exposure of one second. When reckoning ordinary exposures required here, we used in our article on Capt. Colson's researches a somewhat different basis. We have found in our own practice, when photographing a well-lighted subject including a house and garden near London, using a good commercial plate, but one for which extra rapidity was not claimed, that with a diaphragm No. 100 on the universal system, an exposure of two seconds was right. This gives one-fiftieth



of a second as the exposure for unity or  $\frac{1}{4}$ , the base of the system. A plate of double the rapidity of the one referred to would be considered as extra sensitive, and would require for the same subject an exposure of one second for the stop marked one hundred, or the one-hundredth of a second for unity. All such calculations must of course be subject to variations for differences of plates, of light, of subject, and even of developers; but they are, nevertheless, useful as substituting a reasonable basis for work, instead of proceeding merely by guesswork. Starting, then, from this basis, we calculated that with an aperture of one-hundredth of an inch placed at a distance of four inches from the plate—the best aperture for that distance as stated by Captain Colson—using a highly-sensitive plate on a well-lighted subject, an exposure of about sixteen seconds would be required. Dr. Vansant's results would indicate a proportionate rapidity about twice as great. This difference is, of course, not more than would be expected to arise from difference of climate, or even of subject, and speed of plate. With plates of more recent make and more exalted rapidity, Dr. Vansant calculates for a basis of still less proportionate exposure.

The definition of Dr. Vansant's pictures is very good. He speaks, moreover, of having obtained negatives with well-defined lines measuring under the microscope only the one five-hundredth of an inch. This fineness of definition does not imply that the circle of confusion is no larger than that amount. The circle of confusion itself, it has been somewhat arbitrarily stated, may be, according to some writers, the one-tenth of a millimetre, or about the one two-hundred and fiftieth of an inch in diameter; whilst others, notably Captain Abney, put the figure at the one-hundredth of an inch, the difference depending probably upon whether the writers prefer to take the inch or the metre as the basis to be divided by some power of the fetish number 10. Whatever the size of the aperture, the diameter of the circle of confusion cannot be less than that size. With distant objects the circle of confusion will not be appreciably larger than the aperture, except as diffraction may step in to increase it. Dr. Vansant does not appear to be afraid of diffraction, however minute his aperture, and at any distance. Captain Colson, on the other hand, by giving the sizes which his experiments indicate as yielding the best results for different distances, leaves us to infer that with smaller apertures than those he directs, there would be loss by diffraction.

We are still of opinion that the most useful results will be found in large direct photographs of those subjects for which the length of exposure is not objectionable, and we hope that some of those who have the opportunity which light, subject, and appliances afford for working in this direction, will bring the question of comparatively large apertures for long so-called focal distances, as recommended by Captain Colson, and of small apertures for the same distances as advised by Dr. Vansant, to the test of direct experiment, and will favour us with the results of their experience.

#### ON THE PHOTOGRAPHS OF LIGHTNING FLASHES RECEIVED BY THE ROYAL METEOROLOGICAL SOCIETY.

BY THE HON. RALPH ABERCROMBY.\*

In the month of June 1887, the Committee issued about 200 circulars to the Secretaries of Photographic Societies in various parts of Europe and America, and also to other likely persons, requesting them to furnish the Royal Meteorological Society with photographs of lightning flashes.

About 60 photographs of lightning flashes were received in answer to this invitation; and these were exhibited at the meeting of the Society in March 1888, where they received much attention.

From the evidence now obtained, it is evident that lightning assumes various typical forms, under conditions which are at present unknown.

The following appear to be some of the most typical forms of lightning flashes:—

1. *Stream Lightning*, or a plain, broad, rather smooth streak of light.—Only two or three specimens of this form have been received. The Committee are disposed to consider this a distinct type of a single stream-like character, without distinct irregularities or branches, and not merely the result of bad focussing, because, as in the illustration here given, other objects—such as the trees—are extremely sharp. An example is given from a photograph taken by Mr. L. S. Clarke, Pittsburg, Pennsylvania, April 1886.



1.—Stream.

2. *Sinuuous Lightning*, when the flash keeps in some one general direction, but the line is sinuous, bending from side to side in a very irregular manner. This is by far the commonest type.

It is very noticeable that the thickness of the line varies during the course of discharge. Sometimes the thinnest part of the white streak is the highest, and the flash appears to get thicker as it approaches the earth; at other times a flash in the air begins thin, broadens out in the middle, and fines away again at the further extremity.

The Committee can offer no explanation of this at present, but they would call attention to the fact that in some photographs of electric sparks taken from an induction coil, those of high tension are thinner than those of low tension.

An excellent example of this sinuous type is given in No. 4,



4.—Sinuous.

from a photograph taken by Mr. L. S. Clarke, from the top of the Alleghany Mountains, on August 2nd, 1887.

3. *Ramified Lightning*, in which part of the flash appears to branch off from the main streak like the fibres from the root of a tree. Of course there is no evidence as to whether these fibres branch off from or run into the main flash.

A beautiful illustration is given in No. 2 from a photograph by Mr. E. S. Shepherd, in London, at 9 p.m. on August 17th, 1887.

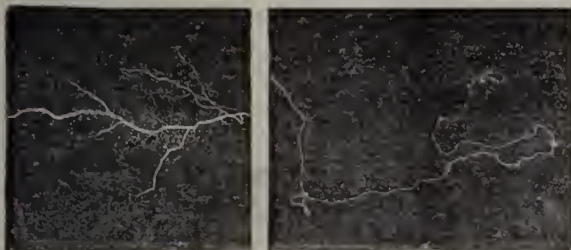
4. *Meandering Lightning*.—Sometimes the flash appears to meander about in the air without any definite course, and forms small, irregular loops. The thickness of the same flash may vary considerably in different parts of the course, as above mentioned;

\* From the *Quarterly Journal of the Meteorological Society*.



and a flash may go pretty straight in one portion of its path, but meander considerably in another.

An example is given in No. 3 from a photograph by Mr. J. Gray, at Brixton, at 9 p.m. on August 17th, 1887. This is the same



2.—Ramified.

3.—Meandering.

storm as that which produced the ramified flash shown in No. 2, and one of the fibres of that flash is curiously meandering.

5. *Beaded or Chapletted Lightning.*—Sometimes a series of bright beads appear in the general white streak of lightning on the photographic plate. Occasionally, these brighter spots appear to coincide with bends in a meandering type; but often the beads appear without any evident looping of the flash.

But as a flash is moving in space, while two directions only can be shown on the plane of the paper, there is every reason to believe that the brighter spots on the positive picture may be points where the flash was zig-zagging, either directly towards, or away from the observer, and thereby giving a somewhat longer exposure to these spots.

It may be remarked that the photograph of the spark derived from a large influence machine by Mr. Wimshurst and engraved in *Engineering* for April 27th, 1888, p. 420, shows distinct beading in places. This is reproduced in fig. 1a, through the courtesy of the publisher of *Engineering*.

6. *Ribbon Lightning.*—Nearly one-sixth of the photographs

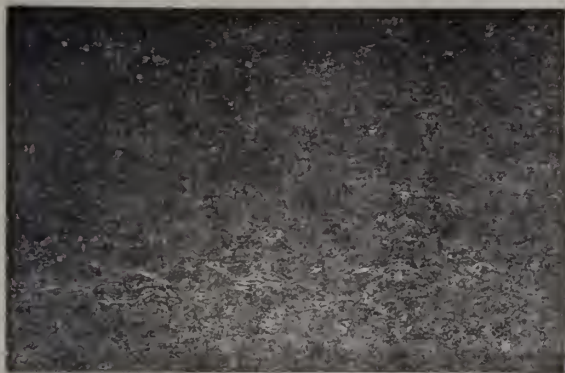


FIG. 1A.—Discharge from large electrical influence machine, by Mr Wimshurst, showing bright beads in the streaks of light.

received by the Society show flashes exhibiting more or less of a ribbon-like form. One edge of the ribbon is usually much whiter and firmer than the other.

Occasionally in the same picture, some flashes appear normal, and others ribboned; but the flashes in a picture need not have occurred simultaneously. The Committee have not yet in their possession any conclusive evidence as to whether the same flash may be normal in one portion, and ribboned in another portion of its course.

In one picture there is a bright streak on the top of the flash; then about  $\frac{1}{4}$ th inch of ribbon-like light, the folds following the sinuosities of the bright streak; then a dark band, parallel to, and following, every irregularity of the bright streak; and then nearly another  $\frac{1}{4}$ th inch of ribbon-like light. In another picture a very thin beaded flash has a precisely similar beaded streak, rather fainter than itself, running parallel to it, at a distance of about  $\frac{1}{10}$ th inch on the paper.

It might be suggested that the second fainter image was formed by internal reflection from the back surface of the glass plate; but it should be noticed that sometimes very thin flashes, which are not particularly bright, are so duplicated.

A far more probable cause is the double image formed by the internal reflections of doublet photographic lenses. All doublets are essentially two meniscus lenses, mounted with their concave surfaces facing one another. The greater portion of a strong point of light, passing through both lenses, forms the usual image on the plate; but a smaller portion is reflected from the concave surface of the rear meniscus on to the concave surface of the front lens, and from thence back through the rear lens to the sensitive plate. The amount of displacement depends on the angle formed between the direction of the bright point and the optical axis of the lens.

Mons. C. Mousette, of Paris, showed the writer of this report some photographs of the sun in which this double reflection image was very conspicuous; and there is not the slightest doubt that some lightning flashes are bright enough to give this secondary image. Mons. Mousette also showed the writer the photograph of a flash in which the centre of the flash was whitest, with a darker edge on either side. This may have been produced either by double reflection from the lens, or by internal reflection from the back of the glass plate. Two bands of light—the primary and secondary images—slightly overlapping, would form an extra bright band where the overlap took place.

In the majority of cases, the folds of the ribbon formation are most obvious when the course of the flash is square to the width of the folds, and they are but slightly pronounced when in a line with them. This would suggest the idea of a shaking of the camera in the direction of the folds of the ribbon; but if this is so, the duration of a lightning flash must be much longer than is usually supposed.

The Committee hope to have the opportunity of making some experiments on the photography of sparks from a coil or electrical influence machine.

The Committee in the meantime must defer expressing an opinion as to whether lightning ever really takes a ribbon-like form till further evidence is available; but would point out that both sources of error—the duplication of the image either by reflection inside the lens, or by reflection from the back of the plate—would be avoided by the use of single lenses, and of paper instead of glass supported films. The Committee also forbear for the present from publishing a reproduction of a ribbon-like flash, till they are satisfied that such a form of lightning really exists; and that the whole appearance is not due to photographic causes.

*Anomalous Appearance.*—In one picture sent, by Mr. Shepherd, there are five ordinary white flashes and one dark streak of precisely the same character as the bright streaks. M. Mousette has suggested that this may be the result of a very bright flash, so over-exposing the plate as to produce the well known inversion of a negative by over-exposure, as when the ball of the sun appears black on the positive print, instead of white. This is no doubt a possible explanation; but the Committee would like further examples of this same appearance of dark flashes before expressing an opinion on the matter.\*

*Pictorial Representation of Lightning.*—The Committee wish to call attention to the fact that there is not the slightest evidence in the photographs of lightning flashes of that angular zig-zag or forked form so commonly seen in pictures.

In connection with this, they would call attention to a remarkable paper communicated to the British Association in 1856, by James Nasmyth, F.R.S. (*Report Brit. Assoc. 1856*, p. 14). Mr. Nasmyth says that he has never seen forked lightning such as referred to, and asserts that "the true natural form of a primitive flash of lightning appears to Mr. Nasmyth to be more correctly represented by an intensely crooked line, and on several occasions he has observed it to assume the forked or branched form, but, as before said, never in the zig-zag dovetail."

## CHAPTERS IN ELEMENTARY PHOTOGRAPHY— A GUIDE TO BEGINNERS.

BY W. M. ASHMAN.

FIFTH ARTICLE.

*Detective Cameras.*—Few photographers, at the present time, consider themselves fully equipped in the way of apparatus if their stock does not contain a detective

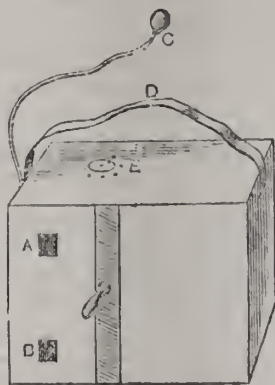
\* It is to be remembered that where the flashes cross each other, and consequently produce a double exposure of those parts of the sensitive plate, no darkening is observable.



camera. These little instruments have lately become quite fashionable, and if it should often happen that the representations obtained by their aid are more grotesque than picturesque, they may nevertheless serve a useful purpose.

In outward appearance, detective cameras may differ widely, according to the particular notions of any individual designer; and as these latter are now rather numerous, one cannot be certain that at any moment he or she is not being caricatured in some ludicrous attitude. A passer-by, fortified with a miniature set of apparatus concealed in his hat, vest, a brown paper parcel, valise, or other common-place article, which for the purpose is capable of use as a delusive snare, may thus get a good deal of amusement by unobservedly photographing the antics of others. In this capacity it has earned the character of being a nuisance. One of the early forms of detective cameras may be found in the historical collection photographic section, South Kensington. It was designed by Thomas Bolas, and described by him in a paper read before the Photographic Society at the meeting held on January 11th, 1881, and the description is reproduced in the PHOTOGRAPHIC NEWS for January 28th, 1881, the object being to provide our detective police force with efficient but disguised photographic outfits to assist them in their duty of detecting crime. If the Scotland Yard authorities have not taken advantage of the practical suggestions offered ere this, they surely cannot much longer ignore the value of this branch of photography, which is so bound up with the interests of their department.

Subjoined is an illustration of the Bolas detective camera.



A. Aperture for working objective. B. Aperture for finder objective. C. Pneumatic ball and tube. D. Strap for carrying. E. Focussing head

Quoting from the original paper, we find that "it consists of a double-bodied camera in which each half measures three by four inches inside, and this can be moved backwards or forwards by means of rackwork gearing. Each division is fitted with a  $4\frac{1}{2}$  inch focus rapid symmetrical, the image formed by one lens being received by a ground glass screen set in the immovable part of the camera, while the other image impinges upon a sensitive plate contained in an ordinary dark slide." Both images are in focus at the same time, and a pneumatic shutter closes the aperture. The whole, with thirteen double dark slides, are enclosed in a rectangular box, the only exception being the pneumatic ball.

Neatly finished detective cameras are kept in stock by most dealers, designs of which can be had on application to these firms. As a rule, the most modern development of the detective camera may be described as a rectangular box having an outside covering of leather. The inside is fitted with a small bellows-body camera intended to take a quarter-plate, 5 by 4 inches, or a half-plate size negative. The lens is one of rapid rectilinear type, with a quick-acting shutter attached thereto, and there are one or more poubles dark slides charged with sensitive plates, or

the equivalent, the roller dark slide, the changing-box, the endless band, the case of plates in metal sheaves, the double box, &c. Outside, provision is made for adjusting focus of objects close at hand or at varying distances from two to ten feet, beyond which all objects included in the field of view would appear in focus. This advantage is effected by moving a lever or thumbscrew arrangement forwards or backwards along a graduated scale, which governs the distance between the lens and sensitive plate or other film. At the top and one side of the front, short focus bi-convex lenses are inserted. These are designated view-finders. Whatever be the nature of the subject in front of the camera, or rather within the range of the principal lens inside, there will be an image of that subject impinged upon a reflector fixed at an angle of  $45^\circ$ , and this image will be reflected upon a small square of ground glass let into the top or side. Tabs of leather cover these miniature cameras and other working parts when not required to be exposed for use. In the most complete instrument of this class the writer has yet seen, all adjustments are made from the exterior, but none are distinguishable except, perhaps, to the suspiciously critical.

If the foregoing remarks should induce any reader to fit up a detective camera for such especial purpose as that of photographing in the public thoroughfares, I can safely advise the selection of a quick-acting lens of from 4 to 6 inches equivalent focus, even if it be an old one, so long as it has been corrected for chemical and visual focus. This will be discussed in the seventh article. At present these very quick-acting lenses can only be obtained in the type known as portrait combination. The distinct advantage offered is the large volume of light which can be admitted whenever needed, as on dull days, coupled with the facility of diminishing this power by reducing the working aperture with a diaphragm when requisite. Short focus lenses of the class referred to give good size images at ten or a dozen feet distant; they are unsuitable for objects quite close, but this is compensated for by the outside case being of smaller dimensions than for a long focus lens. Photographs taken with a detective camera are often wanting in sharpness of detail; this may be due to careless focussing, but it more often results from an unsteadiness of the instrument during exposure. No one would believe how difficult it is to hold a camera quite still, or indeed to stand very steady, without vibration, until they have experienced a few failures in this endeavour.

In the next article the method of constructing and use of the singlelandscapelens will be considered. Other forms used by photographers will afterwards be described.

## LAW FOR PHOTOGRAPHERS.

BY S. J. DEBENHAM.

### CHAPTER VII.

#### BUSINESS TRANSACTIONS (*Continued*).

##### *Arrangements with Dealers, Workpeople, and Others.*

I PROPOSE now to deal with the subject of work done for photographers and goods supplied to them by the trade, and work done by persons employed out of doors, including carriers.

If a contract be made for the performance of any work, an engagement is implied by law on the part of the person undertaking to do the work, that it shall be done with proper care, diligence, and skill.

But in the case of a vendor of goods or materials sold, does he warrant their quality? A great authority on contracts (Chitty) says:—"The rule is 'caveat emptor,' and, generally speaking, no liability is incurred because of the bad quality or defect in the article sold, unless there be such express warranty (Chitty on Contracts, 416). This rule is, however, subject to such exceptions that it is almost a dead letter, and, in fact, I think it will not bear examination. I shall refer to it at some length later on.



If an agreement be made that a certain work shall be performed for a fixed price, the price must suffer abatement if the work or materials used in it were of inferior description and value to what was intended, and the claim for payment cannot be enforced at all if the work is inadequate for the purpose it was undertaken to fulfil.

If an agreement be made for certain work to be done, and the customer or party to be served refuses to perform, or renders himself incapable of performing his part of the agreement, the other may either sue for a breach of the agreement, or rescind it, and claim payment for what he has done.

And if there be no contract to complete the work before any remuneration or payment be due, the workman may, if the work be apportionable, after he has proceeded with a portion of the work, refuse to continue it until he has been paid for the work performed, and may recover payment for what he has done. I must illustrate the proposition by giving a case or two in point.

In *Roberts v. Havelock*, the plaintiff had agreed to put a ship belonging to the defendant into complete repair. Before this had been completed the plaintiff demanded payment for what he had already done, and refused to finish the job without it. This was refused. An action was brought, and a verdict having been found for the plaintiff, the defendant moved to set it aside, on the ground that the contract had not been performed. Lord Tenterden said, "I have no doubt that the plaintiff was entitled to recover. There is nothing in this case amounting to a contract to do the whole repairs, and make no demand till they are completed."

It would have been otherwise if a price had been agreed on. In *Sinclair v. Bowles* (an earlier case) the plaintiff had repaired three chandeliers for defendant, and had agreed to do the work for £10. The action was brought to recover £5 for the work done. The Court held that the contract was entire, and the plaintiff, not having completed his part, was not entitled to recover anything.

And, of course, the doctrine of *Roberts v. Havelock* does not apply where what has been done would be utterly useless of itself; e.g., if a man agrees to paint my portrait, he cannot stop short at a portion of the face, and strike when he has done the chin or the forehead merely.

Again, as a general rule, if a fixed amount be agreed on for the performance of a given work, and this be not completed through no fault of the contractor, there being also no fault on the other side, the amount cannot be recovered, or a proportion of it (called in law "quantum meruit"). "If a sailor hired for a voyage take a promissory note from his employer for a certain sum, provided he proceed, continue and do his duty on board for the voyage, and before this be completed he dies, no wages can be claimed either on the contract or a 'quantum meruit'" (*Cutter v. Powell*).

If an agreement be made that certain work shall be done by one of the parties to it, and this is prevented by illness, no action will lie against the party for breach of the agreement. The following case is the authority for this:—The plaintiff contracted with a wife (as her husband's agent) that she should play the piano at a concert to be given by the plaintiff on a specified day. She was on that day unable to perform through illness. The contract contained no express terms as to what was to be done in such an event. An action was brought against the husband for breach of the contract, and it was held that the wife's illness and consequent incapacity excused him, inasmuch as the contract was in its nature not absolute, but conditional upon her being well enough to perform.

And, of course, an occurrence not preventable exonerates from liability for breach. Where a horse was sent by a steamboat from Aberdeen to be delivered in London, and a storm arose, during which the animal was so injured that it died, and the jury found that the injury was caused partly by bad weather and partly by the struggling and

fright of the horse, and not by negligence of defendant, he was held not liable.

Proper care must be exercised by all persons with regard to the work they are to do, and the material entrusted to them. It must not be supposed that anything short of impossibility will exonerate from liability, either as regards the performance of a contract or the exercise of proper care. A workman for hire is not only bound, if entrusted with the goods of his employer, to guard the same against ordinary hazards; but, likewise, to exert himself to preserve it from any unexpected danger.

Hence, if negatives are sent out to be printed, retouched, or enlarged, &c., and are damaged by the person employed (called in law bailee) the latter can be made responsible.

*Leck v. Maestee* was an action brought for injury caused to a ship docked for repairs, through the bursting of dock-gates; and although this was occasioned by an unusually high tide, as it was shown that by the exercise of greater care the damage might have been prevented, the plaintiff recovered a verdict. Such an occurrence as the storm above referred to is called an act of God, and, although damage arising from an act of God, as in the storm and the lady's illness, in general exonerates from liability, if it is anyhow possible for the defendant to prevent the injury, the liability arises.

Where a defendant charged with negligence has been guilty of a breach of duty sufficient to produce the damage complained of, he cannot escape the liability by showing that the same damage would have arisen from some other cause beyond his control if he had done his duty. The damage, however, may be apportioned.

The defendant will not be liable if the plaintiff has been guilty of negligence himself. This is called "contributory negligence," but contributory negligence will not exonerate the defendant if he could in the result, by the exercise of ordinary care and diligence, have avoided the mischief which happened.

The following case shows what contributory negligence is, and illustrates these remarks; it was decided by the House of Lords on appeal. A railway company was in the habit of taking full trucks from the siding of a colliery owner, and returning the empty trucks there. Over this siding was a bridge eight feet high from the ground, which belonged to the plaintiffs, the colliery owners. On a Saturday afternoon, when all the colliery men had left work, the servants of the railway ran some trucks on the siding. All but one were empty, and that one contained another truck, and their joint height amounted to eleven feet. On the Sunday evening the railway servants brought on the siding many other empty trucks, and pushed forward all those previously left on the siding. Some resistance was felt, the power of the engine pushing the trucks was increased, and the two trucks the joint height of which amounted to eleven feet, struck the bridge, and broke it down. In an action to recover damages for the injury, the defence of contributory negligence was set up. They insisted that the plaintiffs ought to have moved the first set of trucks to a safe place, or at all events not to have left the truck with the other truck in it so as to be likely to occasion mischief. The Judge at the trial told the jury that the plaintiff must satisfy them that the accident happened solely through the negligence of the defendant's servants, for that if both sides were negligent, so as to contribute to the accident, the plaintiffs could not recover.

This was held to be a misdirection, and a new trial was ordered.

I had a case lately in which damages were claimed for the destruction of a negative entrusted to printers. The defence was that a messenger had been employed by defendants to carry home the negative, and, it being a windy day, the wind blew another parcel he was carrying against the negative and broke it. The judge gave a verdict for the plaintiff. In this case there was, no doubt, neg-



gence, the negative having been sent home unpacked, tied up in paper merely, and the messenger having been (as we contended) overloaded with parcels, so that he dropped the negative in the street. The defendants also claimed exemption on the ground that they, by a paragraph in their printed price list, disclaim and renounce all responsibility. I see by a recent article in a photographic publication this is considered to have been a just defence; but even if brought to the plaintiff's knowledge, it cannot excuse negligence.

The liability of a carrier is more absolute than that of ordinary bailers for hire. He is, in fact, an insurer. It is, of course, understood that the word carrier includes railway companies, steamship companies, parcel delivery companies, &c.

A carrier is liable as on a warranty, and whether there is negligence or not is immaterial. Nothing but "the act of God, or the Queen's enemies" (a nation at war with us) exonerates him; not even robbery or an accidental fire. He may, however, limit his liability by special contract with his employer, but, again, it is for the Court to say whether such contract is reasonable; and there have been various conditions and contracts to escape liability which will not stand the test of a trial, *i.e.* :—

1. A condition that the company shall not be responsible for the loss, detention, or damage of goods insufficiently packed, is unreasonable.

2. So is a condition that where goods are conveyed at a special mileage rate, the carrier is not responsible for any loss or damage.

There have been various Acts of Parliament passed respecting the liability of carriers, but to enumerate the provisions of these would be tedious. (Any Acts of Parliament can be obtained at the Government printers in Fetter Lane, by those anxious to have them, for a very moderate sum.) I must, however, mention one provision, *viz.*, that carriers are not liable for certain valuable goods beyond £10, unless the value be declared at the time of booking, and a fee paid if required.

A carrier is liable either to the sender (consignor) or recipient (consignee) of the goods.

I have reserved for the end of this chapter further remarks on the statement with which I opened, *viz.*, that though a warranty be implied on a contract for work, it may not be on a sale of goods. This must be qualified by the statement that if goods be defective or bad, the vendor is liable to the purchaser in damages, and in the case cited below, he was held liable, though he might not have known of the defect.

Therefore, where a person has been induced to buy goods by a fraudulent misrepresentation, he is in general not only entitled to sue the seller for the fraud, but may also, on discovering it, rescind the contract, and if he has paid the price, recover it back under a claim for money (technically) had and received to his use.

And where a chattel is sold for a special purpose, there is an absolute implied warranty that it is reasonably fit for that purpose, and the vendor is liable. The following case is the authority.

*Randall v. Newson* was an action brought for damages occasioned by the defendant negligently supplying the plaintiff with a defective carriage pole, which broke and injured the plaintiff's horses.

At the trial the Judge left two questions to the jury. 1. Was the pole reasonably fit and proper for the purpose for which it was intended? 2. Was the defendant guilty of any negligence? The jury answered both questions in the negative, and the judgment was entered for the plaintiff.

The defendant having obtained a reversal of this judgment from the Divisional Court, the plaintiff appealed to the Court of Appeal, and this court gave judgment in his favour.

Lord Justice Mellish quoted with approbation Chief Justice Best as follows: "If a man sells an article, he

thereby warrants that it is merchantable—that it is fit for some purpose. Whether or not an article has been sold for a particular purpose is, indeed, a question of fact; but if sold for such a purpose, the sale is an undertaking that it is fit." The law then resolves itself into this—that if a man sells generally he undertakes that it shall be fit for that particular purpose." The governing principle, therefore, is, that the thing offered or delivered under a contract of purchase and sale must answer the description of it which is contained in words in the contract, or which would be so contained if the contract were accurately drawn out."

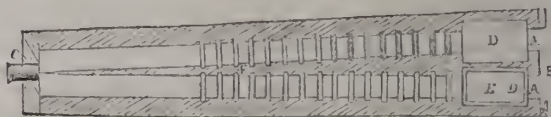
If mounts be supplied with deleterious ingredients which destroy or injure the photographs, there would be a remedy against the vendor under this case; and a leaky camera, bad paper for printing, &c., come under the same category.

In *Downes v. Fallowfield*, the latest case as to injurious mounts, the judge holds that though the photographs be faulty from fading, the spots caused by the mounts give ground of action. This will appear more fully when the judgment is reported.

#### A DESCRIPTION OF THE TINTOMETER, WITH SOME REMARKS ON ITS APPLICATION TO CHEMICAL ANALYSIS.

BY J. W. LOVIBOND.\*

In a paper of this nature it would be out of place to enter further into general laws than is necessary for the purpose of illustration. I have, therefore, confined my remarks, as far as possible, to a description of the construction and use of the instrument, which consists of a tube divided by a central taper partition B, ter-



minating in a knife edge at the eye-piece C. This knife edge, being inside the range of vision, is not seen when the instrument is in use. At the other end of the instrument are two apertures D D, of equal value, alterable in size and shape by means of diaphragms. The two apertures are here divided by the thick end of the central partition B, which, together with the sides, is recessed by grooves in order to hide the edges of the standard glasses and of vessels placed in the tube for observation. The top is provided with slots in line with the grooves, to admit and guide the standard glasses; and the whole is arranged in such a manner that the only light which can reach the eye must pass in equal quantities on each side of the partition, up the two tubes, illuminating the object under examination on one side and the measuring glasses on the other.

For measuring colour in opaque objects the instrument is fitted to a hinged stand, capable of being placed at such an angle as reflects the light from the whitened bottom and sides through the tubes to the eye, so that on looking through the eye-piece two white, equal fields of view are seen. The object to be measured is placed on the stage under one tube, and the standard glasses worked in the other against the white background.

The instrument as now shown is the sum-total of attempts to overcome difficulties which were discovered and met in detail whilst carrying on colour investigations of a commercial character, and, until remedied, made the work unreliable and misleading. The causes of error were traced to many and various sources: to the intensity of light from opposite directions morning and evening, to the lights and shadows cast by large objects both outside and inside the room, to the window or apparatus not being central to the bars of the window, and even to reflection from the section of wall outside the window. Also, until tubes were discarded in favour of parallel-sided vessels, the convexity of the tubes, which magnified these errors as by a lens, caused disappointment, after apparently obtaining a perfect balance of colour, to find that a small alteration of position entirely upset the most careful reading.

\* A Communication to the Society of Chemical Industry.



## THE STANDARD GLASSES

Consist of coloured slips cut to a size fitting the grooves of the instrument. The slips are arranged in series; all the slips of each series are of the same colour, varying only in depth of colour; the variation is in regular degrees, each degree being of the same tint-value as that chosen for the starting point or unit of the series. Thus a single glass of 10 degrees tint-value has the same value as 10 glasses, each of one degree. Every slip is marked with the number of degrees or the tint-number which it represents, also with a denominational or colour number showing to which series the slip belongs.

The tint formed by the superposition of several glasses belonging to the same colour series is equal to the aggregate of tint-numbers on the glasses used, whilst the superposition of glasses from several series gives a compound colour which follows the laws applicable to the mixture of pigments, in contra-distinction to the laws belonging to the mixture of spectrum colours.

## THE UNIT.

In fixing the value of the unit, the first effort made was to find a basis of common value applicable to all colours, but the unequal absorption of light by different colours proved an effectual barrier, some building into darkness by superposition of glasses at a much quicker rate than others; thus, with a medium north day light a red requires 77 of its own units, a blue 222, and a yellow 239. The differences are still greater in more composite colours.

From this it was evident that each colour having its individual rate of absorption, it must have its individual progressive unit, which, with a few exceptions, is not applicable to another colour.

This enforced limitation of the value of each unit to its own colour is, as regards a common basic unit, restrictive, but beyond that point very expansive, permitting the unlimited addition of new colours for standards without in any way altering the value of those already in use, or interfering with the value of registered work previously done. It was ultimately decided that the eye being the sole judge of difference, and noting that the powers of differentiation decreased as the tint increased in depth, the tint unit should be as light as consistent with the possibility of the addition of a single unit being distinguishable in the deeper shades; while for lighter shades, where the perception is keener, the tint unit may be divided, if necessary, into decimals of the original unit. The range of colour which can thus be brought to measurement is very wide, ranging from most of the brilliant aniline colours to the dingiest cloth; the only apparent limit lies in the variety of coloured glass obtainable for standards.

## MEASUREMENT OF LUMINOUS BODIES.

Adopting Professor Church's definition of all visible bodies as being either luminous or illuminated, I propose first to deal with luminous bodies in reference to their measurement for intensity and colour.

*For Intensity.*

To measure for intensity, having closed one tube by a stop, it is necessary to pass the rays to be measured through the other tube, under definite conditions as to distance, area, screen, or other governing influences, then intersecting these rays with graded glasses of a neutral tint until the light is entirely blotted out, when the number of degrees required to accomplish this can be read off and will be an index of intensity.

*For Colour.*

Circumstances have prevented much attention being as yet given to the colour of illuminants, and I can do little more than suggest some few precautions which would probably occur to any investigator. Rays from the illuminant should be caught on a screen commanded by one tube under known conditions, as already described in measuring for intensity, whilst the other tube should command a standard white field of view against which to work the measuring glasses.

One of the instruments on the table is roughly arranged to show the spectrum nature of the coloured light from red, blue, and green glass reflected from a whitened surface, and passed up one of the tubes, the glasses themselves being kept out of sight, as against the pigmentary nature of colours obtained when similar glasses are superimposed in the other tube; the use of graded glasses gives a new interest to this class of investigation.

## MEASUREMENT OF ILLUMINATED BODIES.

*Transparent.*

For measuring and recording tint and colour in transparent liquids, a graduated series of accurately gauged vessels with parallel colourless glass ends are adapted to the instrument. These range in thickness from  $\frac{1}{8}$  of an inch to two feet, the smaller vessels being suitable for the darker liquids, whilst the

blue colour in distilled water can be easily measured in two feet. Care must, however, be given both in the distillation and to the pure whiteness of the background.

When the colour of a liquid represents a property or substance, the graded glasses of different lengths and the colour-scale afford a ready means of quantitative estimation of extreme nicety and ease of management, carrying the accuracy of the balance beyond weighable quantities down to the smallest colour trace, as well as being available for larger percentages. The method has been applied to the estimation of colour in dyes, Nessler's ammonia test, carbon in steel, copper both as nitrate and ferrocyanide. It is also under examination for lead as sulphide; here the presence of iron would be a disturbing element. There must be many such possible applications, which would often effect a saving of time and labour by avoiding the necessity of evaporation, drying, and weighing, as well as estimating percentages too small for the balance.

The conditions to be complied with are, first, the colour must bear a definite relation to the substance producing it, and must be, in most cases, matchable by the glasses of a single colour series. Then, by means of a solution of known strength in one of the gauged glasses, the percentage of substance represented by the tint of a single unit must be found by direct experiment. In estimating an unknown sample of a similar substance, it would therefore be, theoretically, only necessary to use the same gauged glass, and multiply the units required to match it by the percentage value of a single unit; but this cannot always be done, as the progressive variations in the colour properties of different substances require great care before finally deciding on the percentage value of a single tint-unit, for the law of regular progression does not always hold, and percentage estimations by means of colour can only be made within this law. The great majority of coloured solutions will, however, at some point of dilution, give the necessary conditions for a quantitative estimation.

In making preparations for colour testing by methods now in use, such as Eggertz' carbon test, and Nessler's ammonia test, the apparatus should be specially useful as a check upon all possible errors which may arise in preparation, and by bringing the practice of all laboratories to a common standard of reference. It is also found useful in noting and recording changes of colour and tint caused by chemical action, time, or other cause.

*Opaque Objects.*

In measuring colour in opaque objects the instrument is fitted to hinged stand capable of being placed at such an angle as reflects the light through the tubes from a stage on which is placed the object under examination, and a pressed plaster of Paris reflector as a standard white to measure from, or the substance to be compared or matched.

The calls upon my time in working out the details of construction, obtaining, and grading the coloured glasses, have been such that I must ask your indulgence for any faults of style, lucidity, and expansiveness in this paper, and I am also painfully conscious of having only touched the fringe of this comparatively new subject.

## DISCUSSION.

The Chairman said that his attention had been attracted to Mr. Lovibond's tintometer when endeavouring to find a reliable means of measuring and recording the colour of potable waters, especially those of the peaty class, the great difficulty being to find a series of standard colours for comparison which could be at once permanent and easily multiplied. He had found the tintometer answered every purpose admirably, and considered it more accurate, more easily used, more permanent and uniform, and applicable to a greater variety of purposes than any other colour meter which had been introduced into the laboratory. The instrument must not be blamed if it did not accomplish impossibilities; for instance, there were mixtures of coloured substances whose resultant colours did not express the ratio of their constituents. The tintometer could not give a correct estimation of such substances as these; but it would correctly record the resultant colour.

## Notes.

A petition placed on the list six weeks ago to wind up the Photographic Company came before Mr. Justice Stirling on Saturday. The petitioner did not appear, and it was understood that his claim was settled.



In Ceylon an Amateur Photographic Society has been established, the members being mostly tea and coffee planters. The membership of the Society is—as may be supposed—widely scattered over the island; and consequently the meetings are held at different stations, and each meeting is preceded by a sort of convention or field day.

Photography is involved in connection with the proposal for a commission on the *Times* charges against members of the Parnellite section; and Mr. Parnell himself, speaking on Monday evening in the House of Commons, said: "The Bill should provide for the discovery of documents, and before the commencement of the inquiry, they should have facilities for seeing these documents for taking photographs of them, and for having them examined by experts."

On the following day we find that a photograph was handed round in the House of Commons as evidence by the member for Fermanagh, the point in dispute being whether a certain Serjeant-Major figured on the platform at a recent political demonstration, where it was asserted he had been photographed. The original negative, combined with the personal evidence of the photographer who took it, might, perhaps, be accepted, but the House of Commons will hardly, it is to be hoped, be rash enough to accept a mere print as evidence.

We referred in our notes of last week regarding the photographic portrait of Charles Dickens, and the veteran photographer, J. E. Mayall, writes:—"I note an interesting article you have written in the PHOTOGRAPHIC NEWS on 'Charles Dickens.' I took him in 1851 for the stereoscope, and made him a present of my views of the Louvre at Paris. He wrote me a characteristic answer of thanks: 'I am deep in "Great Expectations," but I run away every few minutes to look at myself in the stereoscope you have sent me. I begin to think I am not as good as I seem; but what a surprise did that little square box contain! a series of transparencies of my beloved Louvre. How did you arrive at the notion that this is a passion? I think Stone (Frank Stone) is in the secret, and let it out. Never mind; Bells in Regent will ring long and long to have fortunes told by the Photo-Magician, &c.'"

An enterprising keeper of a registry office for servants in New York now photographs every domestic who applies for a situation, and already, though the idea is a comparatively new one, the waiting-room to which mistresses seeking "helps" are shown, has its walls to a great extent covered with the photographic portraits of cooks, housemaids, general nurses, and what not. Thus when certain servants are not actually in attendance, ladies can, with the aid of the photographic gallery, more readily select those girls with whom they wish to have an interview, and it is curious to notice, it is said, how married women of a certain age, well-nigh invariably select cooks who are really as well as nominally plain, and, if possible, house and parlour maids who are positively ugly. When the

husbands come to hire a domestic, though, their attention is devoted chiefly to the more comely likenesses. As soon as a girl is really engaged, her portrait is removed from the wall and placed in one of a series of albums, the date of her engagement, place of service, &c., being written on the back of the portrait for future reference if it should be needed.

The American photographer who wrote offering to take the Duke of York's Column off the Board of Works, and "run" it as an elevated studio, must henceforth hide his diminished head. The French Minister of Commerce has received an application, it is said, from a photographer who is anxious to set up his camera as near the top of the Eiffel Tower as they will let him go.

A photographer, who numbered amongst the studio "properties" a sham book-case with make-believe shelves filled with supposititious volumes, amused himself the other day in writing out, with the aid of some facetious friends, a list of titles suitable for the "dummy" works in question. The following are some of the more appropriate of the names which were suggested:—"Cabinet Secrets," by a Retoucher; "Mounts" for the Cavalry, by a Photographic Veterinary Surgeon; How to make Studio Jelly, illustrated by "Gelatine Plates;" Towns I have "Taken," by General Photographer, F.R.P.S., &c.; "Focus!" Yarns, by a Chemical Salt; "How I removed the Leopard Spots" (a Waiting Room Romance), by A Spotter; "Cameradere," by Two Old Camerades; "A Cure for Club Boxes," by an Instantaneous Shutter; "Roller Slides," by a Plympton Skater; "The Tripodium Vulgaris," by a Photographic Fern Fancier; "Rubbish I have Taken," in 150 Cartes; "Secrets of the Torture Chamber;" Vol. I. The Use of the Head-rest; "How to lay out Back-grounds," by a Villa Gardener; "Fence Taking," by the Amateur on Horseback; "Negative Evidence," by a Detective Camera; "The Photographers Gnyed," by a Sequel to the Hissing of the Daguerreotypers; "Dog Cartes," a companion series to "Cats in Cabinets."

Cricketers have followed the example of bicyclists, and have taken up photography. During the Oxford and Cambridge match at Lord's, several members of the M.C.C. had their cameras on the ground and took instantaneous photographs of the incidents of the play. This photographic ardour is, of course, very praiseworthy, but we hope, in the interests of cricket, that a line will be drawn at the use of detective cameras by the players. It would be extremely irritating if, just at the moment when "point" and "slip" should have their whole faculties fixed upon taking wickets, they should be engaged in "taking" the batsman.

But there is no objection to the umpire indulging in photographic recreation. The vexed question of "leg before wicket" probably might be settled if the batsman were photographed every time he attempted to make a hit. We admit that the game would have to be stopped while



the negative was developed and a print made, but in these days, when cessation of play is of common occurrence owing to the rain, this would not be a very serious drawback. If the possibility of an interval for this purpose caused the game to be started at an earlier hour than is now the case, no one would grumble.

A photographer's dark-room used to be considered "a thing of shreds and patches," an arrangement of string, canvas, paper, and pantile laths. It has now blossomed into a full-blown "fixture." A case in point has just come before the Brighton County Court, the plaintiff suing defendant for £8, value of fixtures and fittings, which fixtures and fittings consisted of a dark room built in an arch. It was stated that for some years the defendant had occupied the arch at a rent of £10 per annum, an arrangement being made that possession should be given up at any time on a fortnight's notice being given. Notice was given on the 7th of May last, and it expired on the 21st of the same month. Defendant, however, stayed on after the expiration of the notice, and paid double value up to the 22nd of June. After the 21st of May the defendant removed the dark-room, and this had to be re-erected for the use of a photographer to whom defendant had sublet the room in question, and who was now renting under the plaintiffs.

The action was a novel one, because it was admitted that the darkroom was built by the defendant, and the point at issue was whether he had a right to remove the fixtures (*i.e.*, the dark room) after the expiration of the notice, although he was in possession of the premises. The Judge decided in favour of defendant, but reserved the question of costs. Meanwhile photographers will feel interested in knowing that landlords attach a value to the dark room. In this case, indeed, the dark room in question appears to have been a specially important one, because we read that "at the time the King's Road promenade was widened the dark-room was extended by the town." It is not every dark-room which is so honoured.

#### PHOTOGRAPHIC OPTICS.

BY A. E. UNDERWOOD.\*

I ONCE had a query propounded to me by an amateur (a lady), which was, "Why is it necessary to use a lens to take a photograph?" As a matter of fact, a lens is not *absolutely* necessary—or, rather, I should say that a photograph can be taken without a lens. You have all heard of pinhole photographs, which are taken by allowing the light to reach the plate through a very small hole placed in the position usually occupied by the lens. Remembering that light travels in a straight line, the rays which reach the hole from the bottom of an object or the foreground will pass through and fall on the upper part of this surface; similarly, rays from the upper part of the object reach the lower part of the receiving surface only, each part of the receiving surface having a view of a very small part of the object. This will also explain the inversion of the image which puzzles many novices. This pinhole performance is very slow, inasmuch as the light which gets through it is very small in quantity; and, to the end of obtaining more light, we substitute for it a lens.

To show what the lens does, we will suppose the pinhole enlarged to (say) one inch, when it will be evident we shall not get any image at all, as the rays from any given point (as here)

will be spread over more than an inch of the screen. Placing in this position a lens which receives at every part of its surface rays from this point, it transmits the greater part of these rays to one point, the focus, and we get definition (or any image) again. The rays of light in passing through the lens are turned out of the straight course which they would have pursued, and the shape of the lens is so arranged that the rays from one particular point are brought together again. This turning aside or bending of the rays of light is called refraction, and occurs when light passes into a medium of different density. If we take two parallel lines to represent a section of a piece of glass, we may represent rays of light falling on the surface so that these rays of light as they enter the glass are deflected from the straight line; and, again, as they emerge, are deflected back, and pursue a course parallel to their original one. But if we take away the parallelism of the two sides of the glass, we alter the course of the rays to the same extent. If we make one side of the glass convex, then a ray striking the bottom will be bent upwards, owing to the angle at which it strikes the outer or anterior surface of the glass.

Similarly, other rays from the same point falling on other parts of the surface of the lens are refracted to the same part. Now although this gives you a correct idea of the action of a lens, there are practically various corrections necessary to fit it for photographic use. The first of these we will take is the correction for achromatism, or chromatic aberration. If you take an ordinary common magnifying or reading glass and look at any object with it, you will find those portions of the object seen at the margin of the lens to be fringed with colours. These are prismatic or rainbow colours, and are caused by the separation of the component parts of the rays of light in their passage through the glass. White light is composed of all the colours of the rainbow, and these different colours are refracted in different degrees in their passage through glass. As you are aware, when light falls at a suitable angle on the surface of a prism, it is completely resolved on its emergence, the violet rays being bent out of their course much more than the red, the extent to which the red and violet are separated being called the angle of dispersion. This occurs in a lesser degree with a lens-shaped piece of glass, and renders it unsuitable for photographic purposes. We have, however, in the different sorts of glass, the means of correcting this, for by suitably combining flint and crown glass in a lens, the dispersive power is nullified or balanced, the refraction alone remaining. A lens thus corrected, by taking advantage of the varying dispersive powers of different sorts of glass, is called achromatic. There are various forms of achromatising used, all having the same practical result.

We now come to the consideration of what is called spherical aberration. If you take an ordinary view lens, and take away the diaphragm from the front or anterior surface of it, you will get no focus to speak of. The reason of this is that the rays of light which fall on the marginal portions of the lens are brought to a focus at a point nearer to the lens, than the rays which fall on the central portion of the lens surface. To obtain sharpness we shall have to take means to prevent the marginal rays from interfering with the central ones, and *vice versa*. This we accomplish by placing a stop or diaphragm a little way in front of the lens. Now we find that the light which comes from the centre of the view or object passes only through the centre of the lens, and forms the central portion of the image, the rays which before fell on the margin of the lens being stopped. The light which comes from the outer portion of the object is in the same way debarred access to the central part of the lens, and passes only through the margin of lens. The centre of the picture is thus formed entirely by the light which passes through the centre of lens, while the outer portions are exclusively produced from the margin of the lens. If we could use the lens without a stop, we should naturally gain rapidly, as the stop cuts off a considerable portion of light, but it is impracticable to do without it.

The relation between the size of stop and focal length of the lens is called the angular aperture, and this proportion regulates the rapidity or slowness of the lens; thus it is expressed as  $\frac{f}{l}$ , which means that the stop is  $\frac{1}{l}$ th of the length of focus of lens; if the focus of a lens is 8 inches, a  $\frac{1}{2}$  inch stop will be  $\frac{f}{16}$ , a stop half the diameter of this will be  $\frac{f}{32}$ , or  $\frac{1}{32}$ nd part of the focus of lens, and will be four times as slow, as only one-fourth of the light passes through it as through the  $\frac{1}{2}$  in. one. This is practically an absolute rule for all sorts and sizes of lenses.

A few words as to where to measure from may not be out of place. The place to measure from is the optical centre of the lens. In

\* Abstract of a paper read before the Birmingham Photographic Society.



a plano-convex it is on the curved surface; in an equal sided double-convex it is in the middle; and in a meniscus it is beyond the curved surface. These single achromatic lenses are commonly called view or landscape lenses. For portraiture they are not, under ordinary conditions, so suitable, on account of their want of rapidity as compared with portrait combinations. Another class of subject for which they are unsuitable is architecture or buildings, as they have a defect called marginal curvature. If you bring a perfectly straight line in any view or subject near to the margin of your focussing screen, you will find that it is not rendered straight, but is slightly curved upwards at the ends; if you have a square object, as a door or window, occupying the full size of your plate, the object will be slightly barrel-shaped; this curvature is, however, so slight, that, unless the straight line is quite near the margin, and occupying the greater part of the length of the plate, it needs a straightedge to detect it.

For general outdoor use, where this slight marginal curvature is of no consequence, the single lenses, both for brilliancy of definition and covering power, are unsurpassed by any double combination. A plano-convex, having a flat side instead of the slight hollow of the meniscus, has slightly different properties from the meniscus, inasmuch as while giving a well-defined centre with a larger stop, it has less flatness of field, and will require a smaller stop than the meniscus to give an equal definition all over the plate. A well-constructed plano-convex will give a well-diffused and brilliant centre with  $f$ , but a meniscus will require a smaller stop for the same central definition, but the definition will be better at the edges of the plate. For purposes where the marginal distortion is inadmissible, it is necessary to use a doublet combination lens, commonly known as rectilinear or symmetrical. With these lenses straight lines are respected and are rendered as they should be. They consist of two similar lenses (meniscus in form) placed at a proper distance apart, with their concave surfaces towards each other, and with the diaphragm between them. These lenses will give a brilliant definition in the central part of the plate without a stop, using the full diameter of the lens, and are on this account called applanatic. They are also more rapid than the single lenses; the usual angular aperture is  $f/8$ , but of late years they are made much more rapid,  $f/4$  and even  $f/3$  being quite usual. This has been brought about largely by having a greater variety of makes of glass to select suitable combinations from. For an amateur who wishes to be able to do various sorts of work a rapid doublet of this type is undoubtedly the most useful lens he can possess. If stopped down sufficiently it is as equal as no matter to any lens for landscapes and views, while for portraits under ordinary conditions, architecture, copying, and instantaneous subjects, it will do what the single lens will not. For architecture and interiors it is often necessary to use a wide-angle lens. This is a short focus lens, the back and front combinations of which are placed much closer together than in a normal angle doublet. The use of this is when a point of view cannot be obtained at a sufficient distance away to enable the whole of the desired object to be included in the plate. If, for instance, you take a view of Lichfield Cathedral at close quarters, you cannot, without using a wide-angle lens, include the entire building on your plate; it is too large with an ordinary lens. The shorter the focus of a lens, the smaller the picture formed by it; so that you have to use a lens of sufficiently short focus to make the image small enough for the plate. There is one drawback to the use of a W.A. lens, and that is that it gives an extreme or exaggerated perspective. This is very noticeable when the side of a long building is taken. It can hardly be considered to be the fault of the lens, but should rather be taken as arising from the point of view. For this reason a short focus lens should not be used on distant views, its inevitable effect being to dwarf the distances. For this sort of subject the longer focus lens is the better. As a matter of fact, I consider that it is better for most classes of subjects to use a lens of as long a focus as is practicable, say twice the length of the plate when taking portraits, heads, and such like. I have never been pleased with the result when using short focus lenses, and always prefer to use, say, in a  $\frac{1}{2}$  plate, a 1-1 lens of 11 inch focus or thereabouts. In length figures it is of no consequence, but in heads or bust portraits the lens has to be brought much nearer to the subject, and the part of the subject nearest to the lens, whether it be a nose or an ear, is given too large, and out of proportion with the other features.

This may be useful occasionally, as when a sitter has an under-

sized nose, but if that organ is full-sized the sitter will not care so much for the alteration. There are, of course, plenty of cases where no distortion is noticeable, but it is well to bear the tendency in mind. A portrait lens is constructed in a quite different way, and is just the opposite of a wide-angle lens as described. In a wide angle lens the object is to include a large angle of view, the small stop necessitated being of secondary importance. A portrait lens is required to work with as large an aperture as possible, and embraces a comparatively small angle of view. The mathematician, Petzval, of Vienna, was the one to show, practically and theoretically, what should be the construction of a portrait lens. The front lens of a portrait combination is a plano-convex or a very shallow meniscus. This lens, as I have shown you, is troubled with spherical aberration, the image formed by the margin of the lens being brought to a focus nearer than that formed by the centre of the lens. This lens is placed the other way round, as when used by itself the convex side being next the object, and at a suitable distance from the posterior side, is another compound lens.

This lens is achromatic, being formed of crown and flint elements, but is not cemented, the surfaces next each other being slightly dissimilar in curve. It has the peculiarity that the spherical aberration is of the opposite sort to the first-named lens—this being called negative, the other positive, spherical aberration. The two neutralize each other, and give flatness of field with a large working aperture, much greater than is obtained otherwise. The most rapid of this type works with about  $F/2\frac{1}{2}$ , and is eight times as fast as a rapid rectilinear. This large angular aperture with flatness of field is not obtained, however, without one or two disadvantages. Chief of these is what is known as astigmatism. When using a lens afflicted with this defect, you will find you cannot get marginal definition anything like so good as the central definition. Instead of taking an ordinary subject, however, take a horizontal line, and focus on the screen, across the axis of the lens; this you will find to define well; also if you take a vertical line across the axis of the lens, this will also be in good definition. But if you put horizontal and vertical lines across the margins of the screen, you will find you cannot get both of them in focus at the same time. If you get the horizontal lines in focus you will have to alter slightly the distance between lens and screen to get the vertical lines well defined, and then the horizontals are out of focus. This is the defect which accompanies flatness of field obtained in the way I have shown, and I am not aware that it has to any extent been overcome yet. There is another shortcoming—it can hardly be called a defect—in portrait lenses, and that is the want of depth of focus or definition. By depth of focus is meant the power to define on the flat surface of the focussing screen objects situated at different distances from the camera. In a portrait lens this quality is least present, and it can only be obtained at the expense of rapidity, by stopping down; there is no other way of obtaining it, no matter what the construction of the lens. It is of course in views and landscapes this quality is most needed, for technical excellence, any way, demands that foreground, middle distance, and middle distances shall be in sharp and crisp focus. For portraits it is less necessary. The measurement of the focus of compound lenses—the equivalent focus, as it is called—is not quite so simple as with single lenses. One way is to stick up a piece of printed matter, and drawing out the camera to about double the usual extension, move the camera nearer or farther away till the printed matter, when focussed, is exactly the same size as the original. Then measure the distance between the printed matter and the focussing screen, and one-fourth of that distance will be equivalent focus.

## PHOTOGRAPHIC EXPEDITION TO MOUNT ETNA.

BY VITTORIO SELLA.

### PART I.

SINCE a long time I had planned, from a wish for novelty, and a desire for a change from the white and familiar summits of the Alps, a visit with my photographic apparatus to the black lava and the smoking crater of Mount Etna.

Last June I was able to carry out my project. My friend Z. was my companion. We went by sea from Naples to Messina in a mail steamer, and afterwards to Catania by railway. Unfortunately we could not visit Taormina, that famous city, once so beautiful, and the capital of Sicily. Situated at 300 m. above the sea, it gives a view of the volcano which was judged



as one of the most beautiful scenes that one could contemplate in the world. At sunset it is especially striking, when the sun hides itself behind the cone of Mount Etna, causing its profile to stand out in relief, and illuminating the vapours that are continually exhaled from the great crater.

A distance of two hours from Catania is Nicolosi, on the southern side of the mountain. This village of 300 inhabitants (723 m. above the sea) is the usual starting point for ascents of Etna. Here the Alpine Club of Catania has organised a corps of guides, with fixed prices. One does generally with mules the ascent to the "Casa Etnea" or "Casa Iuglese" (2,917 m.), the only asylum the mountain offers in the high and desert regions.

Owing to the condition of the ground and the hot climate, it is wise to profit by mules.

It is the custom to start soon after noon in order to arrive at the "Casa Etnea" before sunset. We preferred start early in the morning, so as to avoid the sun in these hot low regions.

During the last eruption of May, 1886, a stream of lava stopped at a few meters from the houses of Nicolosi, greatly alarming the inhabitants. A short distance above the village we saw the rough and black face of this lava stream. The new crater opened on the southern slope of the mountain. The "Capillos" and scoriae which were emitted from its mouth, falling around, formed a cone of the height of 200 m. and was called "Monte Gemellaro" by the Alpine Club of Catania, in honour of the brothers "Gemellaro," who contributed memoirs and studies on the subject of Etna.

Near Nicolosi rise the "Monti Rossi," where the terrible eruption of 1879 originated. The lava that poured from the double crater of these "Monti" formed a river of fire four kilometers wide, which afterwards subdivided itself into several streams, one of which, after having run rapidly for fourteen kilometers, reached the sea, destroying part of the city of Catania. The sight of the results of this eruption, and of others still more remote seen from the slopes of Monti Rossi, produces a feeling of stupor and of sadness at all the destruction wrought by them, that dark surface of rough and sterile lava is a sharp and sad contrast to the landscape of those cultivated and fertile regions.

Mr. G. F. Nodwell describes as follows the eruption of Mount Etna:—"Earthquakes presage the outburst, loud explosions follow rifts and *bocche di fuoco* open in the sides of the mountain; smoke, sand, ashes, and scoriae are discharged, the action localizes itself in one or more craters, cinders are thrown up, accumulate around the crater and cone, ultimately lava rises, and frequently breaks down one side of the cone where the resistance is least. Then the eruption is at an end."

Continuing towards the "Casa Etnea," one meets with many other cones or craters which attest ancient eruptions. All these cones, the one rising on the other, like steps on the slope of the mountain, recall to the mind the fable of the ancients, that the Giants, wishing to escalate the heaven, had accumulated mountains upon mountains.

We reached, after three hours of easy walking, the "Casa del Bosco." Some campestrial quords dwell here part of the year. We are obliged to lay in a store of water at this spot, as none is to be had higher up, except snow water. A little further one leaves the woody region and enters the barren one. Here and still some turfs of "Spino Santo" *Astragalus Siculus*, which with their round and thick form make soft but treacherous pillows for the thorns they hide. Very soon this scarce vegetation ceases. The ground is of an arid appearance, and the ascent is steeper. The terminal crater is hidden from us, and a thick fog wraps us round and refreshes and restores us. We remember the Alpine atmosphere. As the fog grows thinner we see our right on high a reddish mass, which is called "Montagnola" (2,642 m.), an important crater which was in activity in the last century and produced an immense stream of lava. A little later, the steep ascent ceases, and we arrive on the "Piano del Lago," a great altipiano of an arid surface, all of dark and uniform sand. The "Casa Etnea" and the great crater come again into sight, and give us new strength to go on in that monotonous desert.

A very strong and cold north wind blows the sulphurous gases which the great crater emits from time to time in our faces, but without annoying us much, and accompanied us to the "Casa Etnea."

The ascent from Nicolosi took nearly seven hours. A remarkable lowering of temperature was felt; in the night it descended to freezing point. From our observations we found that from Catania to the top of the volcano there might be a difference

of thirty-six centigr. This would be in summer, when the African wind blows. In autumn and in fine days during the winter the difference is smaller.—From the *St. Moritz Post and Davos News*.

(To be continued.)

## A WAY TO FIND OUT IF PLATES HAVE BEEN EXPOSED, AND SOME NOTIONS ABOUT COMPOSITE PHOTOGRAPHS.

BY PROF. KARL KLAUSER.

It happens sometimes to amateurs of a nervous disposition to expose a plate, forgetting to mark it as being exposed. This doubtful plate ought to be set aside for examination in the dark-room. Immerse the corner of the plate which you suppose to have received the greatest light, the sky in a landscape, slanting in a strong developer for an inch, or more for larger plates. After a minute you will know if the plate has been exposed by faint traces of the sky, &c. In that case proceed to develop your plate in the ordinary manner. If no image will show, return the plate to the plate-holder after having dried off the corner which you had immersed in the developer with some blotting paper. The plate was not exposed at all, or else under-exposed. In the first case the plate is intact, and may be used as such. If impressed by a too-short exposure a second exposure of longer duration will very nearly obliterate the first, especially of landscape work in shady places. The molecules of the silver bromide will obey with alacrity the summons of a new and longer exposure, and almost entirely eliminate the first impression. As an illustration, I will relate a singular experience. When in Switzerland some years ago, I took a picture of Thorwaldsen's Liou, in Luzerne, one morning. There were a great many people around who stood obligingly still during the exposure. Amateur photographers were not the rule, but the exception. After I had capped my lens I was surrounded by some of the persons whose pictures I had taken. They offered me their cards (most of them adorned with coronets), requesting me to send them copies when finished. Some of them were reckless enough to offer payment in advance, which I fortunately declined; for strolling to the same place in the afternoon I found the lighting of the subject so much better that I resolved to make another exposure, selecting another standpoint. The ground was clear, there being no other persons present than my own party. But, to my dismay, I discovered that I had made the second exposure on the same plate which I had used in the morning. Nevertheless, the plate was developed, and showed a rather over-exposed picture of No. 2, while No. 1, including all the crowd, was gone, and only traces of the highest lights of the first exposure were visible.

The lesson to be learned from this experience is, that any second exposure on the same plate will lessen the force of the first, and any third exposure will lessen both, and so forth. It would be well to take this fact into consideration when attempting the "composite photographs" now in vogue.

In order to arrive at a satisfactory result, the most characteristic, strongest-featured face ought to be taken first, and the others in declining succession. If the faces to be combined should be of a similar texture, as in the case of a number of young ladies, then the exposure should be duly proportioned; that of the first receiving the longest time. Thus, in a case of portraying five sisters, supposing the correct exposure of a single face on a slow plate should be two seconds, divide the time as follows: Give the first face 3, the second  $2\frac{1}{2}$ , the third 2, the fourth  $1\frac{1}{2}$ , and the fifth 1 second.

Composite pictures are of value only when restricted to one family, to one nationality, to one tribe. When extended to a heterogeneous class of forty or more individuals, the results, as shown in some of our monthlies, will tend to illustrate, not the average intelligence, but the average imbecility of the class, be it of professors or pupils.—*Philadelphia Photographer*.

## Reviews.

INTRODUCTION TO THE SCIENCE AND PRACTICE OF PHOTOGRAPHY. By Chapman Jones. Crown octavo, 278 pages. Illustrated, price 2s. 6d. (London: Hiffe and Son, 98, Fleet Street, E.C.)

A COURSE of lectures delivered by the author at the Birk-



beck Institution formed the basis of a series of articles which appeared in the *PHOTOGRAPHIC NEWS*. These chapters have now been somewhat altered, revised, and amplified, the result being the capital hand-book of photography now published.

There are fifteen chapters on the scientific basis of photography, after which we have chapters on apparatus, and the current negative and positive processes. In addition, we have special information on orthochromatic photography, printing in iron salts, platinotype, chromated gelatine, carbon printing, Woodburytype, collotype, reproducing negatives, and testing lenses.

**THE PHOTOGRAPHIC NEGATIVE.** By the Rev. W. H. Burbank. (*New York: Scovill Manufacturing Company.*) Sold by the Eastman Company, 115, Oxford Street, London.

A HANDSOMELY bound and attractive volume of 198 large octavo pages, and issued as a companion book to Burbank's "Photographic Printing Methods," recently reviewed in our columns.

Burbank deals very thoroughly with his subject, and his book will be valued as a useful addition to photographic literature.

**PHOTO-ENGRAVING AND PHOTO-LITHOGRAPHY IN LINE AND HALF-TONE.** By W. T. Wilkinson. Second addition. Crown octavo, 194 pages.

This new edition of Mr. Wilkinson's handy little book will be welcomed by those interested in the branches of photography dealt with.

### INSIDE THE STUDIO.

BY C. BRANGWIN BARNES.

It has often been a source of perplexity, not to say wonderment, to me, as to how and why photographers in general have been led away from the realism of domesticity and homeliness in the interior fittings and furniture of their studios. Why a photographic gallery at first sight should remind one more of an old curiosity shop or the store room of a collector of *bric-a-brac* and antiques, than anything else, I am puzzled to discover. Painters of to-day—that is to say, portrait painters—usually introduce as accessories to their pictures such articles of furniture or virtue as are likely to harmonise with the central subject; whereas photographers, for some occult reason unknown to the writer, seem to have a peculiar furniture of their own. Chairs utterly unlike ordinary chairs are to be found in every studio—perhaps every is too strong a word, so I will say most studios—and are dignified by the title of "posing chairs." These have a tendency to render a photographic portrait to a certain extent unnatural, as do also the miniature tables—or, to coin a word, tablelets—that usually are associated therewith. What is more unnatural than a portrait of a lady in the costume of the present day surrounded by furniture of a description that is not to be found in any dwelling room, or, in fact, in any other room at all than the photographic studio or the photographic dealer's warehouse? Our aim, I take it, is to represent our sitter as at home; and, to do this correctly, why not use furniture of a description that is in every-day use? I should like to see the studio furnished like an ordinary drawing or sitting room, with the exception that the chairs, &c., would not require to be all of one pattern or make, though they should all be ordinary chairs and tables. It was at one time the fashion to represent sitters standing or sitting by the side of a broken column, giving the pictures the appearance of advertisements for some enterprising monumental mason; now they are made to represent advertisements of an entirely new make of furniture. The camera and stand are bound to have their place in the studio, but these should be the only articles of furniture unlike those in an ordinary sitting room.

That relic of bygone days, and aversion of ladies, the head-rest, is still retained in many studios; but it is only on occasions that there is now any real necessity for its use. The introduction of rapid plates has dealt it a severe blow; and, personally, I never use it except for very late sitters, when the sitting is likely to be a prolonged one, or in the case of an exceptionally nervous sitter.

Then, why should artificial ferns, palms, and flowers be so frequently introduced in the pictures and kept in the studio, when the real things are, if anything, less expensive, and, of a certainty, much more natural? The presence of artificial flowers stamps the studio as something different from a sitting room; while the presence of real ones lends a charm to the place, and renders it much more pleasant. Have as many plants and sweet-scented flowers as you like as ornaments and accessories, but away with imitations.

Screens are sometimes necessary to obtain effects of light, but I cannot see why studio screens should not be made as like those in ordinary use as possible.

A selection of children's toys is a great acquisition; but there is no necessity why these should not be kept out of the studio until required, as should also be such accessories as swings, hammocks, boats, masts, stiles, fences, &c., which are only rarely used, and the presence of which often makes the studio appear lumbery and untidy. The presence of a singing bird or two in cages will add to the homely appearance, besides which they can often be used as accessories. To keep a studio clean and tidy requires some trouble-taking; it is not sufficient to let the boy sweep it out and pretend to dust it every morning. If the place is to look homely, natural, and nice, a woman's hand is required. Let a man or a boy be ever so domesticated in his tastes or talents, an average woman, or girl, will obtain a better and more comfortable-looking result in one short half-hour than he will in three or four times that period. Let the proprietor's wife (if he has one, and she is at hand) see that the studio is put right and properly dusted every morning before the operator commences work; and, if there be no wife handy, let one of the young ladies on the premises do the duty for her. A studio nicely and tastefully arranged renders it easier sailing for the operator, and pleasanter for the sitters.

The windows of the studio also require cleaning more often than they get done, as a rule. Clean windows, both at the side and at the top, not only make the place look better, but they add to the rapidity of the exposures to a much greater and more marked extent than is generally imagined. Nothing looks worse in a dwelling room than dirty windows, and the same applies equally to the studio. The insides should be rubbed over every morning, and thoroughly cleaned once a week; it is surprising how dirty they will get in a few days, and it can only be discovered by actual experiment what a vast amount of light is cut off, or rather prevented from entering the studio, by dirty or partially cleaned windows. The blinds, especially the white ones, should always be made in double sets, and frequently sent to the wash, as a dirty blind or curtain is more detrimental to rapid exposures than even a dirty window, and the dust and dirt have a way of accumulating on the blinds and curtains very quickly, and in no inconsiderable quantities.

The colouring or decoration of the studio itself is a branch of the subject on which very little need be said here, as utility is the prime question for consideration. I have seen a studio in which all the interior walls were painted a deep chocolate, which had not a bad effect so far as look was concerned, but was, nevertheless, about the very worst colour that could have been hit upon for photographic purposes. A medium grey or pale green is possibly the most useful shade of colour, being pleasing to the eye and giving off soft reflections. While it is beneficial to keep down the polish on all articles of furniture likely to be included in the pictures, it is in no wise a



necessity that the camera or camera stands should also be allowed to lose their pristine brightness. By the aid of a shilling bottle of polish and a medium of that rather rare compound yecept "elbow grease" administered occasionally, they may be kept bright and nice.

The interior arrangements of the studio are more often than enough upset by that photographer's nightmare, a leaky skylight. Woe betide the chair or the background that happens to be beneath a roof of this kind in a smart shower. The main cause of this seems to be an insufficient elevation of the ridge; but the construction of the studio not being the present theme, I must leave the leaky roof for the subject to some future paper.

## Patent Intelligence.

### Applications for Letters Patent.

10,176. JOHN LEWIS, 11, Braithwaite Road, Camp Hill, Birmingham, Warwickshire, for "Improvements in the production of photographs in colours."—July 13, 1888.

### Specifications Published.

16,648. VERNON WARBURTON DELVES-BROUGHTON, 64, Elsham Road, Kensington, W., Civil Engineer, for "Improvements in cameras."—Dated December 3rd, 1887.

The patentee says:—My invention consists of two side arms, on which the camera front and back are racked or pulled out, instead of sliding on the base-board as is usual.

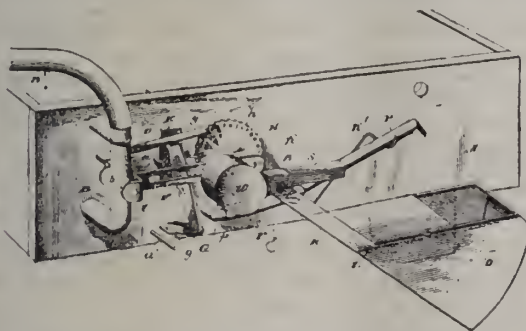
These side arms are pivoted in such a manner that the lens can be elevated or depressed to any angle, the point where the axis of the lens cuts the plane of the plate remaining constant.

The side arms may be jointed or hinged so as to fold round the camera or not, as required.

### Patents Granted in America.

385,607. HARRY FORD, Lyndon, Kans., for "Mechanical photographic bath."—Filed March 22, 1888. Serial No. 268,146. (No model.)

*Claim.*—1. In a mechanical photographic bath, the combination, substantially as set forth, of a water receptacle having a valved supply-pipe attached thereto, a tank pivoted to the water-



receptacle having a weighted arm, and a slotted arm in connection with the valve of the supply-pipe and operated by the weighted arm of the pivoted tank to alternately open and close the supply-valve, substantially as described.

2. In combination with a receptacle or tank having inlet and discharge openings, the inlet-opening provided with a valve, a slotted arm attached to said valve, a counterpoise tank having a weighted arm with a projection which engages with a slotted valve-operating arm, the discharge-pipe having a movable section, and means for automatically and successively supplying the receptacle and discharging the contents thereof.

3. In combination with a receptacle, an inlet-pipe provided with a turning-valve, the slotted arm for operating the same, the counterpoise-tank having a projection which engages with a valve-operating arm, the discharge-pipe connecting the receptacle to the tank, and means for holding the discharge-pipe elevated when the tank is depressed and the supply-pipe closed, substantially as described.

4. In a mechanical photographic bath, a receptacle for the prints provided with a valve inlet-pipe and a movable discharge-

pipe, the tank pivotally attached to the receptacle and provided with a weighted arm which engages with the valve-operating mechanism, the parts being so organized that the valve is successively opened and closed, and the water in the receptacle changed, for the purpose set forth.

5. The combination of a receptacle, A, having a tank with a discharge-opening, a discharge-pipe communicating with the receptacle and tank, and a weight with a projecting pin secured to said tank to engage with a slotted arm secured to the valve-stem, substantially as described.

6. The combination of the receptacle A, having a valved supply-pipe, an arm carried by the valve, a discharge-pipe having a flexible section, and a pivoted tank with a small discharge-opening having a projecting arm which carries an adjustable weighted arm, whereby the water is automatically let in and out of the receptacle, and different levels maintained within the receptacle, substantially as described.

7. In combination with the receptacle A, a supply-pipe having a valve with a slotted operating-arm, a movable discharge-pipe, a pivoted tank having a weighted arm with a projecting pin which engages with the valve-operating bar, and a latch-bar F, with a pawl, the parts being so organized that the latch-bar and pawl will hold the valve closed after the tank has been filled, substantially as described.

8. In combination with a receptacle, A, and valved inlet-pipe, B, the valve thereof having a slotted arm, C, and a projecting pin upon which a pawl, D, is pivoted, a ratchet-disk, H, carrying a pawl, I, a sector, K, with ratchet-teeth with which the pawl I is adapted to engage, said sector having an arm, K', rigidly attached thereto, a discharge-pipe carried by said arm, and a pivoted tank, O, having a weight-carrying arm, said weight engaging with a slot in the arm, C, whereby the valve is operated and the ratchet-disk advanced automatically by the counterbalance of the tank, O, substantially as described.

9. In an apparatus for washing photographic prints, the combination of a valved supply-pipe having a slotted operating-arm, and a pawl which is alternately advanced and retracted the rotary disk carrying a gravity-pawl, and an operating-pin, i, a sector with ratchet-teeth having a pipe-supporting bar, K', a weighted tank which automatically operates the valve, and a latch-bar with a pivoted pawl for holding the valve closed, with which said pin i engages, substantially as described.

10. The combination of the valved inlet-pipe B, the valve of which is provided with a slotted arm, a bar in rear of said slotted arm, rigidly attached thereto, and to the opposite end of the valve-stem, a pivoted pawl, D, carried by the inwardly-projecting end of the bar C', a ratchet-disk, H, carrying a bolt, J, and projecting pin i, a sector having ratchet-teeth with which the pawl J engages, and the arm K', with an outwardly-projecting end forming a support for the discharge-pipe, a pivoted latch-bar having a pawl, G, notch f, and projecting catch g', the pivoted tank having a discharge-opening, and an arm with a socket for adjustably securing thereto a weighted bar, said weighted bar having a projecting pin for engagement with the slot of the arm C, the parts being organized substantially as described.

11. In combination with the pipe B, having a valve, b, with a slotted arm for operating said valve, pins a and a' for limiting the movement of said arm, a pivoted latch, F, having a swinging pawl, G, the downward movement of which is limited by a staple, G, and a notch or catch, f, with which the member C' of the slotted arm engages to swing said latch-bar outwardly, substantially as and for the purpose set forth.

12. In a mechanical photographic bath, the combination, with a ratchet-disk, H, having a pawl, I, with limiting stop-pins k, of a pivoted sector having ratchet-teeth adapted to be engaged by said pawl, and having rigidly attached thereto a pipe-carrying arm which also engages with the upper edge of the pivoted water-tank, substantially as described.

13. In a mechanical photographic bath, the combination, substantially as set forth, of a water-receptacle having a valved supply-pipe, a tank pivoted thereto having an adjustable counterpoise-weight, a slotted arm connected to the supply-valve, and operated by the counterpoise-weight, the serrated sector operated by the pivoted tank, the ratchet-wheel having the pawl on its inner side, and the arm, and stops for controlling the movement of said ratchet-wheel.

14. In a mechanical photographic bath, the combination, with a water-receptacle having a valved supply-pipe, and a pivoted counterpoise-tank in connection with the supply-valve, of a serrated sector, and a ratchet-wheel carrying a pawl, and having

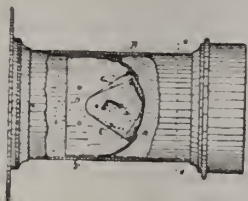


suitable stops for limiting the movement thereof, substantially as described.

15. In a mechanical photographic bath, the combination with a water-receptacle having a valved supply pipe, and a pivoted counterpoise-tank in connection with the supply-valve, of a ratchet-wheel operated by the movement of said counterpoise-tank, and having a controlling-arm, and stops, substantially as described.

385,483. FRANK M. SPAULDING, Kalamazoo, Mich., for "Photographic shutter."—Filed January 16th, 1888. Serial No. 260,830. (No model).

*Claim.*—1. In a lens-tube used in a photographic camera, the combination of the tube F, having the semi-globular-shaped end,



the aperture *a*, and the wings *c c*, adapted to open and close said aperture, as shown and described.

2. In a lens-tube used in a photographic camera, the combination of the globular-shaped end of tube F, the aperture *a*, the wings *c c*, the spring-lever *d*, adapted to stop said wings, the L-shaped slots in the semi-globular shaped wings, as described and shown.

## Correspondence.

### ON THE ADDITION OF CHROME ALUM TO EMULSIONS.

SIR,—The issues of the photographic papers containing the report of a meeting of the Parent Society, at which was read a paper by me entitled "A Few Words on Emulsion Making, and on the Development of Gelatino-Bromide Plates," have just come to hand.

The paper just referred to treated mainly of the effect of adding chrome alum to emulsions, so as to render the films insoluble, and thereby to prevent frilling. Since that paper was written I have had some farther experience, a record of which may, I think, be more or less useful. At the beginning of this year my advice was asked in emulsion matters by a company which was formed to manufacture dry plates, and the giving of it involved a closer connection with the making of emulsions on a tolerably large scale than I have before had, the batches being generally made up with one hundred ounces of silver nitrate at a time. The circumstances were particularly unfavourable to the turning out of uniform batches of plates, but were only too favourable to a study of the effects of the addition of chrome alum to different kinds of gelatine, inasmuch as special emulsion gelatine is not to be obtained in this country (Japan), and, on account of mistakes that it is not at all necessary to enter into here, a quantity that was ordered from Europe never came to hand. The only thing that could be done was to buy such gelatines as had been imported for culinary purposes, and to make the best possible of them. A great variety of such gelatines were found, but of one kind there would generally be in stock only a few pounds. The variations in quality were very great, even amongst such gelatines as were not found to be quite unfit for making emulsions. Where the gelatines were tolerably hard, even without the addition of chrome alum, I found that the rule which I gave in the paper that I have already referred to could be quite well relied upon; that is to say, that a quantity of chrome alum (with the free acid neutralized) equal to one-half to one per cent. by weight of the gelatine used, might be added. In the cases, however, of some very soft gelatines, or rather of some that tended to expand to a

great extent in water, it was found desirable to add just as much chrome alum as could be safely added even to gain a tolerable degree of immunity from frilling. In such cases the following procedure was adopted. A small quantity of the emulsion, generally one ounce, was placed in a beaker, and the chrome alum solution was run very slowly into this from a burette until coagulation took place. One-third of the observed quantity was then added to each ounce of the emulsion. This I consider to be about the limit of safety. In the case of some gelatines the quantity thus added—not in the first experiment pushed to coagulation, but the amount actually added to the emulsion—was as much as three per cent. of the gelatine, an amount that will instantly coagulate many kinds. The chrome alum was always added at the time of the first melting, after precipitation with alcohol, and washing.

Ammonia, if added in sufficient quantities to a solution of chrome alum, will destroy it entirely; but a moderate quantity of ammonia added to a solution of gelatine which has been treated with chrome alum will not counteract the effects that have been produced by the chrome alum. This fact was first made patent to me by the attempt to liquefy, by the addition of ammonia, an emulsion which had been accidentally coagulated by the addition of too great a quantity of chrome alum. The ammonia only served to harden the coagulated gelatine. I therefore find it unobjectionable to add a small quantity of ammonia—about one minim to the ounce—to the emulsion after the chrome alum has been added. This addition favours the accession of sensitiveness by melting the emulsion several times. It is mentioned by Captain Abney that such a procedure is likely to produce spots in the plates coated with the emulsion. I can only say that in this my experience differs from that of Captain Abney.

A question was brought forward by Mr. W. E. Debenham during the discussion on the paper as to the "saturation point" of bromide of silver gelatine emulsions. My original statement in connection with this matter was something to the effect that, with a fixed quantity of silver nitrate, and of excess of bromide, a certain quantity of water was necessary to make it possible to support, in the form of an emulsion, the whole of the silver bromide produced, and that this quantity varied little, with the quantity of gelatine, within wide limits. In other words, that in a given amount of water only a limited quantity of bromide silver could be supported, and that the quantity was not modified by modification within wide limits of the quantity of gelatine used for emulsification, or at any rate was not appreciably modified. I gave the example of 400 grains of silver nitrate, an excess of bromide of about fifteen or twenty per cent., and stated that the amount of water necessary to support the bromide of silver produced would be about twelve ounces in the case of a neutral solution, about eight ounces if one quarter or more of the silver nitrate were converted into ammonia nitrate. I might, as suggested by Mr. Debenham, have stated what the "wide limits" were. Unfortunately, it is some years since the experiments on which I based my statement were made, and I have not kept any notes of them. I can therefore only say that the limits were the very widest within which I ever worked in practice, and that with the quantities mentioned above, the quantity of gelatine might probably be varied from thirty grains to 600 grains without altering the saturation point. I remember that my experiments were prompted by a remark made by Mr. A. Cowan, that he had recently emulsified with the whole quantity of the gelatine, and had been surprised to find a very large proportion of the bromide of silver at the bottom of the vessel in which he had emulsified.

With regard to remarks by Mr. S. Davies, I am not prepared to say that the addition of chrome alum to an emulsion actually causes it to flow more easily on the plates, but, if the quantities that I mention be not ex-



ceded, it certainly does not interfere with the flowing. The addition of the small quantity of ammonia mentioned—about one minim to each ounce of emulsion—improves the flowing properties to a very great extent.

W. K. BURTON.

### AN ANCIENT LENS.

SIR,—Last night, by the kindness of Mr. W. Flinders Petrie, of the Egyptian Exploration Fund, I had the pleasure of showing at the Photographic Club, what is believed to be the most ancient known lens of which the glass is sufficiently clear to allow of examination, and thinking some particulars about it might interest your readers, I have the pleasure of sending them to you.

The lens was found this year in the Fayum, about sixty miles south of Cairo, Egypt (Fayum being the site of Lake Moeris, and meaning Great Lake), at a place called Hawara (a modern form of the old Egyptian word meaning the great house, i.e., the labyrinth) in a cemetery discovered by Mr. Petrie, whence also came those beautiful and curious portrait paintings, fresh and bright in colour, disinterred by this gentleman, and exhibited in the extraordinary collection at the Egyptian Hall.

The lens referred to is plano-convex, the convex side having somewhat a parabolic form; it has evidently been ground and polished in a lathe. The greatest diameter, it not being a perfect circle, is  $2\frac{3}{16}$ " the smallest  $2\frac{1}{16}$ "; the greatest thickness is  $\frac{1}{8}$  inch. The date of this lens is fixed by Mr. Petrie at about A.D. 150 to 200, and his idea is, that it has been used as a condensing lens, for as the members of the Club saw last night for themselves, it throws a bright beam of light some distance when held about 2" from the flame of a candle. The colour of the glass is somewhat yellow, but it must not be supposed that at the date mentioned white glass could not be made. There are several specimens in the collection of greater age, which are what would even now be called white glass. One I was able to exhibit last night, also another plano-convex lens of much flatter curve, but so altered by age that no examination can be made. Several glass lenses have been found in Egypt before this, one the same size and shape, but eroded, found at Tanis, in Lower Egypt.

I put the lens into a mount, and after some management saw on the focussing screen an imperfect image of window and curtains, leaves of a plant, the pot and marble table; and I think if I had been able to retain the lens a few hours longer I could have got something of an image on a plate, but could not trespass on the great kindness shown by Mr. Petrie in entrusting it to me for so long. To this gentleman I am also indebted for all the proper names, explanations thereof, and dates mentioned in this letter, and I trust you will allow me to thank him for his courtesy and kindness in your columns.—Yours faithfully,

FRANK HAES.

28, Bassett Road, W., July 19th, 1888.

[Our correspondent sends us a same-size photograph of the ancient lens, printed on the new Pizzighelli platinotype paper.]

## Proceedings of Societies.

### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

The monthly technical meeting of this Society was held on Tuesday evening last, the 23rd inst., at the Gallery, Pall Mall East, W. E. DEBENHAM in the chair.

J. P. MONTEFIORE showed some negatives developed with hydrokinone. The formula he used was hydrokinone  $\frac{1}{2}$  of a grain, metabisulphite of potash 1 grain, and carbonate of potash 9 grains, to the ounce of water. The time of development was long—the shortest time in which he had developed a picture with this mixture was ten minutes; and after using for four or five negatives, the solution was still workable, but then took twenty-five minutes to develop the plate. He liked the

developer, both from its not staining the fingers, and for the quality of the negative, in which he thought he got more half-tone than with pyro.

W. M. ASHMAN attributed the abundant half-tone to the long development. As for keeping the fingers free from stain, that was also the case with pyro, if sufficient sulphite of soda, six times the weight of pyro, was used.

A. COWAN remarked a certain yellowness in the edges of the plate where no light had reached it, and had observed this effect to be characteristic of hydrokinone.

W. M. ASHMAN said that the question was, which developer, hydrokinone or pyro, would give a certain amount of detail with the least exposure.

Some diverse expressions of opinion having been given, the Chairman said what was wanted was a series of exact comparative experiments; mere opinions based upon impressions gained without exact experiments might be incorrect and misleading. Some time since a corner of this field of experiment was well worked out by W. K. Burton. He had only professed to work at one corner, but it was very desirable that a more extensive set of experiments should be made, and published, working upon some similar exact method.

W. H. HARRISON said that hydrokinone, unless sublimed, was apt to be contaminated with sulphuric acid and other retarding agents.

A letter from J. R. Gotz was read, enclosing two photographs taken of the same view by himself, one on an ordinary, and one on an orthochromatic plate, both without yellow screen, and calling attention to the fact that by the process with cyanine it had been previously demonstrated that orthochromatic plates might be prepared that were effective under this condition. He added that for developing these plates he used a lamp one side of which was covered with ruby, and one side with orange glass. To commence the development, he put the plate in a dish covered by another dish to keep off all light. After about a minute he lifted the upper dish, and used it to screen off all direct light from the lamp, looking at the plate by what light was reflected from the walls and ceiling of the room only. Further on in development he examined the plate by the direct ruby light, and later still by the orange light. He considered that it would be best to develop altogether in darkness if that could be accomplished.

The CHAIRMAN observed that Ives, in a recent communication, had stated that with cyanine he only got clear pictures when working in darkness. He (the Chairman) thought that as little light as possible should be used, and that probably some such arrangement as the sodium light described in the PHOTOGRAPHIC NEWS of the 13th inst. would be the best for orthochromatic plates.

H. MOBERLEY showed a print on Obernetter's gelatine chloride paper as evidence of the very fine detail that could be obtained upon it, the negative being a small reduction of an ordnance map, and the detail so fine that it could only be seen with a magnifying glass.

Some questions as to toning this paper having been put,

W. M. ASHMAN said that there need be no difference in the toning of albumen and gelatine papers, provided that the emulsion was suitable. It was possible to make an emulsion that would not tone except in a very strong bath, but he had toned many hundreds of gelatine emulsion prints, along with albumen prints, and with equal facility.

The CHAIRMAN suggested that the difference might depend upon the amount of gelatine in which the chloride of silver was suspended.

W. M. ASHMAN replied that that was so, but in order to obtain a high surface it was not necessary that the whole of the gelatine on the paper should be in the state of emulsion. To get such a surface as shown in the prints before them, not less than 40 grains of gelatine to the ounce would be required, but that might be partly as a substratum, and partly contained in the sensitive emulsion used as a second coating to the paper. In this case it was necessary to put the right amount of chrome alum into the substratum, and no more. If there was too much chrome alum in the first coating, the second coating would not take kindly, but would be apt to separate in the subsequent manipulations. As for speed in printing, a gelatine-chloride emulsion paper might be made three times more rapid than albumen paper.

FRIESE GREENE said that an emulsion became much more sensitive when coated thinly and repeatedly upon the plate. He was speaking from his experiments with gelatine bromide emul-



sion, and had found coating the plate six or eight times, that with each fresh coating additional sensitiveness was gained. For developing orthochromatic plates, he had found the best results from using a medium green light to develop by.

The CHAIRMAN suggested that with repeated coatings the emulsion on the plate became repeatedly softened and dried, and this had been asserted to accelerate the speed of emulsions.

A. COWEN said that in the course of so many coatings the plate would probably receive so much light as to amount to what was called a preliminary exposure.

E. COCKING said that he had recently found, when copying a faded yellow photograph, that he had had to give several times the exposure required for one, the paper of which was still white, although in the latter case the blacks were deeper.

The meeting was then adjourned to August 23th.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The usual weekly meeting was held on the 19th inst., W. ASHMAN in the chair.

The CHAIRMAN wished to know whether Mr. Haddon, in his spectroscopic examinations of chlorophyll, had observed the same absorption band in other vegetable extracts.

A. HADDON said a black band was always found in the red, which widened out as the thickness of the solution increased.

J. B. B. WELLINGTON showed several silver prints from two samples of sensitised albumenised paper, the coating of albumen in one case being thinner than the other. This paper toned quicker, and was much the best colour when finished. All the prints were toned together, the borax bath being used. This raised the question whether papers thinly coated with albumen were not the best when commercial paper was used.

The CHAIRMAN said the thicker the layer of albumen, the greater the difficulty would be to get a perfectly satisfactory tone.

A. COWAN remarked that albumenised paper required to be double coated to get a perfectly even surface.

The CHAIRMAN said in double albumenising paper the first coating was coagulated before the second was applied.

P. P. CEMBRANO exhibited a frame of negatives developed with hydrokinone, with varying proportions of potassium and sodium carbonates; he considered that more detail could be obtained in negatives with hydrokinone than with pyro. The potassium carbonate he had found more energetic than the sodium carbonate; he, however, preferred a mixture of the two. Bromide was added to the developer in one or two instances, but it had to be used very sparingly. The negatives, with a table of the various developers used, were passed round for comparison.

#### PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

The minutes of the previous meeting having been signed, the following elections were confirmed:—Through J. Davie, Hon. Local Sec. for Glasgow, W. J. Hogg, Robert Smith, John Percy, Robert Ness, Mrs. Ness, A. Fitz-Conroy, W. Anderson, John Humphrey, Jas. Philson, John Hamilton, W. H. Gemmell, J. G. Mains, Jas. Wilson, A. Adamson, Thos. Gilfillan, H. T. Redwood, John Coutts; through J. B. Payne, Hon. Local Sec. for Newcastle, L. Whitlock, E. F. Grigs, W. Bygate, E. Schumann; also elected, W. E. Shreeve, London. H. M. Smith, 20, John William Street, Huddersfield, elected Hon. Local Sec., *vice* W. M. Ashman, who had left the district. J. J. Briginshaw was appointed as representative of the Association at the Photographic Convention.

#### BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The ordinary meeting of the above Society was held in the Technical Schools, Bridge Street, on the 19th inst., W. J. HARRISON in the chair.

There was a large attendance of members.

J. W. Turner and J. S. Williams were elected members; C. H. Palethorpe nominated for election.

The pictures taken on the June excursion were handed in, and the Judges (Messrs. Collier, Whitlock, and Harold Baker) subsequently awarded the prize to "Lux" (Cottages at Broome). On opening the sealed envelope, the exhibitor was found to be Mr. Harrison.

A. E. UNDERWOOD then delivered his paper on "Photographic Optics," an explanatory paper for beginners (see page 473).

## Talk in the Studio.

THE CONVENTION AT BIRMINGHAM.—Several papers of some interest have been presented to this gathering, making it somewhat more than a mere holiday gathering of the members and their friends.

AMATEUR PHOTOGRAPHIC ASSOCIATION.—At the annual meeting of the Council, held on July 20th at 12, Old Bond Street, the following members were elected:—Sir. J. Whittaker Ellis, R. H. C. Harrison, Henry Champion, J. E. Foster, F. G. Smart, Mrs. E. T. Dawbeny, F. H. Tauner, J. C. Clarke, and Dr. F. B. Scott. The Hon Secretary (Arthur J. Melhuish) then laid before the meeting the pictures for the current year; and the following prizes were awarded:—To R. O. Milne, the first prize, consisting of a large silver goblet, for Nos. 16, 35, and 39; to F. S. Schwabe, a silver goblet, for Nos. 2, 4, and 7; to Mrs. Hobson, a silver goblet, for Nos. 53, 55, and 65; to W. Gaddum, a silver goblet, for Nos. 41, 42, and 94; to R. Leventhorpe, a painting in frame, for Nos. 171, 172, and 173; to W. S. Hobson, a large landscape album, for Nos. 342, 346, and 357; to M. de Dechy, a handsome portrait album, for Nos. 2, 3, and 4; to Dr. Drew, a small silver goblet, for Nos. 2 and 6; to R. Murray, a large landscape album, for Nos. 232 and 238; and to F. Gowan, a handsome portrait album, for Nos. 2 and 3. Certificates of honourable mention were awarded to L. Ashburner, W. Vanner, F. H. Shaw, General Kaye, L. F. Reichling, J. C. Cohen, C. F. Pritchard, J. E. Foster, A. Mulholland, and Miss Jane Wilson.

PHOTOGRAPHIC CLUB.—The subject for discussion on August 1st will be "The Best Method of Obtaining Density on Plates giving Thin Images." Bank Holiday outing at Chesham; a brake will meet the members at Rickmansworth; train leaves Baker Street at 9.59. Saturday outing at Highgate, starting from near St. Joseph's Retreat.

## To Correspondents.

\*. Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER AND CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

FRANK STUTCLIFFE.—If the design is registerable, a mere drawing (in this case a section) is all that will be required.

PHOTARGUS.—1. Using the larger size lens would amount merely to including a narrower angle of view in it, making no difference whatever as regards the other points. 2. Dissolve two drachms of bitumen (Judean pitch) in one ounce of benzole, and add a dozen drops of thick oil of turpentine—that is to say, oil of turpentine which has been exposed to the air until quite viscous. 3. The book is out of print, but a second-hand copy can be had now and then.

MEDIANT.—Your treatment at the hands of the firm in question is discreditable in the extreme, and the attempts to evade responsibility because the injurious mounts were supplied thirteen months ago, is not a plea which should avail them. Obtain the refused case from the Railway Company, as it is important that you should be able to demonstrate the quality of the mounts. Our reporter shall be at the Court when the case comes on.

COLONEL.—We have seen them in the shop of Rouch, Strand, and believe that several other dealers keep them.

ARMY.—All would depend on the abilities of the youth; but unless he has very special qualification to recommend him, his chance will be very small.

STREET.—In such an obstinate case, perhaps the best thing would be to use alum instead of salt; but less will serve; say one ounce to each half gallon.

B. L. M.—1. It is purely a question of private arrangement between you and the other party, and not knowing all the circumstances, we cannot make any suggestion. 2. The paper is so unequal in texture as to be totally unfit for the purpose. If you dip a sheet into water, and quickly withdraw it, the inequality will be obvious. In most cases the quality of first importance in a photographic paper is that all parts shall absorb liquids with equal facility. 3. Write to the Secretary and ask for a prospectus.

J. L. AND R. SAMPSON.—We are of opinion that no risk is involved; still you should investigate the matter for yourselves, as we may be mistaken.

CHARLES FIRMAN.—The firm in question does not manufacture lenses, but only sells those of other makers.



# THE PHOTOGRAPHIC NEWS.

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### THE PHOTOGRAPHIC CONVENTION.

LAST week, in referring to the Photographic Convention, we indicated the fact of papers of some interest having been read. The Convention came to a close on Saturday last, and it was arranged that the next meeting should be held in London, Andrew Pringle being the President for the coming year. As before, J. J. Briginshaw is Secretary, and the Treasurer is S. G. R. Wollaston. Among the papers may be mentioned that of Thomas Bedding, on the Negative Image, which we print in full on p. 491; that of C. H. Bothamley, on Orthochromatic Photography; Marston Moore, on the New Platinotype (see p. 496); Jaffé, on Negatives for Photo-Lithography and Surface-Block Printing (p. 493); Warner, on Stereoscopic Slides (p. 496); and perhaps the most practically useful of all, a communication of G. Whatmough Webster, in which he once more insists on the value of the carbonate of soda method for the preservation of sensitized paper. Indeed, if the Convention should prove the means of inducing numerous photographic publications to again give publicity to the experience of Mr. Webster in this direction, it will have done useful service.

Mr. Webster says:—

So little has the subject been noticed of late, that I am quite prepared to believe that some of the members here present, whose patronage of photography has not been very protracted, may now hear of it for the first time. Take a pound of ordinary washing soda, and dissolve in two quarts of water; by using boiling water the dissolution is facilitated. When cold, sheets of blotting paper are dipped into it, slightly drained, and then piled in a heap with alternate sheets of dry blotting paper, the object of this addition being to permit just the right amount of liquid to be retained that will enable the paper to be readily handled, thoroughly wet porous paper falling to pieces as soon as it is lifted. Next, the paper is hung in a current of air till dry, then thoroughly exsiccated at the fire or in an oven, and stored away for future use. This we may call "soda paper." It may be employed either for preserving paper to be kept some time before being printed, or to keep prints a good colour which may have to be kept in the frame over a day. For the former purpose the dried, sensitised, albumenised, paper is either rolled up with soda-paper, or otherwise kept in close contact with it, as, for example, by placing alternate layers of soda paper and sensitized paper in a printing frame, and pressing down as though a print upon a negative were in progress. For keeping paper white while printing for one, two, three, or more days in the hottest weather, all that is necessary is to substitute soda paper for the ordinary felt pad. Any one who has not yet tried the soda pads, and will only once attempt their use, will be surprised as pleased at the remarkable difference in colour that will be seen between paper so treated and that printed under the usual conditions, when it has been in the frame for a few days. In hot weather the one exhibits very little discolouration, while the other is absolutely useless for any but the crudest of results. I have tried both monosodic and disodic carbonates in the pure, as also in commercial quali-

ties; but the common washing soda of commerce answers every purpose.

Among the papers having a strong tinge of commercialism about them may be mentioned one by William Bishop, on Magnesium Light, in which the history of the magnesium light for photography is made to culminate in apparatus sold by Marion and Co.; and a long discourse by B. J. Edwards.

### PATENTS.

It has frequently been a matter of discussion whether the system of granting monopolies to inventors or discoverers, known under the name of patents, is, on the whole, an advantage to the community in which the system is in operation, or is not. On the one hand is urged the desirability of the stimulus to inventive labour, which the hope of pecuniary reward supplies; whilst, on the other hand, it is argued that manufactures languish from the fact that those in whose hands the monopoly resides are frequently not those who have the administrative or other ability which is necessary to ensure a flourishing trade, occupying many hands in its carrying out. Above the question of general benefit to the community, comes in the question of justice to the individual, who is entitled to a reward for the labour of his mind and hands in perfecting an invention which will turn eventually to the general advantage; and this feeling has in most countries settled the question in favour of a patent law, giving an inventor a monopoly for a certain number of years in exchange for an eventual free public right to it.

As to the inherent justice of some method of permitting an inventor to reap a reward for his labour or genius, there will not be much dispute. On the other hand, the granting of monopolies in the form of patents to persons who cannot fairly be considered to be entitled to such exclusive privileges, and the manner in which such monopolies are sometimes worked, afford a fair ground for argument as to whether, on the whole, more real injustice is not caused by the patent laws as at present existing, than would result from the absence of such laws altogether.

The field of discovery is an open one, and may be compared to land which it is free to anyone to occupy and enjoy the fruits. The person who fences round a portion of this field, by so doing excludes the rest of the community from that portion; which in the case of an invention so-called, may be of so obvious a character, that under the newly-arisen conditions which indicated its desirability, many probably would have hit upon the same method and enjoyed the use of it in common. To give any one person, under these circumstances, the right, for any lengthened period, to exclude others from using an obvious system, is clearly an injustice to the community at large.



The manner, too, in which patent rights have often been worked, is one which is very detrimental to the general interest, and might be prevented by better laws. We have in mind, particularly, a method which was at one time worked pretty largely amongst photographers. We refer to the system of exclusive licences for certain localities. A plausible traveller calls on a photographer in a town, and persuades him that by acquiring an exclusive right to some patented process, he will get such an advantage over his neighbours, that he will be able to obtain a monopoly of the photographic business of that town. Cupidity and fear being roused, the hope of crushing a rival in business settles the matter, and the photographer pays his money in expectation of great results. Fortunately, it happens that, for the most part, the "inventions" thus palmed off upon photographers have not been of such value as to seriously affect the "excluded" professionals. But, supposing that there were an invention of real merit, sufficient to enable its possessor in any town to command the business of that town, and that it was disposed of in this way by a system of exclusive licenses, is it not obvious that the welfare of the general body demands that a less oppressive manner of working it, such, for instance, as a compulsory license at a fair rate, should be the manner having legal sanction?

It rarely happens that any important invention is due to any one man. There is a general idea floating about of a something wanted. One discoverer furnishes a part; another improves upon it, and furnishes another part. One, perhaps, who has worked least upon it, and only furnished some one point which required but very little labour or research, after its want had been indicated by those who have gone before, steps in, and, by patent, obtains for himself alone the reward which should justly be divided amongst many. An invention may often be said to be the result of the time rather than of the individual who appropriates the profit or renown.

It is a common thing for a patentee, when his patent is running out, to obtain a fresh patent for some improvement or variation of the original invention. By so doing an idea is kept up that the patent is still running, although of course, if the original patent was valuable, it is competent for any one, upon its expiration, to make free use of it. That, indeed, is part of the original contract, which the patentee makes with the State in consideration of the monopoly which is granted him for a certain number of years. We call to mind an instance of an endeavour of this kind to maintain a monopoly after the original patent had lapsed. The purchasers of a patent for a particular method of printing had also acquired a later patent for some variation of, or improvement in, this method. Another firm, upon the expiration of the first patent, took up the commercial production of prints upon this plan, and there was nothing, so far as we are aware, to show that the second patent had been used at all. The patentees, however, threatened the customers of the firm producing the prints, and in one very important case the customer, not choosing to run the risk of legal proceedings, discontinued having the work. In one case, a person whom they sent a lawyer's letter, replied that he had such an unaccountable aversion to a correspondence with a legal firm, that he would ask them to make any further communication to his own lawyer, whose address he gave. He heard nothing further of the matter, and we believe that the patentees never ventured directly to legally attack the actual producers, but contented themselves with threats directed to their customers. An amendment of the law requiring proceedings to be taken against the principals, when these are responsible persons, before attacking their customers, would seem to be desirable.

## PHOTOGRAPHIC GRIEVANCES IN CANADA.

### WHAT THE OTHER SIDE SAYS.

In June last we gave some particulars as to the arrangements of the fiscal department of Canada with regard to

dry plates, and we published the complaint of the *Toronto Mail*. We now publish a letter on the other side of the question.

Along with the letter we receive a magnificent collection of Canadian views, and some fine portrait and group work: also a number of the Stanley plates. The series of 18 by 22 inch photographs sell at \$2.50 each, and comprise about fifty notable Canadian landscapes, while the 8 by 10 size is wider in its range, including nearly a thousand photographs, not only landscapes, but subjects of architectural and industrial interest. Notman's portrait and group work is exceptionally fine.

*The Editor of the PHOTOGRAPHIC NEWS, London, England.*

Dear Sir,—Referring to an article in your issue of 8th June, headed "Photographic Grievances in Canada," and copying an article from the *Toronto Mail*, we think it only fair to you and to your readers that you should know the other side of the question.

For many years plates have been made by Canadian makers, some by photographers to supply their own requirements, others to supply the trade. Up to the end of 1884 we manufactured our own plates for use here in Montreal and at our branches. In the fall of 1884 the Stanley dry plates were taking a very prominent place in the market of the United States, and we had them carefully tried at our United States branches, and found them so satisfactory that we resolved to give up making plates, and made arrangements with the Stanley Dry Plate Company to supply us. Those for our own use and sale in Canada we had to import, paying a duty of 30 per cent. on the United States prices. We found them so well received and appreciated throughout Canada that it naturally suggested itself to us that if we could induce the Stanley Company to start a factory in Montreal it would be much to our advantage and to photographers in general; and after a very careful inspection of the several points required to insure success, principally whether the market was large enough to go on coating without interruption, this being especially necessary in the manufacture of the Stanley plate, as they coat by machinery. And as the market and consumption throughout the Dominion was found to be very limited, this seemed the most risky part of the undertaking, and it was evident that every precaution would have to be taken to prevent this market being made a slaughtering one; this is sometimes done to get rid of over-production at times in other markets, and sometimes, we are sorry to say, it is done to kill off any new enterprise in a young and rising country like Canada, and therefore application was made to the Government to change the tariff from a 30 per cent. *ad valorem* to a specific duty of 15 cents per square foot. But we fail to see wherein the action taken has been any real cause of grievance to the photographers of Canada. Prior to the starting of the Stanley Dry Plate Factory, fully two-thirds of the plates imported were from the United States, paying a duty of 30 per cent., and now plates second to none in quality are supplied at the United States prices, and no duty to pay. Instead of a grievance, we consider—and think you will agree with us—that it is a very substantial advantage to them. We herewith send you our circular issued to the trade (marked A), which gives the prices which prevailed until the early part of 1887, when the first plates were issued to the trade from the Canadian Stanley Factory, and we also send you a list of prices charged since then (marked B). A reference to the two tells the whole story.

We send you a few specimens of the work made on the Canadian Stanley Plate, from which you can draw your own inference, and we also send you a few dozen of the plates which you may try in your own laboratory. We may also state that duty has to be paid on the chemicals, glass, &c., used in the production of the plates—notably 30 per cent. on the glass—which is an important item.

Yours truly,  
Montreal, July 16th.

WILLIAM NOTMAN & SON.

## PHOTO-MECHANICAL PRINTING.

BY D. WINSTANLEY.

THE numerous examples of photo-typographic printing which the readers of the *PHOTOGRAPHIC NEWS* have had placed before them clearly demonstrate two facts—the one that it is quite possible, by such processes as are now in use, to render half-tones by photo-mechanical means, in



aggregations of dots which appropriately vary in their number or their size; and the other that these results are produced with great uncertainty.

The theory of the subject as thus far published to the world is manifestly deficient, or manifestly wrong. It does not account clearly for the results obtained, and, as a guide, it does not suffice for their certain reproduction. I doubt very much if the true theory of photo-mechanical printing in opaque inks is known at all, even to those who get the best results, for their descriptions of the processes they employ do not account for the quality of the prints they obtain with moderate frequency, nor do the specifications of their patents claim that which is really essential; they do not deal with the "pith and marrow of the attribute," but only with the "limbs and outward flourishes."

On page 338 of his recently-published and excellent work on photographic and photo-mechanical printing, Mr. W. K. Burton says: "It is difficult to account by any theory for the fact that the mere breaking-up of an image by introducing a grain gives the effect of half-tone by a process in which any one point must be represented by either black or white; and probably," he continues, "the success of the process depends on certain factors—diffraction of light, perhaps, for example—which have not yet been considered in connection with it. At any rate, we have nothing to do but accept thankfully the fact that the result is a very fair representation of half-tone."

*Apropos* of the grained screen used as far back as 1866 by Messrs Bullock, Mr. Burton says (same page): "The only thing in the way of a novelty which has been introduced is the modification of Meisenbach, who introduces an arrangement whereby the grained screen, during the exposure for the reproduction of the final negative from the transparent positive and this screen, is slightly moved once or oftener, so as to still further break up the grain. At first sight it would appear that such a movement was the one thing necessary to make the reproduction of half-tone as black and white grain absolutely hopeless; but here, again, if we can judge by some of the effects obtained by the Meisenbach process, theoretical reasoning is at fault."

On page 21 we have it that "the truth would appear to be that in the case of all the processes" (photo-mechanical ones) "excepting that of Waterhouse . . . a discriminating grain has been produced rather by accident than by the design of the inventor."

On page 20 we find that "the firm of Goupil et Cie have long been famous for the remarkably fine photo-engravings they produce," but that "the precise process used has been kept secret."

On page 21, however, Mr. Burton makes an observation which shows he has a vague notion as to what it is which causes a discriminating grain to be produced when an undiscriminating grained screen is photographed in conjunction with a transparency for the final negative. He says: "It was pointed out in the case of Talbot's improved process how a discriminating grain was produced by the lateral action of the etching fluid. Besides this there is to be taken into account the results of what has been termed the 'creeping action of light.' This is in reality a lateral action of light. When light acts on a film of any appreciable thickness, the action tends to spread sideways to a less or greater amount, according to the intensity of the light or the time that it is allowed to act." This "lateral action of the light" Mr. Burton then endeavours to explain by reference to a woodcut, and by an argument which I respectfully submit entirely fails, and then (on page 22) he suggests that "there may be a slight spreading action of the ink itself" in printing. "Thus," he continues, "if two lines be engraved or etched on a copper plate, both of the same width, but one considerably deeper than the other, the deeper line may print out broader than the other."

From these quotations it is evident that Mr. Burton

(and we have not many who are better authorities) agrees substantially with my proposition that "the theory of the subject as thus far published to the world is manifestly deficient or manifestly wrong." It is evident also that he is not well satisfied with his own hypothesis of the "lateral action of the light," and both these points are rendered more evident as he proceeds further in his book. On page 22 (the page immediately following that on which the "lateral action hypothesis is propounded) he says: "It must be confessed that it is very difficult to see how the result is brought about." And on page 28 this opinion is reiterated with some emphasis. He there says: "Of all these processes" (the stippled screen ones), "the same thing may be said. It is very difficult to see how they succeed at all. At first sight it would appear that they ought to fail, because, considering that a block can only, at one point, print quite black or quite white, it is difficult to see how any half tone is to be got from a pattern consisting of dots of equal size at equal distances, or of lines of equal breadth at equal distances. There is nothing in all this of the nature of a discriminating grain. Still the processes are more or less successful." I have a considerable number of Meisenbach productions before me as I write, and the following words of Mr. Burton's (page 29) are accurately descriptive of them: "If one of these be examined by the aid of a powerful magnifier, it will be found that the image in reality consists of equidistant dots. In the highest lights these are, of course, quite absent; but in all other parts they are present. In the lightest shades, however, they are represented by the minutest points, whereas in the shadow they are so large as to run into each other."

Having thus described these points, Mr. Burton again reverts to the "creeping action of the light," but he is sufficiently dissatisfied with that singular form of action to express a doubt as to the prints being really obtained by the method described in connection with them—a method by which, in his opinion, that action or some other akin to it is involved.

These are the words he uses: "Meisenbach really produces the excellent result that he obtains by the method that he patented, one can only conclude that the discriminating grain results from the 'creeping action of light already treated of.'"

My object in the present article is to show that the Meisenbach results may be obtained by the process Meisenbach as it has been described, that they are not the results of any "creeping action" or any "lateral action" of the light, that the claims made by Meisenbach in the specification of this patent, and which are substantially for the movement of his granulated or stippled screen, do not touch the pith and marrow of the attribute, but merely add to the tediousness of its limbs and outward flourishes. It is my purpose to point out a clear and rational theory of grain discriminating, to show how it comes to pass that there is at present so much uncertainty in the production of satisfactory results, to show how that uncertainty may be avoided, and to pave the way for a vastly extended area of usefulness for the processes of photo-mechanical printing.

It was my fortune to be in the service of the late Mr. Walter Woodbury some twenty odd years ago, *i.e.*, in the early days of the beautiful process which now bears his name. At the time I speak of, none of the Woodbury reliefs were sharp. They were produced beyond the focus of the condenser of a heliostatic camera by the operation of the solar rays. Mr. Woodbury was in the habit of describing the solar rays as "parallel," and he accounted for the "bluntness" of his reliefs by what I then described as the "superstition" that there is such a thing as the "creeping or lateral action of the light." Now, if it were a fact that light did "creep laterally," as the acid used in etching a plate creeps, and if it were further a fact that "the action tends to spread sideways to a less or greater amount according to the intensity of the light, or the time that it



is allowed to act," it would also be a fact that the effect of the stippled or granulated screen would be to produce the gelatine picture in a series of points with their bases towards the negative, which is contrary to Mr. Burton's reasoning on his page 21, contrary to the diagram used to make his reasoning clear, and contrary to the fact as evidenced by the prints. Let the two thick black lines in figure 1 represent a plate of metal, and the space which



Fig. 1.

separates them a hole which has been drilled therethrough. Also let the space beneath represent the bichromated gelatine film. Let us suppose the metal side of this combination to be exposed to light. Clearly the light will be most intense immediately beneath the hole, and least intense at the opposite side of the gelatine film, and accordingly any lateral action there might be, any action "tending to spread sideways," would be most intense just beneath the hole, and grow less intense as the distance from the hole increased, with one of the results shown in fig. 2. A



Fig. 2.

truncated point of insoluble gelatine would be produced with its base towards the exposure surface, and the sides of this point would be straight or curved, and if curved, be inwards or outwards accordingly to the quantitative relations of the "action sideways." The clearer the portion of the negative operated on, the deeper would be the points, and the wider would be their bases, and the result of a piece of shading would be analogous to what is seen in fig. 3., in which the heavy black lines show the opacity of



Fig. 3.

the granulating screen, and the shaded spaces bounded by the thin lines the gelatine rendered insoluble by the direct action of the light and by its hypothetical creeping sideways.

This result is the opposite of what Mr. Burton expected to get. It is substantially the reverse of what is shown in the diagram on his 21st page, and it is analogous to the configuration assumed by the pointed wires used in the process Winstanley, as described in the PHOTOGRAPHIC NEWS on the 19th of October, 1866, over twenty-one years ago. It is, however, not the result desired in the process Meisenbach, or any others in which grained screens are used, and it is not the result obtained by them, but its antithesis. The hypothesis that there is a "creeping action of the light," a "lateral action working sideways," is, so far as my knowledge goes, unsupported by any evidence. Truly, light may be refracted, reflected, dispersed, or diffused by suitable means, but in the instance of a film of gelatine mixed merely with a salt of chromic acid I fail to see these means.

I am quite aware that in the case of carbon printing the "insolubilising" action started in the light is continued in the dark. It was to this action that my friend, the late and unfortunate Mr. William Batho (who died in India just when his worldly prospects were, for the first, good), gave the infelicitous name of "the continuing action of the light"; but I am not aware that even this action is one which has a proclivity for acting "sideways," though

I should not be surprised to learn that in this instance such an action is a fact.

What does take place, however, in the case of the process Meisenbach, in the case of the process Mosstype, in the case of the process Bemrose, and in the case of every process in which grained screens are used, is this: when the negative, with its film beneath, is exposed to the diffused light of day, the rays passing through the various optical apertures which constitute the grain naturally diverge beyond, and produce in insoluble gelatine, a series of cones with their points, and not their bases, towards the negative and granulator side, as seen in fig. 4, and thus give us, when the washing from behind has been effected, a picture consisting of dots, equal in number on equal areas, but differing in size in proportion to the lights and shades of



Fig. 4.

the photographic negative employed, the dots being largest where the glass is clearest, and where, consequently, the light has penetrated to the greatest depth, and the divergence of its rays been most wide. Here, obviously, the broad ends of the cones will touch, and give continuous blackness in the print.

Obviously, the angular divergence of the penetrating rays will increase with the apparent magnitude of the source of light by which the printing is effected, and with a wide angle of illumination the gelatine reliefs will be more shallow, and on that ground more difficult to print from. On the other hand, a narrow angle of illumination will give a deeper relief, but a more undulating surface. The undulating surface is a theoretical objection. The shallow relief is a practical one, and probably the happiest mean would be attained when the angle of illumination is from 40° to 60° in magnitude.

(To be continued.)

## Reviews.

THE INTERNATIONAL ANNUAL OF ANTHONY'S PHOTOGRAPHIC BULLETIN. Edited by A. H. Elliott and W. J. Harrison. (New York: E. and H. T. Anthony, 591, Broadway; and London: H. Greenwood, 2, York Street, Covent Garden). Crown octavo, paper cover. Price 2s.

WE have here a volume which, as regards general get-up, is modelled on the English annuals which appear at Christmas; but though containing rather less information, it is rather more bulky, leaded type being used.

The articles are on the whole useful, and there is a good deal of excellent matter taken from the established English annuals, sometimes, we are sorry to say, without acknowledgment.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

LINOGRAPHY—ENLARGEMENTS ON CANVAS—EXPRESSTYPE—NEW REFLECTOR AND LIGHTING ARRANGEMENT FOR MAGNESIUM LAMPS—POCKET CAMERA.

*LinoGRAPHY; the Production of Enlargements on Canvas.*—The demand for enlargements on canvas seems to be a greater one in this country than in any other, for we have here some establishments by which this branch of photography is carried out on a very large scale; I only mention the well known firm of Brothers Winter, of Vienna, whose enlargements, worked up in brown or sepia, find a very large sale among dealers. These enlargements, or linographs as they are called here, are designed to serve as a base for oil paintings, especially for por-



traits. For small pictures shirting is used, for larger ones rough linen. At the last meeting of the Society for the Advancement of Photography, at Frankfort, Herr Franz Mueller gave a very clear description of this process. Above all, he said, the canvas must be thoroughly washed out to free it from the starch dressing with which it has been provided. The German canvas is preferred to the English material, as the latter seems to contain too much fatty matter. Before the preparation the material must be thoroughly dry. The preparation is effected in narrow trays whose length corresponds to the width of the picture. The shirting is dipped into the liquid, and at once drawn out at the other end over a stout glass rod, which is held over the bath. The bromizing liquid consists of—

Water ... ..	720 c.c.
Bromide of potassium ...	10 grammes
Bromide cadmium ... ..	3 "

After the shirting has been prepared with this solution, it is again well dried, and then sensitized in the following solution—

Water... ..	730 c.c.
Nitrate of silver ... ..	15 grammes
Citric acid ... ..	5 "

If these two salts are well pulverized in a pounding dish and then shaken up with the water until the solution has been effected, there will be no deposit. As to the exposure, it should be a shorter one than is usually given in the case of salted paper; *i.e.*, there should not as much of the picture be visible if the exposure is interrupted, as with the latter; only the deepest shadows should be visible, the half tones slightly indicated. The pictures are developed with the following solution, which should be warmed up to a temperature of about 87½ F. :—

Water ... ..	720 c.c.
Pyrogalllic acid ... ..	2 grammes
Citric acid ... ..	5 "

If the exposure has been correct, the development will be finished in about eight minutes. The toning is done in a bath consisting of :

Water ... ..	600 c.c.
Sulphocyanide of potassium ...	10 grammes
Gold and potassium chloride (1 per cent. solution) ...	8 to 10 drops.

The fixing bath is used in a strength of 1 : 12 to 1 : 8. The final washing of the canvas picture is done in a regular washing machine, in which they are systematically worked for some time; after being stretched upon a frame, they become smooth again. In this state they represent a rather rough appearance, by reason of the tiny fibres which stand erect all over the surface. To lay these, a semi-fluid mass of wax dissolved in turpentine is, in a warm room, rubbed into them; then they are varnished with mastic varnish. The only drawback which has attended the linographs hitherto was their subsequent fading, which was caused by the mass of wax; consequently, instead of the wax, gelatine is now employed, by which the pictures are prevented from fading. Little knots which may appear on the picture after drying are polished with pumice stone, when it will be ready for being retouched. Retouching in black is done with Prussian blue, lake, sometimes also with a little vermilion. The colours are ground up with a mixture of half part of poppy oil, one part of siccativ, and one part of varnish. The bleached oils are to be rejected, as they afterwards again take their yellowish colour, and therefore alter the effect of the picture. After the retouching has been completed, and the pictures are quite dry again, they are once more varnished with mastic varnish.

*Express-type.*—A new photo-mechanical process is announced by Mr. W. Cronenberg, of Grönenbach, under the name of "express-type." It has been invented by the chemist Franz Schradvogel, and is said to be the simplest

and cheapest of all similar processes, so that every printer, with its aid, is enabled himself to produce all zinc blocks he may require. It is quite independent, says Mr. Cronenberg, of the use of the very expensive grained or stippled glass screens, producing a spontaneous grain directly on the zinc plate, from the largest size to the finest grain of a collotype plate. A polished zinc plate is provided with any grain corresponding to the character of the picture, which grain is produced in half a minute; then the zinc plate is coated with a very sensitive gum, chromate film, exposed under a negative one to ten minutes, developed with water, dried, dusted with resin powder, and etched. These are the outlines of the process, which is taught by Mr. Cronenberg for a fee of £15. The proofs I have hitherto seen of the new process lead to the conclusion that it is a very useful one if no artistic result is required—*i.e.*, for usual work—and for the reproduction of line-drawings or engravings. I do not doubt that the process can be improved, and that it will, sooner or later, be also better suited for the finer reproductions in half-tones.

*A New Reflector and Lighting-Arrangement for Magnesium Lamps.*—Herr Fr. Diel, of Cologne, has constructed a double reflector for magnesium lamps, which has the advantage that it allows an intense illumination of large surfaces at very short distances. It is well known to the photographic operator that, whilst he has generally to do with the parallel rays of daylight, the rays emanating from a magnesium lamp are distributed fan-shaped on the sub-

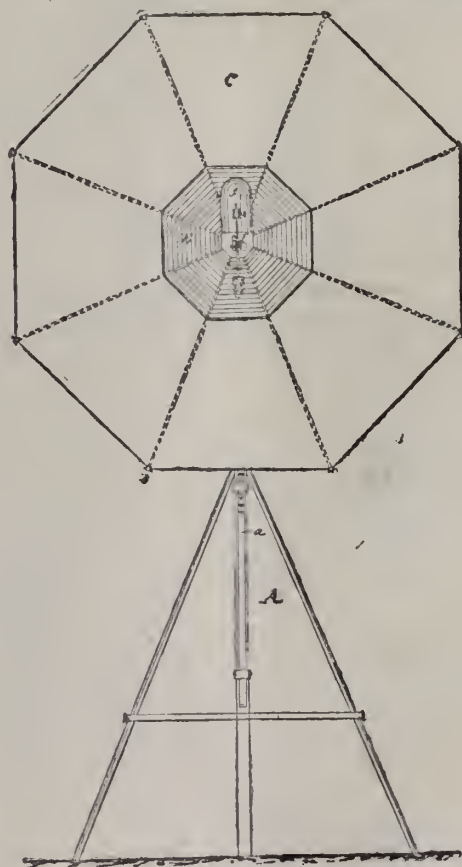


Fig. 1.

ject. It was therefore necessary, if large surfaces were to be illuminated, to place the lamp very far off the subject, which, however, was not at all convenient, and sometimes—as, for instance, in galleries—even impossible. The new double reflector of M. Diel will therefore be welcome to many operators. I give here three sketches of the arrangement, figure 1 being the front view, figure 2 the profile,



and figure 3 the lamp itself, side view. It consists of a brass star *D* (fig. 2) into the radial sockets

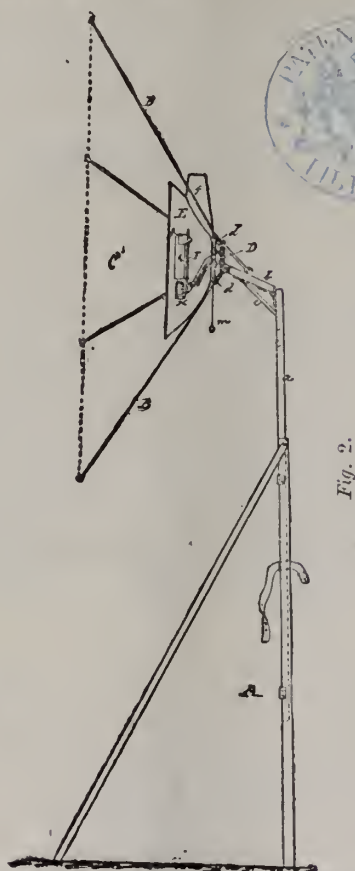


Fig. 2.

of which (d) the screen-sticks, *B*, are inserted ; to the ends

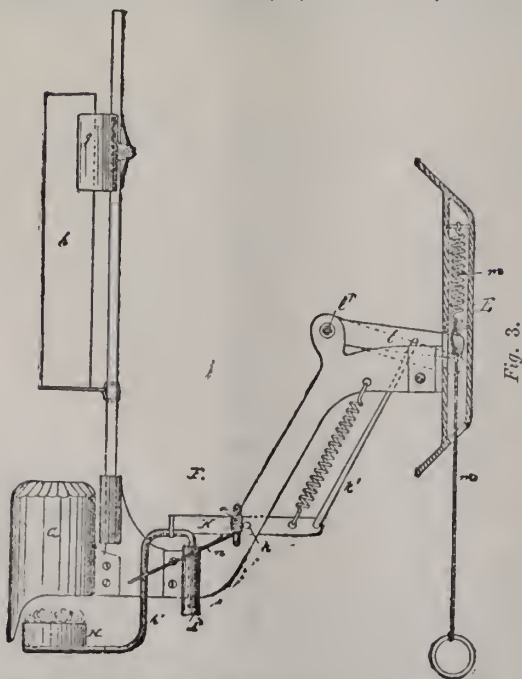


Fig. 3.

of these sticks hooks are attached, in which a white screen, *c* (of linen, for instance) is hung pyramidally by rings. Inside

this screen is inserted the silvered reflector, *E* (fig. 1), with the magnesium lamp, *F*. In this lamp are put between little metal plates, *g* (fig. 3), by aid of a clamp screw, several strips of magnesium band, *h*, which are held over the burner, *G*. Below the latter a cup, *H*, is fixed for a spirit flame, which, by aid of a spring, *n*, can be pushed in a lateral position. To take a photograph, at first two, three, or four strips of magnesium band are fixed in the adjustable clamps, *g*, then the laterally displaced cup, *H*, is ignited, and, after focussing, the spring of the arm, *K*, released by drawing the cord, *m*, hanging down from the back of the reflector, *E*. This causes the cup, *H*, shooting under the burner, *G*, whereby the magnesium band is ignited. Two or three strips of magnesium band of 5 inches length each will burn about nine seconds. In a similar manner also magnesium powder can be burnt with this arrangement. The whole double reflector is fixed as a tripod stand, *A*, and can be adjusted in any angle, and upwards as well as downwards and horizontally.

*Gaertig's Camera "Unicum."*—Much may be said against the cheap forms of cameras, but notwithstanding they prove useful in the hands of many persons. There are hundreds of skilled amateurs, who really enjoy our art, enthusiastically devoting themselves to it, but who would, perhaps, never have been enabled to practise photography if they had had to pay about £10 for their apparatus. I pre-suppose, of course, that the camera in question is good value for the small price charged, so that it gives pictures in which the amateur may find satisfaction. Of this cheap form especially two constructions are in great favour in this country—namely, the "book camera" of Dr. Krugeuer, and Gaertig's pocket camera "Unicum." With the latter I have taken a series of photographs, portraits as well as views, and I must confess that I was surprised with the results. The pictures, having the size of  $4\frac{1}{2}$  by  $3\frac{1}{2}$  inches, are quite sharp, so that they can be easily enlarged, and as the lens is provided with an instantaneous shutter, the camera may be also employed as a sort of detective apparatus. It has parallel leather bellows, and rack and pinion focus arrangement. A novel feature of this little camera is the peculiar construction of the tripod-stands. They are very firm and rigid, and can be employed, when out of use, partly as real sticks, and partly as an umbrella.

## LAW FOR PHOTOGRAPHERS.

BY S. J. DEBENHAM, SOLICITOR.

### CHAPTER VIII.—BUSINESS TRANSACTIONS (continued).

I PROPOSE making a few more remarks as to the liability of bailees for hire, *i.e.*, workpeople, carriers, &c. As it is impossible to meet every imaginable case that may arise, readers must judge by analogy.

I have used the word bailee. The expression denotes one to whom goods are entrusted by another. The act of so entrusting them is called a bailment.

Bailment, therefore, is the delivery of something for a specified purpose, on an undertaking on the part of the bailee to conform to the requirements of the trust imposed on him. Bailments are of three kinds :—

- A, for the benefit of the bailor ;
- B, for the benefit of the bailee only ;
- C, for the benefit of both parties.

The liability of the bailee varies according to the class to which the bailment belongs. In the first case he is liable only for gross negligence.

In the second, he is liable to the strictest care. As an example, if I lend a man my horse, or carriage, or the like, he is liable to the same extent as a carrier, whose liability is as stringent and strict as it can well be, as I have before explained.

Class C does not impart so strict a liability.

I will give an example or two.

Coggs v. Bernard is the old leading case under class A



in which case, indeed, the law was definitely laid down. Here the defendant undertook without reward to raise certain casks of brandy from a cellar, and safely and securely to lay them down in another cellar, and the plaintiff alleged that this had been done negligently, that one of the casks was staved, and a great quantity of brandy spilt. The decision was to the effect that a gratuitous bailee was liable only for gross negligence, having received no compensation for his services; but if he possessed skill he was bound to use it.

In *Clarke v. Earnshaw*, the plaintiff having a valuable chronometer, entrusted it to the defendant for repair. The latter allowed his servant to sleep in the shop where it was deposited. The servant stole it; the defendant was held liable for its value.

A mere accident, however, which results in loss or damage to a chattel, and which was not preventable, does not create liability of the bailee; but the burden of proof is on the latter to show that this was the true cause of the injury.

I have said that a carrier's liability is absolute except as qualified by the acts of Parliament I referred to. Where, however, the owner of cattle, disregarding what he knew to be the usual course of business of a railway company, permitted them to be delivered to a servant of the company at one of their stations without getting an acknowledgment from the proper officer that the cattle had been received for the purpose of being carried, it was held that the company was not responsible for their non-delivery.

If a package belonging to a passenger by railway be put under the seat of the carriage in which he travels by one of the company's servants, that is a sufficient delivery to the company to make them liable as carriers for the loss of the parcel, and has thus even been held that where a passenger took openly and notoriously into the carriage in which he was about to travel an article of value which he deposited there, and took no further note of, the company were liable for the loss, on the ground that goods are held to have been delivered to a carrier when they have been placed in his hands in the ordinary way in which he consents to receive them.

If it be the duty of the consignee of goods to fetch them away from the company's premises, and he neglect to do so within a reasonable time, their extreme liability as carriers ceases, and they are not responsible except for negligence. Three days has been held to be too long a delay (*Chapman v. Great Western Railway*). This exoneration does not arise as to the time goods are on the premises before actual conveyance.

Carriers are not responsible for delay in the delivery of goods where such delay is occasioned by causes beyond their control.

A condition that the carrier shall not be liable for leakage or breakage only exempts him from such if it be the result of accident, and not if it be caused by any negligence or want of care on his part.

Any contract to limit the liability of a carrier must be signed by the customer, or the person delivering the goods; therefore, a mere printed notice on a time-table will not suffice.

And no railway or canal company can limit their liability as carriers by any notice, condition, or declaration made or given to avoid such liability, except such notices as are given under the Carriers' Act 11 Geo. IV., and 1 W. IV. c 86). This was decided in the case of *Simons v. Great Western Railway Company*.

Even a bye-law made by a railway company under the provisions of their special act purporting to limit their liability for loss in certain cases will not, if it contravene the Carriers' Acts, bind the customer, though there be evidence that he had notice of it.

I lately advised in the PHOTOGRAPHIC NEWS on a case where a photographer had taken negatives for a firm of manufacturers on an agreement that a large number should

be done; and less than half this number having been taken, and the customer having for two months failed to provide subjects, the photographer gave up the work, and took a situation at a distance. The customer then demanded possession of the negatives taken, and threatened legal proceedings.

I was of opinion that not only could the negatives be retained, but the customer could be sued for breach of contract, as, although there was no contract in writing, money had been paid on account.

Inasmuch as the negatives only were to be taken, and not printed, by the photographer, they would belong to the customer, if the workman had been paid. But, as I understood the case, he had only been paid money on account. A workman is entitled to a lien on (that is, to detain) a thing on which he has expended time and work, until his claim for payment is satisfied.

The question of the photographer's right to detain negatives was discussed last year in the *British Journal of Photography*, and a long correspondence took place in the columns of that journal on the subject. It was raised by my brother, Mr. Arthur Debenham, of Ryde, from whom a sitter had demanded a negative, threatening proceedings on refusal.

The matter was ultimately settled by the sitter paying a small sum, when the negative was given up.

Many persons seemed to think that whatever the photographer's legal rights might be, it was an ungenerous thing to refuse to give up the negative to the sitter; and might be, indeed, bad policy, disobliging, and injurious to the photographer's reputation.

This, of course, is a question which does not fall within my province to discuss. My business is limited to the consideration of the legal position.

My opinion is that the negative is the property of the photographer. In the correspondence above referred to, many reasons are given for this view of the case, some cogent, others not so obvious. I do not know that the question has ever been tried; but I can see no argument in favour of the customer. I consider he has no right to require the negative.

I have said that a workman is entitled to a lien on an article handed to him for his work upon it. I will explain this more fully. "A workman, who has bestowed labour and skill in the improvement of a chattel bailed (entrusted) to him, has a lien thereon for the remuneration due to him, whether the amount was fixed by the express agreement of the parties or not." And where a chattel is delivered to a workman, under a contract to perform certain work thereon at an entire price, and before the work is completed the order is countermanded, he has a lien on the chattel for the price of work actually done. The lien attaches on chattels delivered to him in different panels, and at different times, provided the work was done under one entire agreement.

This lien, however, does not include or confer a right to sell the article which is the subject of it.

The lien is forfeited by abandoning possession of the article. In fact, of course, there can be no lien if there be nothing on which the lien can operate; but I mean that if possession be resumed the lien is gone.

## Notes.

In the Monthly Bulletin of the French Photographic Society, M. Thouronde discusses the effect of placing a sheet of glass in front of a flexible film in the camera. Such rays as strike the glass vertically are in no way deflected, but oblique rays being refracted cause a sensible disturbance in the image, and in fine work the marginal focus is often lengthened. To reduce the inconveniences



of the glass to a minimum, Thouronde suggests that when glass must be used, it should be as thin as possible, and in focussing that a corresponding glass should be placed close against the inside surface (the ground side) of the focussing screen. Wide-angle lenses should obviously be avoided if practicable.

Ballooning and photographic work have been so intimately associated of late, that each step in aeronautics is of interest to the photographer; but the wonderfully successful parachute experiment made on Saturday last has a very special photographic interest, especially from the point of view of the military aeronaut.

Thomas S. Baldwin, a young American athlete, ascended on Saturday from the balloon ground, at the Alexandra Palace, to a height which we estimated at 1,500 feet, when he let go of the balloon, and depended for his descent on a parachute of the simplest kind, a mere dish-shaped piece of silk with edge-cords leading to a common focus, the notable feature being the absence of ribs, hinges, or any mechanism. For about 300 feet the parachute descended with alarming rapidity, when it suddenly inflated and brought the aeronaut up with something like a jerk, after which he slowly descended with the ease and grace of a large bird resting on its wings.

Here we have the parachute reduced to its simplest form, and answering far better than the complex arrangements which have been devised from time to time, while the following experiment shows how easily and safely the military aeronaut might let down the slides containing exposed plates by using a simple parachute. A cambric handkerchief weighing only just over a quarter of an ounce had a thread attached to each corner, and these threads were tied through a hole made in one corner of a quarter-plate slide containing plates, and the slide was thrown from the roof of a high building. The parachute caught the wind about halfway in the fall, and the slide came to the ground without a jar or shake.

Baldwin has arranged to repeat his performance at the Alexandra Palace each Thursday afternoon and each Saturday afternoon, and probably some of our readers may like to expose a plate or two on the descending parachute.

The jury of the Exhibition organised by the Club of Amateur Photographers of Vienna is composed of the following gentlemen:—W. Burger, Dr. Eder, Alfred Baron de Liebig, Aug. Chevalier de Loehr, Fritz Luckhart, Dr. Federico Mallmann, Charles Srna, and O. Volkmer. The Secretary is Charles Srna, No. 1, Stiftgasse, Vienna.

The *Daily News* "Special," who has been doing the Vandaleur evictions lately, gave on Tuesday last a most graphic and realistic account of the way in which an enterprising photographer took a group of evicted tenants,

in whose midst, in order seemingly to give them the necessary self-assurance, and to induce them to look pleasant under the anything but satisfactory circumstances they were in, he had first posed the parish priest, who at once consented to act as a kind of moral head-rest, or rather to take the place of that "broken column" or other studio property on which nervous and backbone-less sitters like to lean. It is not, however, to describe how the photograph was taken that we refer to the incident, but rather to point out how the presence of the photographic operator in the train of the evicting army is yet another proof of an oft-repeated assertion that the photographer, like the schoolmaster, is now abroad. And it was only a fortnight ago, at Wimbledon, that in the course of the matches which decided who the Lawn Tennis champions for the year were to be, that the photographer was again seen to be very much to the fore, securing negatives of the best players as they made their most effective strokes.

So rapidly, indeed, is the camera becoming associated with our daily doings that we have, in our more sanguine moods, visions of the good time coming when a newspaper editor will despatch his photographic reporters as freely as he now sends round his stenographic ditto. The shorthand writer and the journalistic photographer will, in fact, hunt in couples, or, better still, every first-class reporter of the future will carry a camera as well as a note-book, and be, in fact, a photographic operator and a stenographer rolled into one! And in those days the glances and gestures of the orator will be presented to the public along with his polished periods and eloquent peroration. The cricket report will then not only give the runs made by the crack batsman and the wickets taken by that famous bowler, but will also show exactly how certain of the big hits of the one were made, and how certain splendid balls of the other were bowled.

In the "Law Report," too, we shall just read what reply the chief witness made to the most crucial of the cross-examining counsel's queries, and then immediately below see what the facial expression of the chief witness was when he made it.

We feel confident, in short, that the general development of photography to which we look forward will be for the public good; and that is why we are always so ready to point out any incidents tending to show that the day of the camera is coming; and that as years pass by the photographer will take a more and more prominent part in the chronicling of our diurnal doings.

Indeed, the photographer is now considered as indispensable at all public functions. This is all very well for the people interested, but is occasionally a nuisance to the spectators whose faces will not appear in the picture. At the ceremony of unveiling the Jubilee clock at Brighton, the crowd was kept waiting more than ten minutes, while the principal actors were photographed. The Brighton *Daily News* says:—"The performance was



somewhat tedious to onlookers, but the crowd waited very patiently." It is pleasing to know this; at the same time, we think a great improvement would be effected if the "awful pause" which generally accompanies the taking of a photograph on such occasions could be avoided. The operation itself is most tame and uninteresting, especially in these days of pneumatic tubes and instantaneous shutters. It has, in fact, no beginning, no middle, and no end; and the very moment when the crowd feels a languid curiosity is when the photographer puts his head under the focussing cloth. It should be a *sine qua non* that the band play when the photographer is at work. The music would distract the attention of the spectators, and assist in removing the stony expression on the faces of the persons photographed.

The death of Frank Holl is a loss to photographers as well as to artists. There was no painter from whom portrait photographers could learn more, and when he had a good subject he always rose to the occasion. We have not invariably praised Holl's work, but even in his lesser efforts there was much to be admired. Considering the number of portraits he painted, and the high percentage of uninteresting faces which a much sought after portrait painter must have to delineate, not from choice, but from necessity, his successes were much more numerous than might have been anticipated. This fact, however, is a testimony to his great talents.

Dr. George A. Piersol, of Würzburg, discusses, in the last issue of the *American Microscopical Journal*, the respective merits of drawings and photographs in relation to microscopical work. He is inclined to think that the tendency at present is to neglect the pencil, owing to a too implicit reliance on photography. He has come to the conclusion that the most serviceable and satisfactory field of photography lies at the extremes of the table of amplification with very low—20 to 70 diameters; and with very high powers, 500 to 1,500 diameters. Excellent pictures can be made under ordinary magnifications, 200 to 350 diameters, but as a rule the pencil will produce more satisfactory results. The reason is, that with very low or very high powers suitable lenses will reproduce all the planes of tissue necessary, but that in nine times out of ten, this will not be the case with the medium powers.

There is also the difficulty which the photomicrographer has to contend against in the unsatisfactory manner in which photographs, when required for book illustrations, are reproduced. "If," says Dr. Piersol, "the liberality of the publisher places one of the unexceptional processes at his command the investigator may feel confident. Let him, however, be cautious as to where he places his hopes when economy is consulted, for there is nothing more annoying to the worker himself, and more unfortunate for the cause of photomicrography, than the dissemination of those monstrosities whose harsh black and white masses devoid of half tone and detail are supposed to reproduce a really fine negative." We are afraid that Dr. Pier-

sol's caution should not be confined to photomicrographs alone. All who have desired to reproduce photographs have had occasion to mourn the want of "liberality" on the part of the publisher. On the other hand, the publisher mourns the want of a "process" at once cheap and effective, so that the fault is not entirely on his side. So far as the merits of drawing and photography are concerned as applied to the microscope, it would seem to depend upon the judgment, more than anything else, of the microscopist, whether he will use the one or the other.

# ON THE DISC OF CONFUSION AS PRESENT IN PHOTOGRAPHIC OBJECTIVES.

BY J. J. HIGGINS, A.M., M.D.\*

We have next in order, in our consideration of the confusion disc, the

## EQUALITY DISTANCE OF LENSES,

or distance beyond which, with any lens, all objects are in equal focus. This varies not only with lens, decreasing as the focus shortens, but also with change of aperture.

When an eight inch lens and  $f' \frac{8}{100}$  of an inch the distance of object would equal 808 inches for  $-\ominus \Rightarrow = \frac{F_2}{f'} \times F$ .

On full opening the posterior confusion disc equals  $f'$ , and is therefore in magnitude  $\frac{8''}{100}$ .

On reduction of aperture the posterior confusion disc equals  $\frac{A \times f'}{F}$  and consequently for

$\frac{F}{2}$	it would equal	$\frac{4''}{100}$
$\frac{F}{4}$	" "	$\frac{2''}{100}$
$\frac{F}{8}$	" "	only $\frac{1''}{100}$

The knowledge of this distance in the use of the so-called detective or portable camera of the present day is so important and convenient that I append a small table as published in the *British Journal Almanac* for 1887.

Table showing the number of feet beyond which everything is in focus, when " $f$ ", the equivalent focus of lens, is used, the disc of confusion being less than the  $\frac{1}{100}$  of an inch.

Equivalent focus equals.	Stop.									
	$\frac{f}{5}$	$\frac{f}{10}$	$\frac{f}{15}$	$\frac{f}{20}$	$\frac{f}{25}$	$\frac{f}{30}$	$\frac{f}{40}$	$\frac{f}{50}$	$\frac{f}{60}$	
2 inches.	7	3½	2½	2	1½	1½	1	¾	¾	¾
2½ "	10½	5½	3½	3	1½	2	1½	1½	1½	1
3 "	15	8	5	4	3½	3	2	1½	1½	1½
4 "	27	14	9	7	5½	5	3½	3	2½	2½
5 "	46	21	14	11	9	7½	6	4½	4	4
6 "	60	30	20	15½	12½	10½	8	6½	5½	5½
7 "	82	42	27	21	17	14	10½	9	7½	7½
8 "	107	54	36	27	22	19	14	11	10	10
9 "	137	68	45	34	28	23	18	14	12	12
10 "	167	84	56	42	34	30	21	18	15	15
11 "	202	101	67	51	41	37	26	21	18	18
12 "	241	121	80	61	49	41	31	25	21	21
13 "	283	142	94	71	57	48	37	30	25	25
14 "	328	164	109	83	66	56	42	34	29	29
15 "	376	189	125	95	76	64	48	39	33	33

We have then on reduction of aperture to  $\frac{F}{8}$  a posterior confusion disc of only  $\frac{1''}{100}$  (in place of  $\frac{8''}{100}$  as present on

\* Continued from page 396.



full opening) for objects in the far distance whose focus would be at  $F$ , an amount of blurring considered insufficient to detract from general effect, whence the following

Formula.

The equality distance or distance beyond which all objects are in sufficient focus with any lens of whatever focus or aperture.

$$\left\{ \begin{array}{l} \frac{A \times F}{1} + F \\ \text{or its equivalent} \\ (A \times F \times 100) + F \end{array} \right\} = \frac{1}{100}$$

Dependent in every way upon the confusion disc, but at the same time entirely antithetical thereto, is that quality of such great value in lenses termed

#### DEPTH OF FOCUS,

in the analysis of which we find two forms or varieties are present, viz., a *distal*, and an *interior or proximal depth of focus*. And first, to determine "the depth of focus of a lens for an object behind or beyond the object focussed on," or to use a more ready and convenient phraseology, the *distal depth of focus*. From previous demonstrations it is evident that the difference between the  $f'$  of object focussed on and that of the more distant object must be such as to give only a posterior confusion disc of the more distant object of only  $\frac{1''}{100}$ . On full opening

we found in last example " $f''$ " =  $\frac{8''}{100}$  and the posterior confusion disc to be of equal size. Increasing and decreasing *pro rata* with each other, the new " $f''$ " which we will designate as " $f''$ " would be  $\frac{1''}{100}$  less i. e.,  $\frac{7''}{100}$ . With  $\frac{F}{2}$  we have the posterior confusion disc of only half the size of " $f''$ ", and therefore " $f''$ " would be  $\frac{2''}{100}$  less or  $\frac{6''}{100}$ . With  $\frac{F}{4}$  we likewise see that the posterior confusion disc is one quarter the size of " $f''$ ", and consequently " $f''$ "  $\frac{4''}{100}$  less, or only  $\frac{4''}{100}$ . From which the

Formula.

Distal depth of focus in any lens of whatever focus for any aperture or distance of object equals,—having first obtained the value of " $f''$ " for such distance.\*

$$\left\{ \begin{array}{l} \frac{F^2}{100} - \left( \frac{1}{100} \times "n" \right) \\ \text{less the given distance.} \end{array} \right\} = \frac{F^2}{100} + F$$

In the case given of an 8 inch lens and distance of object focussed on 808 inches, " $f''$ " as we have seen would be  $\frac{8''}{100}$ , and with  $\frac{F}{2}$  the distance of further object would be 1074 inches, and the distal depth of focus (1074—808) 266 inches.†

When  $\frac{F}{4}$  the distance of further object would be 1608 inches, and the distal depth of focus (1608—808) 800 inches. Here evidently the distal depth of focus increases with or on reduction of aperture nearly as the square, being almost four times instead of twice as great.

Take, however, the same lens with like difference of aperture for one-half the distance, viz., 404 inches. " $f''$ " now equals  $\frac{16''}{99}$ . The required distance for  $\frac{F}{2}$  will now be found to be

$$* \quad f' = \frac{-\Theta \rightarrow \times F}{-\Theta \rightarrow - F} - F.$$

Proceeding is as follows: Obtain value of denominator (which will be fractional) and reverse its terms. Then multiply the numerator by  $E^2$  and divide the product by the denominator; to the quotient add  $F$ .

$$\left\{ \begin{array}{l} F^2 = 64 \\ f' = \frac{8''}{100} \\ "n" = 2 \end{array} \right\} \quad \frac{64}{100 - \left( \frac{1}{100} \times 2 \right)} = \frac{6}{100}$$

Reverse denominator and we have

$$\frac{100 \times 64}{6} = 1066 + 8 (F) = 1074 \text{ inches.}$$

$$1074 - 808 = 266 \text{ inches.}$$

460 inches, and *distal depth of focus* (460—404) 56 inches; and for  $\frac{F}{4}$  534 inches, and *distal depth of focus* (534—404) 130 inches. The increase in this case is only very slightly over twice, demonstrating beyond question that no rule as to the ratio of the depth of focus in a lens to its aperture can be given except with the distance of object taken as a factor.

For the determination, secondly, of the *proximal depth of focus*—i. e., the distance of a still nearer object than that focussed on such nearer object to have only an anterior confusion disc of  $\frac{1''}{100}$ , the proceeding is different. Let it be remembered that the ground glass in this case is not at " $F$ " the focus of the lens for the far distance, but at " $f$ " the focus of a nearer object. The mistake must be guarded against therefore of using the anterior confusion disc =  $\frac{A \times f}{f}$ , for this equation applies

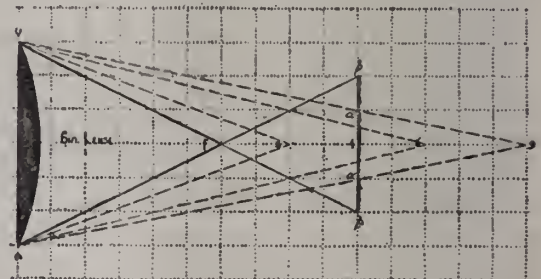
to the anterior confusion disc, of, indeed, a nearer object whose focus is at " $f$ ", the ground glass of camera however being at  $F$ . Here the anterior disc to be determined is that of a still nearer object than the one focussed on with the ground glass at  $f$ , the focus of whose image would be yet more distant from lens. By diagram 10 it is seen that the triangles produced by the anterior confusion disc with varying distances from " $F$ " for their focal point or apex, e. g., 2, 6, and 9 (i. e., for different distances of object) are not, as in the case of the posterior confusion disc, similar, and therefore cannot be compared.\*

With ground glass at  $p p$ , the anterior confusion disc of a still nearer object whose focus would be at 9 is required. Such anterior confusion disc is represented in diagram by  $a' a'$ . Now the triangles  $O 9 O$  and  $a' 9 a'$  are similar, and  $O O : F + 9 :: a' a' : (F + 9) - (F + f')$ . Let the second term be known as  $f^a$ . In the last term,  $(F + f')$  equals  $f$ , and the proportion becomes,  $O O : f^a :: a' a' : f^a - f$ , and

$$a' a' = \frac{(f^a - f) \times O O}{f^a} = \frac{(15 - 10) \times 6}{15} = 2 \text{ inches, as seen.}$$

$f^a$  is here known; when unknown it must for solution be previously found, and the equation from the given proportion therefore would be  $f^a = \frac{(f^a - f) \times O O}{a' a'}$  with  $f^a$  the unknown quantity present in both of its members. But by the

DIAGRAM 10



Proximal Depth of Focus.

rules for Algebraic formula we can change the proportion to

$f^a : f^a - f :: O O : a' a'$  and then at once determine the value of  $f^a$  by

$$f^a = \frac{f \times O O}{O O - a' a'}$$

and substituting  $A$  (aperture) for  $O$  (opening) gives us

$$f^a = \frac{f \times A}{A - a' a'}$$

Formula.

The distance from camera of a nearer object than the one focussed on, said object to have a given size of anterior confusion disc with any lens of whatever focus or aperture.

$$\left\{ \begin{array}{l} \text{The distance from camera of a nearer object} \\ \text{than the one focussed on, said object to} \\ \text{have a given size of anterior confusion disc} \\ \text{with any lens of whatever focus or aperture.} \end{array} \right\} = \frac{F^2}{f^a - F} + F$$

\*  $O 2 O$ ,  $O 4 O$ ,  $O 6 O$ , and  $O 9 O$ , all differ in size of angle at 2, 4, 6, and 9, and are consequently dissimilar, whereas in Diagram 2, q. v., all the triangles having to do with the posterior confusion disc at whatever distance such disc may be, whether at 1, 2, 3, or 4 inches, have like angles with each other, and again with  $O F O$  are hence similar with like ratios.



If now  $a'$  in the determination of  $f^a$  is taken as  $\frac{1''}{100}$  such

formula gives us the distance of the still nearer object whose image would not be sufficiently out of focus to be prejudicial, and the difference between such distances is termed preferably, *the proximal depth of focus, or depth of focus for an object still nearer camera.*

Formula.

The proximal depth of focus in any lens of whatever focus for any aperture or distance of object—having first obtained the value of " $f$ " for such distance.\*

$$f = -I \Rightarrow = \frac{-\Theta \Rightarrow \times F}{-\Theta \Rightarrow - F} = \frac{240 \times 9}{231} = \frac{2160}{231} \text{ and}$$

$$f \times A = \frac{2160 \times 2\frac{3}{4}}{231} = \frac{5940}{231} = \frac{5940 \times 100}{231 \times 274} = \frac{594000}{63294}$$

$$f^a = \frac{A - a' a' = 2\frac{3}{4} - \frac{1}{100} = \frac{274}{100}}{F^2 (81)} = \frac{594000}{63294} - F (9) = \frac{24354}{63294}$$

$$-\Theta \Rightarrow = \frac{81 \times 63294}{24354} = 215$$

and  $215 + F (9) = 224$  inches

which subtracted from 240 leaves 16 inches for the proximal depth of focus.

The above example is taken as used by Dallmeyer in his treatise on lenses, and also by Carey Lea in his text-book, each one, however, giving a different depth of focus. Dallmeyer gives the entire depth of focus as 2 feet 12 inches in front, and 12 inches behind the object. Carey Lea gives the entire depth of focus as 3 feet—18 inches in front, and 18 inches behind object.

The correction by equation makes the proximal depth of focus 16 inches, and as seen by demonstration and diagram the two depths of foci are not equal ever,† *the anterior being in all cases the greater.*

In general terms, the farther the object which is focussed on is from the lens the greater the depth of focus. This is seen at a glance by inspection of examples.

2nd. The less the aperture the greater the depth.

3rd. The corollary—that lenses of long focus have much less depth than those of short focus, and consequently small pictures are always superior to larger ones in sharpness and definition.

4th. That as the depth of focus in a lens is dependent entirely upon its aperture and distance of object, no lens of like focus and aperture can exceed another in this respect, be the maker who it may. In other belongings, *e. g.*, rapidity, definition, flatness of field, &c. (*not forgetting price*), lenses do indeed vary as made by various parties, but no lens of one manufacturer possesses or can possess over a like one of another manufacturer any wonderful depth of focus.

#### SUMMARY OF THE MORE IMPORTANT FORMULÆ.

Symbols.

$F$  = equivalent focus of lens, or distance of ground glass from lens centre, for *parallel rays or objects in the far distance.*

$f$  = focus of image or distance of ground glass from lens centre, for *other than parallel rays.*

$f'$  = their difference  $f - F$ .

$A$  = size of aperture in diaphragm or stop.

" $n$ " = value of the denominator in the expression  $\frac{F}{n}$ , or in

other words, the quotient resulting from dividing the focus of lens by the lineal diameter of stop.

$f^a$  used in the equation for *proximal depth of focus*  $q. v.$

$$* f' = \frac{-\Theta \Rightarrow \times F}{-\Theta \Rightarrow - F} - F$$

$$\dagger f^a = \frac{f \times A}{A - a' a'}$$

the usual value of  $a' a'$  being  $\frac{1''}{100}$ .

*e. g.*, 9 inch lens;  $A$   $2\frac{3}{4}$  inches; distance of object 20 feet = 240 inches.

† The distance from  $f^a$  to  $f$  being always greater than from  $f$  to  $f'$ .

$-I \Rightarrow$  = distance of image or ground glass from lens centre.  
 $-\Theta \Rightarrow$  = distance of object from lens centre.

Size of posterior confusion disc in all lenses of whatever focus or aperture. } =  $\frac{A \times f'}{F}$  or  $\frac{f'}{n}$

Distance of ground glass from  $F$  (equals  $f - F = f'$ ) to have the posterior confusion disc of any given magnitude. } = the required disc  $\times n$

Distance of ground glass from centre of lens to have the posterior confusion disc of any given magnitude. } = (the required disc  $\times n$ ) +  $F$

Size of anterior confusion disc in all lenses of whatever focus or aperture. } =  $\frac{A \times f'}{f}$

The equality distance of a lens or distance at and beyond which all objects are practically in equal focus. } =  $\frac{A \times F}{1} + F$   
 =  $\frac{100}{(A \times F \times 100) + F}$  or its equivalent.

The distance of image—or ground glass—from centre of lens ( $f$ ) for a given distance of object. } =  $\frac{-\Theta \Rightarrow}{-\Theta \Rightarrow - F}$   
 or  $\frac{-\Theta \Rightarrow \times F}{-\Theta \Rightarrow - F}$

The distance of object from centre of lens for a given distance of image from said centre. } =  $\frac{F^2}{f - F} + F$   
 or  $\frac{-I \Rightarrow \times F}{-I \Rightarrow - F}$   
 or again  $\frac{F \times f}{f'}$

The distal depth of focus in any lens of whatever focus, for any aperture or distance of object.\* } =  $f' - \left( \frac{100}{1''} \times n \right) + F$   
 less the given distance

The proximal depth of focus in any lens of whatever focus for any aperture or distance of object.† } =  $\frac{f^2}{f^a - F} = F$   
 the given distance less

#### THE NEGATIVE IMAGE.

[BY THOMAS BEDDING.]

STRAWS prove the direction of the wind, and the constant recurrence of the topic referred to in the title of this paper is an indication that men's minds are never long at rest while a particular problem remains unsolved. The nature of the latent photographic image is still a puzzle, although we are not without theories on the subject—theories the correctness of which has yet to be demonstrated. A recent writer remarks that most photographers feel little concern in the matter, and he appends the conjecture that when the question is finally settled, the knowledge, however interesting to the man of science, will be of small practical value. Herein, doubtless, is some truth and considerable wisdom. Again, it has been sagely said that it is difficult for the common individual to feel deeper curiosity anent the invisible than the wonder "what it is like"; witness the popular indifference to the phenomena of the atmosphere, the forces of nature, &c. As photographers are only human, it is unreasonable

\*  $f'$  for any distance of object

$$= \frac{-\Theta \Rightarrow \times F}{-\Theta \Rightarrow - F} - F$$

$$\dagger f^a = \frac{f \times A}{A - a' a'}$$

the usual value given to  $a' a'$  being the  $\frac{1''}{100}$ .

‡ Communication to the Photographic Convention.



to express surprise at the apathy which most of them exhibit in regard to the invisible chemical changes produced in Ag Br by the rays of light passing through a lens. There may be, nevertheless, a few among them who conceal in their hearts the timid hope that when the mystery of the latent image is at length cleared up, the information thus obtained will be its (the latent image's) own sentence to death, and that the practicability of obtaining a visible negative image in the camera by short exposure only will be forthwith established. To such as these "age cannot wither nor custom stale the infinite variety" of what is commonly considered a dry-as-dust subject, which is at once a justification for approaching it, and a set-off to the contempt of the many.

A film of silver bromide exposed in the camera upon an object in an ordinary room for, say, twelve seconds, undergoes no visible alteration, but upon prolongation of the exposure to as many hours, a very faint picture may be secured; while, if a plate be held in diffused sunlight for a few minutes, the film slowly darkens and gradually acquires a purplish black colour, thus proving that under some conditions the chemical changes undergone by the sensitive salt in presence of light cease to be latent and become visibly active. Such facts are of no value except in so far as they suggest a path for experiment, or induce the attempt to render a sensitive compound as amenable to a brief exposure as are the silver salts to a long one, so that upon the impact of light a negative image becomes visible, and, in order to make it fit for taking positive prints from, requires, we will assume, nothing more than complete reduction to a metallic state, and, possibly, fixation. As an illustration of a chemical compound visibly altered by light to a limited extent, we may cite the case of paper coated with chloroplatinite of potassium and ferric oxalate, which, under a negative, gives a faint image that on the application of one solution acquires almost any degree of intensity. Results as valuable obtained by brief exposure in the camera will not probably be arrived at by any alteration of the present method of conveying the rays of light to the sensitive surface, nor by any attempt to determine whether a very great increase in the sensitiveness of the silver salts will yield a visible image without development. In respect of the rapidity with which exposures may be made, the modern dry plate does not leave much to be wished for, and it is possible that with any large increase of sensitiveness the incurable evil of intrinsic fog would be the rule instead of, as now, the exception. Hence the coming man, who is to acquire both fame and florins by abolishing the necessity for development, borrowing a hint from Professor Carey Lea, will essay to dig deep in the inexhaustible mine of chemical research for a binary compound that possesses properties lacked by Ag Br, for, doubtless, that way the visible photographic image lies, possibly with diminished, probably with slightly increased, exposure.

That there must be enormous difficulties of chemical theory and practice to be surmounted before such a consummation can be recorded it would be rash to question, though such might be considered rather as an incentive to the limited class of experimentalists upon whom photographic progress is dependant; yet, if we concede the soundness of the oft-repeated opinion that photography is only in its infancy, it is surely allowable to anticipate the time when the new and improved dry plate will have unceremoniously swept all the wearisome screeds about the latent image to the limbo of history, settled once and for ever the large question of correct exposure, obviated scientific and every other variety of development, and made photography more than ever what many say it is now, namely, as easy as kiss your hand; the truth of which imputation nobody, not even the most enthusiastic amateur or hardworking professional, will, of course, deny.

#### PHOTOGRAPHIC EXPEDITION TO MOUNT ETNA.

BY VITTORIO SELLA.\*

##### PART II.

EARLY in the morning we started with a strong north wind, but with a clear sky, to mount the Perimial cone. The ascent takes only one hour. We made the ascent from the occidental declivity of the cone. So, leaving the Casa, we turned to the left and crossed a slightly ascending plain, all scorie and blocks of whitish and decomposed lava which were ejected from the great crater during the eruption of 1863. We next attacked the cone itself, and we easily reached through movable lapillos covered by white sublimations, the "North-West" brink of the crater. Thick and

white vapours issued silently but rapidly from the gorge of the crater in huge masses, giving one an indication of the great powers within.

We could not see into the interior; nevertheless, what was visible was a new and grand spectacle to us. The wind blew the vapours with a whirling motion over the opposite (the southern) brink, and produced a beautiful picture. For an observer placed at a certain distance, the sight of the volcano at that moment might have recalled the high summits in the Alps, which sometimes, when a strong wind blows, are surrounded by white and fleeting vapours. The near aspect of the crater is a scene which changes nearly every day, depending on the quantity and quality of the vapours which it exhales, on the state of the atmosphere, &c. If one is fortunate enough to see the crater in a phase of its interior activity, then the scene is very different. Then, during the night especially, that immense gulf (450 metres in diameter nearly) presents a spectacle at once beautiful and frightful. One sees a mass of inflamed lava, in ebullition, going up and down in the deep gorge of the crater, with flames of vivid light, and cracks are heard, during which lava and scorie in the shape of bombs are projected to a considerable height.

The weather was fine, and the rising sun was a wonderful sight; one could admire an immense portion of earth and sea. The Lipari Islands, with the Stromboli, were visible. One could see also Mte. S. Pellegrino, near Palermo. We saw the projection of the triangular shadow of the mountain suspended over the atmosphere which covered the lower regions.

After having taken an instantaneous photograph of the crater, we descend the steep and smoking north declivity of the cone. Afterwards, arrived on the plain, we cross some fields of snow, mingled with rough lava and scorie, and we go on to ascend a spur of volcanic rocks which is called Pta. Lucia, from which one commands the northern side of the terminal cone and the valley of Alcantara, with the great villages of Maletto and Bandazzo. The wind calmed down towards 10 a.m., and enormous cumulus began to rise from the southern declivity of the mountain; they mingled quickly with the white smoke of the crater. In the afternoon we return to the Casa Etnea, turning the cone from the occidental side.

On the following two days we did other different photographic excursions around the great cone, always passing the night comfortably at the Casa Etnea. We found good points for views in the upper part of the Serra delle Concazze—in the lava of 1823, in the Montagnola, &c. To the geologist, a very interesting part of the mountain is the great Valle del Bove, said by geologists to be an ancient and huge crater of the volcano. It is an enormous cleft in the oriental side of the mountain, bounded at the south by the Serra del Solfizio, and at the north by the Serra delle Concazze. These Serre are crests of steep and broken cliffs of volcanic and stratificated rocks. The whole large amphitheatre of the valley forms an area with irregular outlines of about 20 km. in circumference.

It was our intention, after having gone round the higher part, to examine more closely this great cleft in the mountain, and to descend afterwards to the wooded regions, and thence make another tour round the mountain.

The fourth day after having left the hospitable Casa Etnea, early in the morning, instead of descending by the ordinary route that returns to Nicolosi, we move a little to the left side, and from the Montaguola we descend to the edge of the Serra del Solfizio, from where we dominate all the bottom and lower part of the Valle del Bove. The sight was most grand, and the view extended to the mountains of Calabria and to the mountains of Taormina, which descend to the sea in a gentle declivity.

Following the edge of the Serra, we descend lower to a point near the Monte Zoccolaro, from where the great valley is still better seen. Two craters called the Monti Centenari, placed nearly in the centre of the valley, attract our attention. They formed themselves during the great eruption of 1852, which covered nearly all the huge valley with lava. The sight of the whole valley is now arid and desert-like.

Leaving the edge of the above-named Serra we descend in the direction of the Monte Gemellaro, which is still hot and smoking. Seen from close by, this Monte has the aspect of an enormous heap of coke. All around the cone, for the radius of a kilometer and a half, the ground is covered to about half a meter in depth with very fine powdered lava, which fell like rain during the eruption of May 1886.

We returned in the evening to the Casa dal Bosco, so as to undertake during the following days the tour of the mountain in the woody region.

\* Continued from page 475.



This region is very interesting. The geologist Lyell says:—"The most imposing and interesting sight which is to be seen on Mount Etna is the great number of smaller cones rising here and there down its declivity, and in the woody region especially."

The complete tour on foot took four days. Two mules brought our provisions and the covers; the pastors gave us polite hospitality for the night, in their small huts of lava. We ascended Monte Scavo, Monte Maletto, and Monte Spagnolo, points which stand out very well on the Western and North-West declivity of the mountain. The view from these cones of the Valley of Simeto and of Sicily are grand and beautiful. The weather was always fine. The woods alternating with lava produced a curious and artistic contrast. The fresh air and the limpid atmosphere make the way very pleasant. The woods are of four species: pines, oaks, beach trees, birch trees. A strange fact to observe is that these kind of woods are quite distinct and unique. Where the pines grow, flourish neither cork or other trees, streams of lava separate for the most part these woods.

Our tour finished at the village of Zafferana, from where we returned to Catania, much satisfied with our long walk through that woody region of Etna, so little visited, and yet so beautiful and interesting. I recommend it to those who are going to ascend the volcano.

The well-known guide, Pietro Galvagno Nicolosi, who accompanied us on Etna is one of the best companions I ever encountered on a mountain. He knows by name nearly all the little cones of the mountain, and the date of many of its eruptions.

Before leaving Sicily, we visited the celebrated Scoglio dei Ciclopi, which arise from the sea not far from the shore of the small village of Trezza, situated at a distance of an hour from the East of Catania. These "Scogli," or rocks of the Cyclops, are said to be those which the great and famous Cyclop Polyphemus hurled at Ulysses after his escape from the cave. One of these rocks is very picturesque, and composed of columnar basalt in four and eight sided, but not very regular prisms.

The months recommended for ascending Mount Etna are those from June to October. It seems to me that also in winter, when the snow covers it in great part, the ascent of the volcano must be very interesting for an alpinist, especially by moonlight. Those soft and waste declivities, those different woods, that abyss of the crater, which continually smokes, offer, without doubt, a grand and interesting spectacle in winter.

N.B.—Those wishing complete information about Etna should read the works of the Baron S. von Waltershausen, who has given a detailed account of the mount, both geologically and otherwise; of Prof. Silvestri; Carlo Gemellaro; Charles Lyell, &c. I recommend to the climber the "History of the Mountain and of its Eruptions," by W. G. H. Rodwell (London, Kegan Paul and Co.).

## NEGATIVES FOR PHOTO-LITHOGRAPHY AND SURFACE BLOCK PRINTING.

BY MAX JAFFE.\*

1. *Nature of the Original.*—When pen and ink drawings are made expressly for photographic reproduction, care should be taken that all the drawings, even the finest lines and dots, should be pure black. It is further recommended not to use china ink by itself, but to mix with it a certain amount of sepia.

Half-tone drawings intended for reproduction by negative with grain or line should not be too soft and delicate, but powerful and with well-marked contrasts. China ink alone, without sepia, is more suitable for half-tone pictures.

2. *Lighting of the Original.*—For the reproduction of ink drawings or prints for photo-lithography, it is of the first importance that the subject should be lighted as evenly as possible. This is a matter of great difficulty with studios of the ordinary ridge-roof construction. With small surfaces the difficulty is not so great; it, however, increases with the size of the original, and requires careful adjustment of curtains to overcome it. I have described in the *Freie Kunst* a studio† best adapted for the purpose. In this the direction is north and south, and the top light is as steep as possible, and falls low down—facing the north—to the partition which separates the light and dark portions of the studio. As further means of equalising the lighting and of removing the shadows due to the grain of the paper, it is recommended:—(1.) To reflect the top and side lights by means of mirrors. (2.) To stretch a

translucent white material above the drawing. (See my article in "Eder's Annual," 1887.)

3. *Choice of the Lens.*—Any system of double objective (with two pairs of leuses) may be employed, provided that it is—(1.) Free from spherical aberration. (2.) Equal in illumination over the whole of the field included in the image. (3.) Capable by means of small stops of working without astigmatism (loss of sharpness at the edges) so completely that the picture is sharp in the extreme corners. I cannot, however, refrain from stating that in my many years' experience, I have obtained the best results with Steinheil's aplanatic leus. For large sizes especially, I have found Steinheil's wide-angle aplanatic for reproductions most suitable. For lessening the trouble of placing exactly upon the focussing screen, an index attached to the back of the camera is used. (See my papers in Eder's *Annual*, 1887, and *Photographische Correspondenz*, July, 1888.)

4. *Exposure.*—We frequently hear it recommended, by photographers who are not much experienced in photographing from line subjects, to give a short exposure in order to keep the shadows as clear as possible. This proceeding is, however, not the correct one, since with too short an exposure all the lines and points come too wide in the negative. With designs of a purely technical nature this defect is not so striking; but on the other hand, is more so with artistic drawings in which there is light and shade. Of course with a very limited exposure there is nothing to prevent—especially with a much diminished copy and when copying an engraving or drawing that is faint in places—many lines and points from being covered up or lost in the negative. Beware especially not to intensify too much such a negative, otherwise the precipitate spreads and obliterates the weak places, so that the fine lines in the copy will be in parts interrupted and in parts lost. The great intensification, up to complete opacity, recommended in many instruction books, and which may seem correct in theory, is in the rarest cases practicable, and is certainly not necessary, for the tone, which is printed owing to incomplete opacity of the negative, is removed by rubbing during development, provided that the transfer paper is in good order, and is not left more than twenty-four hours after sensitising.

5. *Operations. Methods.*—With all the advantages which the gelatine emulsion process offers, it yet cannot compete with the collodion process when it is a question of preparing a negative to be used in a photo-mechanical or photo-lithographic transfer process. Gelatine plates in general do not give the necessary clearness and sharpness of the design; and though it cannot be denied that by a special preparation of the emulsion and suitable treatment throughout, very clear negatives may be obtained, yet the sharpness is not equal to that which collodion gives.

### Collodion.

Plain collodion at 2 per cent.	... 900 grammes
Alcohol ...	... 100 "
Calcium chloride ...	... 1.6 "
Cadmium bromide ...	... 7.8 "
Ammonium iodide ...	... 4.7 "

This iodizing is in general sufficient. When one has to do with the reproduction of drawings in which there are large white spaces, it is advisable to add more of the iodizing solution—it may even be used in one-third greater proportion. In case the collodion does not work quite clear, a few drops of an alcoholic solution of iodine may be added. In order to obtain as even a film as possible, the collodion is poured on to the plate, and allowed to run first to the right-hand further corner, when the plate is kept for a little while in a horizontal position; the collodion is then run to the left-hand further corner, and the plate again rested. Next it is run to the left-hand lower corner, and once more rested. Finally it is poured off by the right-hand lower corner as rapidly as possible, whilst the plate is rocked through a large arc. In order to obtain still greater evenness of film, the plate is coated a second time with collodion; before the second coating, however, the film must be thoroughly set. For the second coating the collodion should be thinner—the plain collodion made at 1½ per cent.

### Silver Bath.

To one litre of water add 80 grammes of nitrate of silver and sufficient nitric acid to slowly redden blue litmus paper. This reddening should occupy about a minute. When the bath is more acid the collodion film is apt to be loosened, and there is more difficulty in obtaining density in the deposit forming the image.

(To be continued.)

\* A Communication to the Convention.

† A description of Herr Jaffe's studio will be found in the PHOTOGRAPHIC NEWS of the 13th inst., p. 431.—TRANSLATOR.



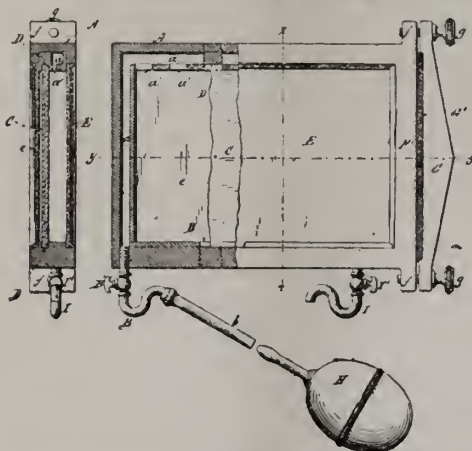
## Patent Intelligence.

### Patents Granted in America.

385,264. THOMAS W. HARVEY, Orange, N. J., for "Portable photographic developing-box."—Filed February 27th, 1888. Serial No. 265,413. (No model).

*Claim.*—1. A portable photographic developing-box, made partly of tinted glass impervious to actinic light, and provided with a tight-fitting removable cover, and with pipe connections for introducing into and withdrawing from the box the liquids used in developing a picture upon a sensitised plate which has previously been exposed in a camera, and after removal therefrom placed in the developing-box.

2. A photographic developing-box, partly made of transparent tinted glass and adapted to contain a photographic plate, and



provided with an internal receiving-chamber, having perforations in its inner wall, for the purpose of effecting the simultaneous discharge upon different portions of the plate under treatment of liquid introduced into the said receiving-chamber by means of a suitable pipe connected therewith.

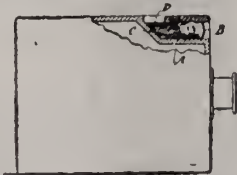
3. A photographic developing-box, made partly of tinted glass, in combination with a pipe for introducing into and withdrawing from the interior of said box the liquid employed in the developing process, and an air passage or pipe for letting air escape from the box when liquid is injected into it, and for permitting air to enter the box when the liquid previously therein contained is withdrawn from it.

4. A photographic developing-box, made partly of tinted glass, and provided with an opening for permitting the introduction into the box of a photographic plate, in combination with a removable cover faced with an elastic material, and a fastening for said cover for securing it to the box, and closing the said opening water-tight after said photographic plate has been introduced into the box.

5. The herein-described photographic developing-box, made partly of tinted glass, substantially as and for the purpose set forth, in combination with the liquid-supply pipe B, provided with the stop-cock B', and the air-pipe I, provided with the stop-cock I'.

335,513. WILLIAM HARKNESS, Fishkill, assignor to The Scovill Manufacturing Company, New York, N.Y., for "Finder for photographic cameras."—Filed December 10th, 1887. Serial No. 257,522. (No model).

*Claim.*—1. A finder for photographic cameras made of glass or like material, and comprising a body portion, a lens at one



end, and an inclined reflecting-surface at the other end, substantially as specified.

2. A finder for photographic cameras, composed of a single piece of glass or like material, and comprising a body portion, a lens, and an inclined reflecting-surface, substantially as specified.

3. A finder for photographic cameras, composed of glass or like material which is rectangular in the cross-section, a lens of corresponding rectangular outline, and an inclined reflecting-surface, substantially as specified.

4. A finder for photographic cameras, composed of glass or like material, and comprising a body portion, a lens at one end, an inclined reflecting-surface at the other end, and a ground-surface above the reflecting-surface, substantially as specified.

385,797. EDGAR E. ELLIS, Rochester, N.Y., assignor of one-half to AUGUST L. LEHNKERING, same place, for "Photographic film."—Filed July 1st, 1888. Serial No. 206,850. (No specimens).

*Claim.*—As a new article of manufacture, a photographic film composed of gun-cotton dissolved in alcohol and ether, resinous gum, gum-campbor, and rubber dissolved in benzole, in proportions substantially as set forth.

386,006. FRANCIS H. FROEDMAN, Dublin, County of Dublin, Ireland, for "A method of manufacturing supports for photographic emulsion."—Filed March 17th, 1887. Serial No. 231,316. (No specimens.) Patented in England Aug. 20, 1886, No. 10,659.

*Claim.*—The process herein described of preparing a base for photographic negatives, the same consisting in forming a sheet of insoluble bichromated gelatine, and decolorizing said sheet by means of sulphurous acid, so as to transmit actinic light for the purpose of printing, substantially as specified.

## Correspondence.

### ORTHOCHROMATIC PHOTOGRAPHY.

SIR,—I learn from the account of the proceedings of the Photographic Society of Great Britain (p. 415), that Dr. Vogel takes exception to my statement that all colour-sensitive gelatine bromide plates should be used with a colour screen. I insist, however, that no rapid gelatine bromide dry plate ever produced will give correct colour values without the use of a colour screen, and any statement that is calculated to produce a contrary impression is misleading. Of course, there are plates that give far better values than ordinary ones do, but I am sure I do right to object to any statement calculated to produce the impression that they give correct colour values.—Very respectfully,

FRED. E. IVES.

907, Filbert Street, Philadelphia, July 17th.

## Proceedings of Societies.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING was held on Thursday, the 26th ult., W. M. ASHMAN in the chair.

H. D. ATKINSON said he had recently been trying to get a suitable light for his dark room, and he was surprised to find so much effect produced upon plates by light filtered through various mediums. In one instance he used daylight filtered through one thickness of ruby fabric, and two of canary medium; a plate was exposed thereto for fifteen minutes at a distance of two feet, and a strongly marked disc was the result; he then tried a similar experiment with artificial light, with a like result.

P. EVERITT found canary medium bleached in time, so that it might be safe at first, but not continue to be so.

H. D. ATKINSON had experienced more fading with golden fabric than canary medium.

W. H. HARRISON considered the employment of fabrics of any kind to be utterly unscientific. All the fabrics he had tested allowed white light to pass freely; the only safe way to examine a medium was by means of a spectroscope.

R. OFFORD noticed that some fabrics showed more of porosity than others, but for practical purposes two or more thicknesses superposed answered very well.

The CHAIRMAN preferred yellow fabric, and plenty it, for of



illuminating the dark room. If there was any doubt about the safety of it, that could be easily settled by keeping the plates at a greater distance from the light. By adopting that precaution, even a porous fabric would do no harm, because the various rays of white light which passed through the medium would intermingle with the coloured rays, and their effect at a distance of a few feet would be practically nil.

W. H. HARRISON thought the proper lines to follow in constructing a safe light was to start with a benzoline spirit flame, or better still, par oil, and transmit the light through glass coated with fluoresceine in albumen; this should in turn be diffused through opal, and then any other coloured glass, which may be desired, placed in front. In his own lamp there were grooves provided for four glass plates. The light should always be at a fixed distance from the mediums, or certainty of result would be impossible, as intensity changes according to the square of distance.

J. H. SIMPSON had recently made a benzoline lamp which gave an admirable light for dark room lamp; it had a brass tube of a  $\frac{1}{4}$  of inch in diameter; this was stopped, and five small holes drilled instead. The tube was packed with cotton wick, and gave an excellent light. The wick lasted a long time before it crusted.

R. ORFORD suggested the use of an asbestos wick, which he believed would, in a benzoline lamp modified like Mr. Simpson's, give the best light yet introduced for dark room lamps.

The CHAIRMAN thought gas was more convenient, if a known capacity burner was used at a fixed distance, and that outside the dark room there was not much trouble about it. The Cowan lamp was next discussed, after which an interesting conversation upon glass-grinding took place.

#### DUKINFIELD PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting was held on Tuesday, July 24th, at the Co-operative Hall; J. T. LEES (Vice-president) occupied the chair, and there was a good attendance of members.

Robert Phipps was elected a member. Reports were given of Rambles to Broadbottom and Bollington.

After some discussion it was decided to give two prizes, one open to all the members, and the other for beginners only, for the best set of six photographs taken on the Society's Rambles.

The Hon. Sec. (W. H. Shirley) read a paper on "The Magesium Flash Light," and several groups were taken with an arrangement kindly provided by the Chairman.

#### LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting was held at the Royal Institution on Thursday, July 26th, B. J. SAYCE in the chair.

Ernest V. Bibby was elected a member of the Association.

The CHAIRMAN read a letter from GEORGE H. RUTTER, Chairman of the Exhibition Sub-committee, stating that a meeting of the Sub-committee had been held on the preceding evening, at which it was arranged that the accounts of the Exhibition should be closed and submitted to the Auditors in time for the next general Council meeting.

The HON. SECRETARY read letters from Paul Lange, sending his shutter for exhibition to the meeting; also from Bernstein and Vogt, enclosing a sample of Dr. Byk's hydroquinone, which he was requested to try and report upon. He also drew attention to the desirability of members wishing to propose candidates for election sending in particulars at least ten days before the meeting.

Dr. G. A. KENYON referred to a condition in the rules for the annual competition, requiring all work to be done during the year preceding the competition, and pointed out the hardship of this as regards enlargements and lantern slides, which were generally most conveniently executed in the winter upon the work of the preceding summer.

It was said in reply that the rule only applied to the actual enlargement or slide, and not to the negatives from which they were made.

Reports were read on the Bangor and Is-y-Coed excursions, in which 21 took part, and 168 exposures were made; on Llangollen at which 9 were present, and 98 exposures made; and on the steamer trip down the river. Work was shown by several members who took part in the excursions; amongst others by Messrs. Bradbury, Lange, Irvin, Lupton, and Sayce.

It was announced that the excursion planned for Bank Holiday would be relinquished.

F. EVANS gave some further notes on "Hydroquinone Develop-

ment," which he considered quite equal to pyro, though, perhaps, a little slower, but for general work giving better results, inasmuch as for an under-exposed plate, hydroquinone would go on developing until all the action by the light had been brought out; whereas, with an over-exposed plate development proceeds sufficiently slowly to give time to remedy the error by judicious alteration of developer. He found that with a normally exposed plate it was two or three minutes before development started with hydroquinone, whilst with pyro it began in forty seconds; the pyro, however, seems to have finished action in about seven minutes and then stops, whilst the hydroquinone progresses very slowly, but continues action for fully forty minutes, development progressing the whole time. He showed several negatives having received similar exposures in pairs, one of each pair developed with pyro, the other with hydroquinone, the latter being generally remarkable for density and clearness, also for their colour and freedom from stain. One negative in particular was exposed at four p.m., with  $\frac{1}{2}$  and shutter about one-quarter of a second; it took forty-five minutes to develop. He recommended the following formula:—

No. 1.—Hydroquinone	...	...	...	...	1 ounce
Sulphite of soda	...	...	...	...	4 ounces
Citric acid	...	...	...	...	$\frac{1}{2}$ ounce
Water	...	...	...	...	32 ounces

Dissolving the hydroquinone and sulphite of soda separately in about 10 ounces each of boiling water, and when cold mixing and making up to thirty-two ounces; this would contain one grain of hydroquinone in half a drachm.

No. 2.—Carbonate of potash	...	...	...	...	$\frac{1}{2}$ ounce
Water	...	...	...	...	1 ounce

To develop, use

No. 1	...	...	...	...	...	1 drachm
No. 2	...	...	...	...	...	2 drachms

And make up with water to two ounces.

The HON. SECRETARY stated that he had made some trials with the hydroquinone developer, using a sample of Dr. Byk's hydroquinone kindly supplied to him by Bernstein and Vogt, with which he was much pleased. It dissolved easily, kept its colour well, and acted well in development.

Dr. KENYON suggested that the solution in spirit should not be much exposed to the air, as he had found it deteriorate. He also thought that, as the solution of hydroquinone with sulphite of soda and alkali appeared to keep very well, it might be possible to use it in a dipping bath with tight cover, and so keep the plate developing a very long time, as a means, possibly, of obtaining good results with very short exposures.

Mr. SAYCE stated that hydroquinone succeeded very well with paper.

Some discussion arose on the keeping properties of sulphite of soda in solution and its tendency to oxidise to sulphate, so acting as a retainer.

The HON. SECRETARY said it oxidised more slowly when in an acid condition.

## Talk in the Studio.

TO PREVENT BUMPING DURING DISTILLATION.—*The American Druggist* says:—"To prevent the annoying, and sometimes dangerous occurrence of bumping which many liquids experience during distillation—which is mainly due to a superheating of the layers of liquid situated immediately over the source of heat—A. Reissmann recommends to introduce into the flasks or retorts spirals of rather thick platinum wire, containing small fragments of pumice. The spirals must be heavy enough to prevent the pumice from floating it. The pumice, thus compelled to sink to the bottom, has the advantage of presenting a large surface to the liquid. E. Daunenbergh recommends asbestos for the same purpose, and thinks it preferable to anything else. W. Markownikow introduces into the liquid to be distilled several small capillary tubes, 0.3 to 1 cm. long, and closed by fusion at one end. The presence of these will cause liquids which are otherwise very refractory to boil regularly and quietly, even under diminished pressure. A few scraps of broken tobacco pipe are often effectual.

PORCELAIN SHOT FOR CLEANING BOTTLES.—Under this name small white globules are made in Munich. They are made to



take the place of ordinary lead shot used for cleaning wine and medicine bottles, as porcelain is entirely free from the objection of producing lead contamination, which is often the result when ordinary shot is used. Their hardness and rough surface, producing, when shaken, greater friction, adapt the porcelain shot well for quickly cleaning dirty and greasy bottles, and as they are not acted upon by acids or alkalies, almost any liquid can be used.—*Rundschau ; Am. Jour. Pharm.*

**JOINT ACTION OF AIR AND LIGHT UPON METAL PLATES.**—MM. Bichat and Blondlot communicate to the Academy of Sciences that if the rays of an arc-light are thrown upon a sheet of brass, and a current of air is directed against it at the same moment, a well-marked electric action is set up.—*Scientific News.*

**PLEA FOR GREATER HEIGHT OF STEREOSCOPIC SLIDES.**—At the Convention, Harding Warner ventilated his well-known views on this subject and said:—"It is just possible that the reason why the stereoscope has not made headway of late years, and then only amongst amateurs who have utilised the pictures as lantern slides, is, that this end served, the negatives are useless for aught else, and this is my plea for an increased vertical height in the slide. This new size may be used for cabinets and birthday and Christmas cards with appropriate mottoes, and for portraits also, and if two be taken together, and marked R. and L., they may be looked at singly or together, and thus form one large cabinet portrait. Nor is the whole-plate or 9 by 7 camera at all altered, only thus far, by having a front made with four brass caps—two covering the stereoscopic flanges when not in use, the others covering two flanges placed top and bottom above the stereoscopic lenses in the centre, the division being reversed, fitting horizontally, and the screen reversible. Two separate and very pretty sized panoramic pictures  $8\frac{1}{4}$  by  $3\frac{1}{4}$  may be obtained, giving an extent and depth to subjects of space and mountainous scenery alike charming and interesting—Norway, for example.

**PIZZIGHELLI'S NEW PLATINUM PROCESS.**—Marston Moore read a paper on this subject at the Convention. He said:—"The commercial preparation of platinum paper in this country has hitherto been a virtual monopoly, closely guarded by several patents. The method of manufacture and manipulation generally practised until recently may be thus briefly described:—A suitably sized paper was coated with a ferric-oxalate solution, in which was dissolved a determined proportion of  $K_2PtCl_6$ . The dried sensitised paper was exposed under a negative, a weak image, consisting of ferrous oxalate, being formed. It was then floated upon a hot solution of potassic oxalate, the faint ferrous image being thereby changed to a black one, caused by the reduction of the platinum salt to a metallic condition. Finally, the picture was treated with a dilute solution of  $HCl$ . This process, of which but a shadowy outline is here given, has enjoyed a high degree of favour for several years past; but at the present moment it is being superseded by a notable modification, which dispenses with the necessity of hot development. It may be thus concisely specified:—The paper is sensitised with a solution of which ferric oxalate is the chief constituent; and after exposure under a negative, the picture is developed with a cold solution containing a platinum salt, and finished in the manner previously indicated. In both these processes the image acquires its final density by development, and it is in this very important detail that they differ from Captain PizzigHELLI's last method, which, in its turn, is a fundamental variation of those described in his monograph, wherein he gives an elaborate exposition of the two processes just roughly sketched. In this last method of PizzigHELLI, the sizing and sensitizing solutions are combined, and, what is still more important to note, a developing agent is also added, so that the reduction of the platinum salt actually takes place during the exposure of the paper in the printing frame. His *modus operandi* has been ascertained to be as follows:—A solution of gelatine, gum mastic, or arrowroot, is first prepared, and then either a solution of ammonia-ferric oxalate or sodium-ferric oxalate, to one of each of which a solution of chloro-platinite of potassium is added. The paper is coated, dried, and stored with the calcium tube as usual. When it is exposed under a negative the printing is carried on until the picture has acquired the exact depth and detail that it is intended it should ultimately have. To this there are two or three alternatives. First, the image is allowed to proceed until it is generally visible, but weak; when the picture is removed from the frame and placed in the dark, and the reduction of the platinous chloride allowed to proceed spontaneously. Instead of the latter plan, development may be

accelerated with a very dilute solution of sodium carbonate. Finally, the printing may be permitted to go as far as in the older platinum process, and developed in the same manner. In either case the print is afterwards immersed in the  $HCl$  solution, allowed to remain therein until the whites are perfectly pure, and afterwards well washed in two or three changes of water. It is important to note that before the paper is placed in the frame, it is advisable to allow it to absorb a little moisture without wetting it, otherwise the printing is considerably slowed, if it is not fatally retarded.

**THE SURVEY OF THE HEAVENS.**—In the House of Commons on Tuesday, the Chancellor of the Exchequer, in reply to Sir H. Roscoe, said that the astronomical instruments for the international photographic survey of the heavens, recommended by the Royal Societies of London and Edinburgh and the Board of Visitors of the Greenwich Observatory, had not yet been ordered by Her Majesty's Government, but the House would soon be asked to vote the necessary amount. Two of the Great Powers—Russia and Austria—had not yet announced their co-operation. There was no reason to believe that Great Britain would be behindhand when the instruments were required.

**A PHOTOGRAPH OF THE CONVENTION.**—From Thos. Scotton, of Derby, we receive an excellent "group of members attending Convention," taken by him on Saturday morning last. There are sixty-six in the group.

**CARDIFF AMATEUR PHOTOGRAPHIC SOCIETY.**—An Exhibition of photographs, photographic apparatus and appliances, will be held at the Assembly Rooms, Town Hall, Cardiff, from the 22nd to the 27th of October, 1888. Fourteen classes open to amateurs, eight classes open to professionals. Champion class open to amateurs and professionals, and a class for the best general collection of apparatus. Gold, silver, and bronze medals and certificates will be awarded. For prospectus and entry forms apply to G. A. Bedford, hon. sec., 127, Bute Road, Cardiff.

**PHOTOGRAPHIC CLUB.**—The subject for discussion on August 8th will be "The Treatment of Plates giving Thin Images." Bank Holiday outing at Chesham; a brake will meet the members at Rickmansworth; train leaves Baker Street at 9.59.

## To Correspondents.

\* \* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER AND CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

**FRANK SUTCLIFFE.**—The registration of a design is not made at Stationers' Hall, but is under the control of a department of the Board of Trade. The procedure is somewhat complicated, and you had better employ a Patent Agent.

**G. F. WYNNE.**—No patent covers the process, consequently no license is required.

**EAST.**—If the photograph is really copyright, its reproduction for sale or profit will bring you within the law. 2. If there is no photographer's name on the mount, we do not see how you can possibly ascertain, unless the present possessors can give you information as to the origin of the photograph.

**LINED MOUNTS.**—Pay a sufficient sum to cover the value of the serviceable mounts, and let the dealer take proceedings to recover the price of those which are not fit for use, by reason of the lines being printed out of the proper position. If he takes proceedings let us know, and we will send a reporter; as the case will have a general interest for photographers.

**W. KIDAWAY.**—There is nothing of the kind which is at the same time quite satisfactory, and very low in price. The stretching arrangement made by the Eastman Company, and used in the ordinary slide, answers well.

**R. C. CLIFFORD.**—The decision is a very common one, and in the case you refer to, the punishment may be regarded as exceptionally lenient.

**R. N. PIMMS.**—It is a very common defect in commercial papers, and much care and watchfulness are needed to avoid it.

**R. THOMPSON.**—1. Use common glue. 2. As far as we can judge, there is no advantage whatever in so doing.

**F. T. BENNETT.**—For adhesive mounts, make rather thin glue and stir in an equal bulk of thin mucilage of gum arabic. Use the preparation warm, and when dry, roll the cards.

**M. ROCHE.**—Ten grains of nitrate of silver in each ounce has always proved sufficient in our hands. Send us fuller details of your mode of working,



# THE PHOTOGRAPHIC NEWS.

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## BLOCK PRINTING AND PHOTO-LITHOGRAPHY.

Of all the departments of photography, that of producing raised blocks suitable for printing along with letter-press is that in which the most evident progress has been made in recent years. We refer to blocks produced from subjects containing gradations of tone, for when it is a question of rendering a copy of a line drawing or of any other subject already in pure black and white, there has been no difficulty in achieving the desired end by processes long known and practised, provided the lines are not exceptionally fine or close. Connected with the block process, in so far as the translation of a half-tone image into one composed of a grain of some kind is concerned, is the process of photo-lithography, which has shared in the advance made in the technical quality of surface blocks; but as its application is so much more circumscribed than that of a method which enables the picture to be printed simultaneously with the letter-press which it may serve to illustrate, the progress of photo-lithography is of less commercial importance than that of block printing.

A few years since it was quite an exception to see a really fine example of block printing from a negative originally in half-tone, and even when such were to be met with, they were not set up along with the printed matter of an ordinary book, but were separately printed, and on a special fine paper. Prints that were made with only ordinary care and set up with type and printed on ordinary paper, were commonly so coarse or smudgy that they could only be interesting from some technical point of view, and were quite unsuited for the pages of works intended to satisfy a critical circle of readers. Now, however, for some time past, papers of such standing as the *Graphic* and the *Illustrated London News* have regularly made use of blocks produced by a photographic method from the half-tone drawings of the artist. Surface block prints from negatives direct from nature have not, so far, been as commonly used, but in this direction their employment is increasing. Every improvement in the process of making the blocks tends to increase the extent of this very important use of a photographic method, and so to increase the sphere of photography. We have great pleasure, therefore, in placing before our readers the substance of a communication with which Dr. Eder has just favoured us, on the subject of the most recent improvements adopted at the Imperial Institute for instruction and research in photographic and reproduction processes in Vienna. The formula for the etching liquid for zinc he tells us we may especially recommend to our readers as being much better than the nitric acid solution hitherto used.

As is well known, the photo-mechanical methods of printing, as well as photography and photo. chemistry, are subjects of instruction at the Imperial Institute, and

although many formulæ for the photo-mechanical processes have been published, on account of their number the choice amongst them becomes difficult, and much time and labour are involved in experiments to determine which are the best. It is on this account very desirable to know of some formulæ which may be relied upon as good, and we have pleasure, therefore, in subjoining those in actual use at the Imperial Institute, of which Dr. Eder is the director.

*Photo-Lithography. Transfer Paper.*—30 grammes of gelatine and 15 c.cm. of glycerine are dissolved in 1,000 grammes of water, and the solution poured upon the paper. One-fourth of the quantity mentioned is sufficient for a sheet measuring 45 by 50 centimetres.

*Sensitizing.*—100 grammes of ordinary bichromate of potash is dissolved in 2,000 c.cm. of water, and liquid ammonia is added until the solution becomes of a pale yellow colour. The transfer paper is immersed in this solution until it becomes quite flexible.

For transfer paper containing albumen, alcohol may with advantage be added to the sensitising bath. The formulæ then reads, 100 grammes of bichromate of potash, 1,600 c.cm. water, 400 c.cm. alcohol, and ammonia as before, until the deep orange colour is replaced by pale yellow.

The paper, after exposure under a negative, is, whilst in the dry condition, inked with a velvet roller, and then, after immersion in cold water, it is developed with a pledget and with the velvet roller. The transfer on to the stone is effected in the usual way.

*Surface Etching on Stone.*—The stone bearing the image from either photo-lithographic or other transfer paper is treated in the usual way, and lightly etched with dilute nitric acid and gum. The whole stone is then covered with powdered resin, and this is rubbed in with a tuft of cotton-wool. Two narrow strips of millboard are then held by an assistant, so that they lie along the sides of the stone, and so that the edges of the millboard rise about 2 or 3 m.m. above its surface. Meanwhile a strip of wood of about 8 centimeters in breadth, and covered with an absorbent cloth, has been moistened with ether. It is now slowly drawn over the surface of the stone, the strips of millboard serving as guides to keep it from touching. By the action of the ether vapour the resin is softened and combined with the ink. The etching may now be completed with a stronger solution of nitric acid and gum than before.

*Etching Liquid for Zinc.*—1,000 c.cm. of water is mixed in a flask with 1,200 grammes of ordinary nitric acid of 40°, 80 grammes of common salt is then added, and when dissolved 300 grammes of "strong" acetic acid is poured in. Red fumes of nitrous acid are given out, and the open flask is left in an airy place for five or six days. There is then no further, or but very slight, evolution of gas, and the acid is ready for use.



The first etching is carried on with acid of from 5° to 6° Baumé, and occupies from five to fifteen minutes. For later etchings the acid may be used of double the strength given, or even more.

## PATENTS.

### SECOND ARTICLE.

In the short article on the subject of patents which appeared in our last week's issue, we were compelled to make but passing reference to one or two aspects of the question, which yet have such an important bearing upon the interests of those engaged in the business of photography, that we think it desirable to go into the matter somewhat more fully now.

A difficulty arises, at starting, in deciding what is the amount of protection that in an ideal patent law should be granted to an inventor. On the one hand, it is urged that if anything is a man's individual property, it is the work of his brain, taking the form of a new invention, and that therefore the invention should be secured to him absolutely to do as he pleases. On the other hand, it is argued that there is no natural or inherent right that should enable anyone to exclude others from working in a similar manner to that in which he works himself simply because he happens to be the first to put a legal fence round that particular mode of action, whilst the probabilities are, that in most cases others, if a little later in point of time, would, by the necessities of the age, have been led to the adoption of the same means as that claimed by the patentee. Above all, comes in the question of the general welfare, and the monopoly accorded by patents being essentially an artificial and state-created property, it is desirable that the granting of this monopoly should be accompanied by such limitations or conditions as shall not be inconsistent with the general welfare, even if confining the word general to the great body of workers in any particular trade or profession.

Against this view it is argued that any great improvement in manufacture is commonly accompanied by distress amongst those engaged in the trade, whose work is superseded by the improvement, but that such distress is more than compensated by the benefit which eventually accrues. Distress arising from the operation of natural law may be endured with what patience and fortitude we can summon up, but when it arises from an artificial or state-created monopoly, worked in such a manner as to be peculiarly oppressive, we naturally look for a remedy or palliation in a form of legislation which, whilst respecting the rights of a real inventor, shall prevent those rights from being used in an unnecessarily oppressive manner; and which shall put a limit upon the practice of what we may call patent snatching, or the obtaining of monopolies for matters of detail of such a character that they would necessarily occur to almost any one in the working of some new art.

To take first the matter of oppressive mode of working patents, and especially the mode of doing this by exclusive licenses for particular localities. Suppose that any really valuable process in photography—such, for instance, as the gelatine emulsion process as now practised—had been patented and worked on the exclusive license method. Do not photographers realise what would be the position, in each particular town, of all but the one individual who had been able to satisfy the demand of the patentees? What could those do who were confined to the slower process of collodion when there was another in possession of so much more rapid a process? As it happens, the discovery of the gelatine process was the work of many minds, and no essential point in it has been patented; but this may not be the case with the next great advance which the future has in store for us, and if worked on the exclusive license system, wide-spread ruin amongst professional photographers must be the result. It happens, also, that in the majority of cases, at all events, in which photo-

graphic patents have been worked on the exclusive license system, it has been the purchasers of these licenses, and not the excluded professionals, who have been the losers. A system of compulsory license, such as was advocated unsuccessfully at the time of the passing of the last Patent Act, would prevent such distress as might arise under the present law, and perhaps when the subject next occupies the attention of Parliament it will receive more favourable attention.

If, however, it is a subject for regret that under the present law the inventor of a valuable process may, by his manner of working it, bring the great majority of the members of the photographic profession to ruin, it is still more galling that such a power may rest not only with a really great discoverer, but with a person who first snatches a patent for some small step in a process, which in its leading features has been worked out previously by others who have presented the fruits of their labours to the public. The particular small step may be a mere adaptation of something previously known, and so obvious a one, that it would naturally occur to many, when once the process with which it is associated receives general attention. Moreover, it sometimes happens that photographers are deterred by threats from using some particular process, or have money extorted from them by the patentee for its use, when in point of fact, as soon as someone has the means and the courage to resist, it is found that the patent has no more legal than equitable claim to be considered valid. In this connection it is interesting to remember that by far the greater number of patents that are taken out would not stand the test of legal action; being invalid or voidable, on the score either of want of novelty, of insufficient detail as to the manner of working, or of making too large claims.

Some years ago, in the collodion era, American photographers underwent the very unpleasant experience of having a demand made upon them by one W. A. Taulinson, as holder of a patent taken out about ten years earlier by J. A. Cutting, for the use of bromides in collodion. As bromides and iodides are salts having such similar characteristics, and as bromine had been used in conjunction with iodine in the Daguerreotype process, it did not require much invention to suggest that bromide should be employed in addition to iodide when collodion took the place in the photographic portrait business that had previously been occupied by Daguerreotype. C. J. Fredericks, of New York, against whom a test suit had been instituted, was advised to settle it by payment of nine hundred dollars, which he did. Other photographers had to follow suit, but it was eventually shown that this "invention" was not even new, but had been published in England about a year before Cutting's patent had been taken out, and it was, therefore, upset. That a patent should be granted for such an obvious adaptation, so that the first one who rushed to the Patent Office to snatch the sole proprietorship of an idea which was probably occupying many minds at the time, should be permitted to exact what terms he pleased from the members of the profession, is certainly not in accordance with the principles of justice. Fortunately, this particular patent was upset. Whether, if it had happened in England, the fact of its being a mere obvious adaptation would have been sufficient to invalidate it independent of previous publication, is a question that we do not undertake to answer; but this we may say, that it is an abuse of the patent system to claim any such monopoly, and that if it is shown that law and justice are not in accordance, it becomes a duty to bring the question forward until they are made so.

## WILSON'S CHAPTER ON RETOUCHING AND DOCTORING THE NEGATIVE.

A TYPICAL complaint is to be found on page 501, in an article by William Heighway, who is discounted because there is not as much original matter as he thinks there



ought to be in "Wilson's Quarter Century of Photography." In passing, we may observe that if writers of photographic books only described methods they had themselves originated, photographic books would be bare indeed; and, moreover, the real literary thief is the man who re-words the matter of others without acknowledging his indebtedness, the writer who quotes and gives the source being the honest compiler. Still, the real purpose of our present article is to present to our readers these portions of Wilson's chapter not given by Mr. Heighway:—

*Coloured Collodion for Retouching and Improving Negatives.*—*Orcanete*, or red collodion, when poured upon the back of the negative, lends itself very rapidly to the manipulations of the retoucher, who can wholly reduce certain limited parts, or by a regular gradation attenuate its non-actinic colouration as his good taste may dictate. Not only can feeble or strong negatives be ameliorated, but even good portrait negatives can be improved by diminishing or augmenting the effects of light on the face, or by rendering details more perceptible in white and light-coloured clothes, dresses, hair, &c.

With landscape negatives it is possible to give better relief and to separate the different planes of the pictures one from another, to bring out with advantage the details of foliage, and to soften the over-strong high-lights; in fact, by this means negatives can be considerably modified, and yet without destroying the resemblance or rendering the effect unnatural. Proofs can be thus printed by which the effects and the different colours of nature are more agreeably interpreted.

In order that the film of *collodion a l'orcane* may be rendered more resistant during the processes of decolouring, recolouring, and scraping, it is advisable to employ a preliminary coating of albumen made as follows:—Take the albumen of three eggs, say 90 c.c., and 75 c.c. of water, well beaten together into a stiff froth; and add 50 c.c. of liquid ammonia; after agitation add a little at a time, 100 c.c. (3 fl. ozs 3 drs.) of sulphuric ether and 50 c.c. (1 fl. oz. 5 drs.) of alcohol at 95°. The larger the quantity of ammonia added the greater is the proportion of ether and alcohol that can be introduced without coagulating the albumen. The ammonia, ether, and alcohol are intended to preserve indefinitely the albumen, to render its application to glass more easy, and also to hasten the desiccation. When the above mixture is freshly made and allowed to settle, a part of the ether separates and rises to the surface; but when reshaken it again mixes, and after some days the ether no longer separates itself, and the whole may be filtered through paper.

The back of the negative is covered either by means of a soft colour brush, or by pouring it on like collodion. This solution of albumen when wet does not attract small particles of dust like simple albumen; and it dries upon a draining-stand in from ten to twenty minutes, according to temperature.

The ethereal tincture of *orcane* is obtained by placing in a wide-mouthed bottle the dry roots of *orcane*, and filling nearly up with sulphuric ether at 62° or 65°. It must then be well corked, and left for one or two days to digest, with agitation from time to time; finally it is left to settle for twelve hours, and may then be filtered through paper into a smaller bottle.

The alcoholic tincture is produced in like manner, employing alcohol at 95° instead of ether.

To prepare the red collodion, take filtered ethereal tincture 100 c.c. (3 fl. oz. 3 drs.), filtered alcoholic tincture 50 c.c. (1 fl. oz. 5 drs.), and low-temperature cotton, 1½ grammes; it is scarcely necessary to say that this collodion may be made lighter in tint by the addition of plain collodion. It is very handy to have three different bottles, one containing a lightly tinted solution, the second a darker one, and the third a saturated solution of *orcane*. Upon the dried preliminary film of albumen the red collodion is flowed as desired.—*French Photographer.*

*Chemical Retouching.*—I have a method to offer, simple, expeditious, and under control, as follows:—After the negative is fixed and washed, flow with a thick solution of albumen, say—

Albumen	...	...	...	...	1 ounce
Water	...	...	...	...	4 ounces

and dry.

When dry, coat with iodized collodion, sensitize in the bath; and to expose, put the plate in the dark slide, or plate-holder reversed, the film uppermost. Place four small pieces of glass at each corner, and gently lay on the pieces of glass a plate the same size as the negative, which will preserve the sensitive film from injury; close the door and expose a few seconds by draw-

ing out the slide in the light. It will be understood, of course, that the sensitive film is on the collodion side of the negative, not on the glass, so that a transparency is printed in close contact. After exposure, develop with the ordinary developer, wash, fix, dry, varnish, and the whole is complete. The transparency on the negative will not need intensifying, and will rarely be too dense by the application of the developer alone; the intensity, however, can be reduced by cyanide of potassium.

Now the advantages of the idea, no matter how carried out, are manifold. Freckles are softened, if not obliterated; scratches and pinholes are mollified, if not "stopped out"; "heavy blacks" are toned down, and shadows softened; the faintest detail in the shadows which otherwise would be lost in printing is increased, preserved, and harmony pervades the whole picture instead of a chalky, freckly, spotty, nudertined thing. All undertimed negatives, or those with heavy shadows, and dense high lights, can be made by the above method to yield passable prints; but remember, O courteous reader, that experience must be acquired ere you meet with unequivocal success.—DAVID DUNCAN.

*Obliterating Opaque Defects in Negatives.*—Certain negatives are rendered apparently worthless by the presence of numerous opaque spots upon the surface.

After various suggestions respecting the reproduction of the negatives through the instrumentality of transparencies, upon which the offending spots would be touched out previous to making use of them for forming printed negatives, the idea occurred to us to dissolve the spots themselves out of the negative, and then to have the transparent holes thus made properly filled by pigment of the same density and colour as the portions immediately surrounding.

The following is the method I follow, and I very strongly recommend it as being at once simple, expeditious, and certain. Take a bit of caustic potash (there is no necessity whatever for weighing it, a piece the size of a bean, greater or less, answering quite well); to this add about an ounce of water, and when it has dissolved, which will be the case in a couple of minutes, add a quantity of methylated alcohol equal to the water present. Now, holding the negative either by one corner, or, as we prefer, upon a pneumatic holder, pour this solution upon the surface, taking care that every portion is covered. Allow it to remain on for about half a minute, pour off into a porcelain or glass measure, and again apply it to the surface, as if it were a developing solution. Pouring off once more, apply to the surface a little plain water with alcohol, and follow this by copious washing with water. When the plate is dried there will not be a vestige of the varnish found on its surface.

If by accident, bad varnish, or inadequate temperature, a negative has been damaged in varnishing, the method just described will prove a most effectual means of denuding the collodion film of its resinous, pellicular coating.

By means of the treatment described, the opaque spots upon the plate are rendered in a proper condition for being operated upon by a solvent. The solvent I use is a somewhat strong solution of iodide in cyanide of potassium, the relative proportions being such as to leave the solvent salt in excess. This is easily effected by adding iodine until the cyanide solution is incapable of dissolving more, and then making a further addition of cyanide. The mechanical conditions are secured by the addition of a few drops of mucilage of gum-arabic.

The negative having been placed upon the retouching-desk, and a tolerably strong magnifier utilized, a camel's hair brush, charged with the solution described, is deftly applied to each opaque spot, which, after a few seconds, is seen to become quite transparent. When the whole of the spots have been touched in this manner, a gentle stream of water is applied to the film, so as to clear away all the solution of iodine. The spots previously opaque, but now transparent, are next touched in by means of an appropriate pigment to be selected from the colour-box, a mixture of burnt sienna, Prussian blue, and China ink, forming a pigment which answers every purpose.

The negative treated in this manner yields points which do not demand any artistic operation, and in which it is almost impossible to discover any fault indicating there having been at one time something seriously amiss with the negative.—W. P. BOLTON.

Take a penknife with a small, pointed blade, sharpen the point well, and with it, using a magnifying glass, you can remove, by scraping, small opaque spots on gelatine negatives, when dry. You can also modify or remove an objectionable light in the eye, or any little defect of that kind. Your first trials will pro-



bably be failures, but practice will show you the proper shape of blade needed. Of course, care and patience are essential to success, but it can be done.

Retouch on the gelatine film by grinding with resin, fine pumice-stone, or any of the methods in use; coat with plain collodion, and when dry and hard, coat with good varnish; when hard, grind again carefully, and retouch off those black freckles or moles that you could not fill up on the first film, and soften those heavy lines about the eyes and mouth that would not "yield" on the gelatine, and that stray lock of hair that refused to "budge" before can now be made to vanish. Scan the whole work over, and put on the finishing touches, and you will be pleased with the result.

Clean the back of your negatives before printing with dry pumice-stone (powdered), using the ball of the finger; perhaps a knife will be needed to scrape the largest gelatine stains or spots that may happen to be there, but the pumice-stone will make them shine and print clean.—F. M. ROOP.

When retouching his negatives the photographer can, if he has the genius, do almost anything, so that he has shadow enough as a basis. Here he becomes, as I have said, the creator, and of all the different operations of a negative, this is the portion where the artist stands out most prominently, and proves what stuff he or she is made of. There is no end to the variety of work one may introduce—grains to look like engravings, hatchings, stippling, brushwork. It is not enough to be able to remove spots and blemishes, or soften off harsh contrasts; girls mostly get up to this mark of excellence, and produce those smooth, meaningless, pleasant portraits of everyday life. The retoucher must learn to keep an expression of the negative, or make one if not there, and this is the lofty calling of a true retoucher. He must put a soul into his model, else he cannot call himself an artist any more than the painter can claim the title who only daubs potboilers. But if the retoucher can do this, and has art enough in himself to prefer soul to beauty or beautifying, then he has as much claim to call himself a painter or an artist (if he prefers that title) as any R.A. in the clique divvie.

Expression, or soul, is what photographers are as yet deficient in, and that is the province of the retoucher. I want to see a photographer rise above the prejudice of the flattery-loving public, and lead them by intensity; give to the public faces, ugly as Rembrandt's portraits, yet pregnant with character. I want to see seams, and wrinkles, and warts, as the Great Creator left them—indexes to the wearer's character—and not doll faces, which simper and mean nothing. I want noses in all their varieties, with their own individuality intensified; cheekbones standing out as they may be in the originals. I want men and women sent down to posterity as they are, and not as they would like to be; for I never yet saw a face in its natural state that I could call ugly, although I have seen faces by rouge, and powder cosmetics, and false eyebrows, and also by the retouching which they were themselves so delighted about.

Vice and crime darken the souls which sit behind the eyes—make chins hard, and lips thin or coarse,—destroy curves which are upon all lips when innocent; yet to me, the most demoniac face that ever peered out upon a hunting world is better in its sombre gloom than that same face smoothed by a bad or mechanical retoucher. Beauty is expression, not chiselled features. A baby is not beautiful until it can notice its mother; then the meaningless bit of flesh is lighted up by a ray from heaven. That God-beam the photographer must catch; yet is not a smooth surface, but a light breaking through torn-up cloud mists.—HUME NISBET.

For plain photographic work I advise you to have by your side a palette, upon which are ground moderate portions of a good black India-ink, warm sepia, and scarlet lake. With combinations of these you can readily imitate the photography upon which you are working, whether it be cold or warm in tone. Of course, it is necessary to apply these tints with a brush; and if you use plain water as a dilutant, you will leave a dead surface that betrays your trail. Everyone will exclaim: Why not, then, use gum water? that will leave a gloss. Perfectly right; but it leaves too much gloss. In addition, I don't believe that the half of you know how to make gum water.

Accept my formula, and adopt it or no, as you see fit:—

Picked gum arabic	...	...	...	...	1 ounce
Loaf sugar	...	...	...	...	1 drachm
Acetic acid	...	...	...	...	30 minims
Alcohol	...	...	...	...	30 "

water in sufficient quantity, say from six to eight ounces.

Don't be frightened at the mention of the acid, and at the idea of putting a modicum of it upon the surface of your photograph. Used in this way it will not, I assure you, prove destructive in the slightest degree.

The gum water, however, I do not use for the indicated purpose. There is a better vehicle—the much abused, always useful, *albumen*.

I have before this published a method of making a stock albumen that is equally as serviceable for this as it is for many other purposes. It is not original with myself, but I have used it for many years, and have come to consider it an indispensability in a studio or gallery.

Take the whites of eight eggs, carefully separated from their germs, and add to the mass twenty-four of glacial acetic acid, diluted with one ounce of water. Stir well for a minute with a glass rod, making no attempt to beat into a froth. Let the liquid rest for at least an hour, and then strain through cambric muslin. Finally add half a drachm of liq. ammonia, F.F.F., bottle, cork tightly, and use as required.

Slightly diluted with water, nothing can excel this as a vehicle for water-colour painting upon albumenised paper. Of its utility for the preparation of negative glasses, for transparencies, and for porcelain work, I have already spoken.

If you cannot touch out the spots neatly, you had better allow them to remain. On numberless occasions I have seen prints of what were supposed to be good negatives, that might readily have passed for maps of the heavenly constellations. They were filled with white spots, crescents, and lines. I have frequently asked the privilege of inspecting the plates from which they were made. In most instances the printer had endeavoured to conceal small pinholes or light scratches with that very useful paint of my manufacture (Opaque), and instead of having a scarcely discernible dark speck on his paper, caused the appearance of a white blot, somewhat difficult to eradicate. To remove these transparent imperfections upon the negative, you must possess a sharp eye, a steady hand, a fine brush (Opaque, of course), and a clear comprehension of what you are doing. Almost invariably when I have washed away the colour that had been applied, I have found that at least three times the necessary quantity had been used.—JOHN L. GIBSON.

Many a valuable negative has been lost because no system adopted by the photographer has existed for numbering the same. The engraving diamond (Fig. 341) will prevent loss in this direction, if its use is adopted. It is, in form and size, something like a short stylographic pen, and consists of a metal handle, about five inches long, at the end of which a diamond is permanently set for the purpose of writing and figuring upon glass. We are assured by the manufacturer that it will even write on steel.—GEORGE MAY POWELL.

Below are some hints regarding the use of the well-known style of coffee-pot shown in fig. 342, as a varnish pourer, and as a means of separating the clear varnish from the particles of dirt, &c., apt to get in the varnish when coating plates. The engraving will show exactly how it works. A piece of cotton flannel is made to fit into the inside of the top portion, and on that some filtering cotton. After flowing the negative the surplus varnish is poured back into the top, and by filtering back into the pot we have the varnish always clean and nice. The bottom of the part marked 1 is covered with a fine wire gauze. They can be obtained at any kitchen furnishing store.—A. MARSHALL.

*For the Production of Artificial Negatives by Scratching in Lines with one or several Needles.*—Prepare a thin negative collodion, containing much iodine, which is as usual poured over a glass plate and prepared in a silver bath. After having taken out the plate, and cleansing the same on both sides with water, it is dried and laid on a black cloth, with the prepared side on top.

If the collodion contained much iodine, the collodion will appear of a light yellow hue, which in this case is just the thing wanted.

Now make several instruments, with two to eight needles ranged together in a straight line, with sealing wax, with which a drawing can be scratched in the yellow layer of iodide of silver. The diagram herewith (Fig. 343) represents the instrument, *a* being the sealing-wax, and *b* the points of the needles. After tracing carefully the outlines of a drawing upon the yellow layer, so that the layer does not get injured, we proceed to the production of the whole drawing. For delicate details only an instrument of two to three needles is used; but large spaces are rapidly covered with an instrument of many



needles. Each scratch appears black as the yellow layer is removed, showing the black sub-layer.

The picture is extremely pleasing, as the lines run beautifully parallel, and afford many very delicate gradations. The scratched-off yellow dust must be often removed with a broad marten brush. When the drawing is finished, pour on the plate a concentrated solution of fuchsine in alcohol, and wash off with water. The fuchsine colours only the porous collodion, but not the clean spots of the glass, and renders the picture more opaque, so that it is perfectly suitable for heliographic or photo-lithographic purposes.

Finally, the negative must be varnished, but a diluted solution of gelatin, or gum-arabic answers better, because an alcoholic varnish dissolves the fuchsine. The intensifying can also be done in other different ways.—JOHN L. GIBON.

*To Remove Varnish from Negatives or Ferrotypes.*—Use saturated solution of cyanide of potassium, one part; alcohol, 95°, two parts; flow on and off as in redeveloping; will clear off varnish very rapidly, so the negative or positive can be washed under the faucet, dried, and revarnished, bright and fresh as new.

I discovered this method—partly by accident—some months ago, and have used it many times since, always successfully; and having never heard of any other method as good, I send it for others to try.

I have at various times tried most of the published methods for removing varnish from collodion films—for instance, pure alcohol bath, ammonia and alcohol, common crude potash and alcohol, vapors of hot alcohol, &c.—all more or less available, but in my experience all more tedious, more expensive, or more dangerous to such films than this method.

Whether the cyanogen aids the solvent action of the potash or not, the materials for this combination are ready in almost every gallery, and seem perfectly reliable in action.

Of course, it must not be used on negatives strengthened with bichloride, or similar chemicals especially soluble in cyanide.—E. K. HOUGH.

## AN UNPRACTICAL PAPER ON "RETOUCHING."

BY WILLIAM HEIGHWAY.

If such a terrible thing as an avowedly unpractical article appears to our Editor likely to undermine the discipline of his contributors (to whom he is always issuing the injunction "Be Practical"), let him, for the sake of harmony all round, quietly drop these notes into his waste-paper basket.

Yet I am not (knowingly) impelled to mischief out of sheer wantonness, or the necessity to fill up an idle hour; but of a truth I am possessed with some sort of idea that protest is really called for, and (though alas! doubtfully) that it may work for good. These my misgivings set forth, let me to my work.

I have before me a book—a great, fat, heavy book—imposing in appearance, rich in illustration, splendid in "get-up," heavy in price. Its title-page sets forth its claim to being "A Collection of Hints on Practical Photography," and, withal, "A Complete Text-Book of the Art," by Edward L. Wilson.

Now here, in these five hundred and odd magnificent quarto-pages shall I find a mine of wealth, a very storehouse of interesting and valuable matter, quoth I, as I carried the precious volume home.

In that expectation I was, however, very grievously mistaken. I soon began to recognise in it a hash-up of old articles from an American magazine—not that that in itself would be so bad, because there is much that is valuable to be found in the magazine—but in this case the articles had been "selected" at random, and without either intelligence or care; the value of the good and thoughtful matter being entirely done away with by its appearing cheek by jowl with so much that was absurdly weak and unpractical. In this "Complete Text-Book of the Art," are to be found a lot of very indifferent, and too often purposeless stuff, literally pitched together, the poverty of idea and apparent lack of intention being reflected in the large type notes above, which serve only to show how little the author of the Complete Text-Book has to say.

One certainly looks for *some* little original writing in a book of this pretentious character. Here it is to be found in a dribbling rivulet (in many cases only two lines of big type) meandering in a purposeless little way along the top of these imposing pages.

Let us see what the author has to say, for instance, under the head of "Retouching," that being the subject of my unpractical paper.

"Chapter XVII.—Retouching and 'Doctoring the Negative.'

"79. This subject is so fully treated in *Wilson's Photographics*, and in a dozen other volumes, that further instructions would seem superfluous.

"Moreover, the instructions given have been so *mal-*treated by photographers as to discourage further suggestions.

"There is a disposition, however, to return to 'bottom facts,' or in other words, to do less retouching and doctoring, and to endeavour to secure a better quality of negative by careful manipulation in the dark-room. This is a cheerful sign, and warrants me in confining the chapter before us to some selected notes gathered from the suggestions of practical workers. So much for general work.

"Where special objects are to be attained, special resort may be had to artificial means. Wisdom and care should always be exercised.

"A neat photographer will punctiliously number his negatives, and when necessary title them. An engraving diamond is a convenient tool for such work.

"The varnishing of the negative should not be neglected, and if, for any reason, the varnish must be removed, extra care will be rewarded by the best possible success."

This forms the *entire chapter*, all that the author has to say on the important subject of "Retouching" in this "Complete Text Book of the Art," occupying seven whole pages with the cuttings which are equally relevant to the subject. My tired eyes may have overlooked some practical hint on retouching, but I do not think there is one to be found.

Methinks it is a sorry compliment to the intelligence of photographers that such a book as this is written for their instruction.

Another and graver matter on which for some time past I have been tempted to write is to express the fear that photography is becoming a slave to the fatal dexterity of the retoucher. The evidences of it are to be seen in every show case and album. Instead of the pictures of men and women, we find lifeless and unmeaning, but very "pretty," doll faces.

Let me instance two pictures likely to be known to most of the readers of this journal. One a technically splendid portrait of the Queen, taken somewhere about Windsor, I believe, but by a *Court Circular* fiction to be (for some inscrutable reason) accounted as taken in Ireland. As the Queen has not been in that sorrowful part of her dominion for twenty years or so, perhaps the loyal artist strove to carry out the fiction by endeavouring to take off the marks of time by obliterating all the characteristic lines of the face, as well as a portion of the royal cheek and chin. I cannot help regretting this, as the picture, so excellent in most respects, loses a great deal, if not all, of its historic interest.

Another awful example is to be found in the portrait of a noble and handsome lady, an authoress of eminence who has recently, alas! laid down the pen for ever. This is entirely marred by the excessive work on the face, by which all the character and grace of a beautiful and gifted lady has been pencilled away, and a sorry substitute offered us in its place.

Could both of these heads be even partially restored to us in their truth we should be the richer.

[The reader of the above article must not form his opinion without reading what we have to say on p. 498, under the head of "Wilson's Chapter on Retouching and Doctoring the Negative."—Ed. P. N.]



## NEGATIVES FOR PHOTO-LITHOGRAPHY AND SURFACE BLOCK PRINTING.

BY MAX JAFEE.\*

*Developer.*

Water	...	...	...	1,000 grammes
Sulphuric acid	...	...	...	12 drops
Protosulphate of iron	...	...	...	40 grammes
Alcohol 800° (90 per cent.)	...	...	...	25 "

During development, the plate must be slowly and continually moved in such a way that the solution runs up to the extreme edges and corners, otherwise no even image is obtained.

*Fixing.*

Cyanide of potassium or hyposulphite of soda solution. After fixing, the plate must be thoroughly washed.

*Intensifying.*

A. Cold saturated solution of bichloride of mercury.

B. Cold saturated solution of iodide of potassium.

Solution B is slowly added, with continual stirring, to A, until the red precipitate which is first formed is re-dissolved. This mixture now appears clear and of pale yellow colour. It may be diluted according to necessity, and can be preserved for repeated use. A slight muddiness shows that the negative was not sufficiently washed before fixing. If the negative after fixing appears unequal in density, some places being weaker than others, this defect may be remedied by skilful manipulation in intensifying. Places of less intensity print more quickly, and, in consequence, lines and points come out broader than they do in the other more intense portions of the plate.

*Blackening.*

The following intensifier is not permanent in the light, and requires, therefore, further treatment, which we will merely call "blackening." If the intensity appears already sufficient (and it must be borne in mind that this intensity increases as the film dries), it suffices to pour over the film dilute ammonia; if, however, the negative requires further density, it is covered with a solution containing one part of sulphide of ammonium to four parts of water. In both cases care must be taken that the blackening of the film is carried through completely to the glass; this can be ascertained by examination through the back of the plate. The sulphide of ammonium solution must be kept well preserved in air-tight bottles, and used only so long as it appears of a light yellow. It is well for daily use to mix a small quantity with the specified amount of water. After treatment with the sulphide the plate shows a plentiful amount of green fog; this is removed by the application of a very dilute solution of hydrochloric acid, a few drops in 100 grammes of water. If the intensity is still insufficient, the intensifying may be repeated. When the negative is thoroughly washed it is flowed over with a ten to twelve per cent. solution of gum arabic. Varnishing is not necessary; if, however, this is done, it must be remembered that what intensity has been gained in drying will be lost again in varnishing. The latter effect may be avoided by flowing, before varnishing, with a ten per cent. solution of gelatine instead of gum. It is not recommended to allow the negative to dry, and then to re-wet and apply the intensifying solution, as the bath does not in this case work so well, or take such an even hold. If there is not time to intensify immediately, the negative should be placed in a dish covered with water until it can be attended to.

*Reducing.*

If the negative, when intensified with mercury and sulphide of ammonium, appears too intense, this density may be reduced by a strong solution of cyanide of potassium. With very dark originals, having but small white places, it may even happen that the negative comes of too great intensity in the first instance. It may then be reduced by the following solution. A few flakes of iodine are placed in a flask with but very little water. Crystals of iodine or potassium are next added in quantity sufficient to cause the iodine to dissolve. This solution is diluted with water until it appears something like porter. The negative is flowed over a few times with the mixture, and then, after washing, again fixed. This proceeding, also, may be repeated if necessary.

*Grating Negatives.*

Many systems have been tried for the purpose of resolving the half tone of a negative into a grain, and thereby to render it available for photo-lithographic transfer, or for printing by the block method; but the outcome of all these experiments in

that direction is that the surest and most practical method is that of forming a grating of lines crossing one another during the exposure. Two glass plates are employed, one having lines from the left downwards to the right; the other with lines running from right to left. The transparent spaces are of equal width with the opaque lines. According to the fineness that may be desired, these lines may vary from four to six millimetres in breadth. For every size a pair of transparencies must be provided, having lines in contrary directions as described.

In order to be able to change the transparency grating, the dark slide is generally taken from the camera and brought into the dark room. From that proceeding, however, it often results that in spite of the utmost care the picture is somewhat shifted on the plate. I will here describe a method which allows us to work with safety, since the dark slide keeps its place all the time. The necessary arrangement is seen in Fig. 1. To the large camera, a smaller appliance for holding the dark slide is attached of a size sufficient for the transparency grating in use. In this appliance there is on the left side a red window, A. On the opposite side a door and a large cloth impervious to light. For greater safety this addition to the camera is supplied with a support from the ground; the support is not shown for the reason of keeping the picture free from confusion. In Fig. 2 is shown how the lined transparency is fixed when in use. The sensitive plate, *c d*, is placed in the usual way in the dark slide, the back of which is shown at A. At the top of the line transparency, the knob, *g*, is attached for convenience of handling. By means of the springs, *h h'*, the transparency is held against the sensitive plate. The prominences at *e* and *f* are half-round pieces of glass attached to the four corners of the plate, in order to prevent it from coming into actual contact with the sensitive film.\* Since one can work with one hand only in the attachment of the camera, it is recommended in place of the springs that hold the lined transparency in place, to have a hinged frame as shown in Fig. 3, bearing these springs. A single movement then brings the springs into action, and a self-acting catch at *n o* holds the whole firmly together. The line transparency, *a*, is placed before the commencement of the exposure in position, and after half the time has been given that is considered necessary, it is changed for the transparency, *b*. This change is, with the arrangements described, very quickly made. It should be observed that the dark slide should not, as is generally the case, have a spring opposite the centre of the plate, as a thin glass might then be pressed at that place into contact with the transparency. It is better, therefore, to have a frame or board of the same size as the negative furnished with springs at the four corners, and fitting into the carrier behind it. Still safer and simpler than this method for changing the transparencies is that described in my paper, "Photography without a Camera,"† published in the *Photographische Correspondenz*, July, 1888.

6. *Preparation of the Transfer Paper.*—In one thousand grammes of water, thirty grammes of hard gelatine are swelled, and then dissolved by heat in a warm bath. Fifteen grammes of glycerine are next added, and the whole filtered through flannel. A sheet of plate glass, somewhat larger than the paper to be prepared, is then levelled. The paper, which must be made from very fine rag pulp, is dipped in cold water in a flat dish. When the paper is thoroughly moistened, for which purpose it is sufficient to draw it slowly through the water, the plate glass is taken from the levelling stand, rested against a wall, and the wet paper is laid upon it, beginning at the top, and avoiding all air-bells. The plate is then again laid, paper side up, on the levelling stand, and the edges turned up about the width of a centimetre. The gelatine is now poured on, all air-bubbles being avoided. Two hundred and fifty grammes of solution will suffice for a sheet measuring 45 by 59 centimetres.‡ When the gelatine is thoroughly set, the paper is slowly lifted from the glass, and hung up to dry with clips. The place in which these manipulations are carried on must be perfectly free from dust.

7. *Sensitising the Transfer Paper.*—The sensitising bath consists of—

Water	...	...	...	1000 grammes
Bichromate of potash	...	...	...	60 "

\* Many photographers, instead of glass, cement cartridge-paper to the lined transparency. This plan is not to be recommended, because the large surface of the paper is apt to cling to the moist wet plate, and in separating the transparency from it, sufficient force has to be used to endanger the shifting of the negative and consequent doubling of the image.

† See first note.—TRANSLATOR.

‡ About 8 ounces for a sheet 24 by 15 inches.

\* Continued from page 493.



Caustic ammonia is added until the reddish-yellow colour of the solution is changed to a pale yellow. If, when in use, the red-yellow colour returns in consequence of evaporation of the ammonia, more is added. An excess is not injurious. The chromate bath is filtered into a flat dish, somewhat larger than the paper. The paper itself is immersed in the solution with the coated side uppermost, and kept in until thoroughly penetrated and quite soft. The chromate bath must be of a temperature of about 15° Reaumur. With a lower temperature the solution does not thoroughly penetrate the gelatine film, which then does not properly take the ink. The paper, being thoroughly soaked, is slowly lifted from the bath, and as soon as it drips slowly it is handed over by the two corners, by which it has been lifted, to a second person, who holds it over a sheet of plate glass, which is somewhat larger than the paper. This plate must previously have been well rubbed with talc, and lightly dusted with a soft broad brush. A scarcely visible film of talc should be left upon it. The paper is now laid face downwards upon the glass, and pressed into close contact by means of a fine soft cloth used to stroke it on evenly, and with an avoidance of air-bubbles. The assistant holds his two corners until the whole sheet is pressed down. The paper is then pressed with greater force, either with the cloth or with an india-rubber squeegee, till all excess of bichromate solution is driven off. If this last operation is not carefully performed, brown spots appear which interfere with the sharpness of the print. The plate, with the paper upon it, is placed to dry in an airy room, from which daylight is excluded, and which in winter must not be too strongly heated. Drying occupies from six to twelve hours. By the use of a ventilator with a powerful exhaust fan, the process of drying may be much accelerated. Only when thoroughly dry, which can easily be ascertained by passing the hand over it, must the paper be stripped from the glass. The paper is now placed in a box, not in too dry a place, but must be used within twenty-four hours.

8. *Printing on the Transfer Paper.*—The progress of the printing is, as with albumen paper, judged by direct observation. The design should appear of a pronounced brown colour, otherwise the ink will not take. Printing must not, however, be carried to too great depth, as then the lines would come too wide. With practice the proper depth is soon learnt. The use of a photometer is not recommended, as for this process it is an untrustworthy guide. Printing may be carried on either in the sunshine or in the shade. When sunshine is available, it is best to use it. It not unfrequently occurs that certain portions of the plate print too quickly, especially, as has been mentioned, from unequal intensification, also from very deep shades in the original, particularly with copper-plate engravings. Such weak places must, as is done with negatives from nature, be touched on the back of the plate with carmine. On the other hand, with fine lines surrounded by large white spaces, it often happens that they print too faint. In this case the whole of the back of the negative is coated with tinted collodion or varnish, which is scraped off opposite the weak places, so that they may print more strongly. In both the latter cases the frame (if the printing is carried on in the sunshine) must be kept constantly moved. With technical designs it is often of importance that the reproduction shall be of some exact measure. In this case the negative must be 0.04 larger than the desired dimension. If the print has to be 50 centimetres long, it must measure on the negative 50.2 centimetres.

9. *Inking and Development.*—The simplest, safest, and at the same time quickest and most efficacious method of inking is with a velvet roller.\* The ink is spread with an ordinary leather lithographic roller upon an inking slab. Any good transfer ink will serve the purpose. The velvet roller is then worked upon the slab, and next rolled over the paper, which has been laid face uppermost upon a sheet of plate glass, until it appears of an even medium grey tone all over. The paper is next immersed, air-bubbles being avoided, in a dish of cold water, in which it is left for from ten to fifteen minutes. The paper is then lifted from the dish, and the water allowed to drip from it, and it is then again laid face upwards on the sheet of thick plate glass. A sheet of tissue paper is next laid upon the printed side, and the water pressed out. This is best accomplished by rolling with a clean lithographic roller; care, however, must be taken not to form any creases in the tissue paper, as these would injure the film. The damp, but not wet, film is now rolled again

with a velvet roller containing ink. Under this rolling the picture begins to develop beautifully. When the drawing shows clear in all parts, and the paper no longer appears yellowish, it is only required to go over it with a wet sponge to wipe away the ink which adheres to the lights. Gentle pressure is used, and the sponge is worked in cross directions. For very fine lined prints and grating (half-tone negatives) fine cotton wool is used instead of sponge. If, however, after rolling, the paper shows any yellow colour, it must be again immersed in water, and the rolling repeated before treatment with the sponge or cotton wool. The velvet roller never requires to be cleansed from the adherent ink, and is kept, when not in use, free from dust, wrapped round with tissue paper. If the velvet is worn or crusted with dried-up ink, it must be stripped off and renewed. If the transfer ink is too thick, it must be thinned down with poppy or nut oil. The workroom must always be kept at a good temperature, and must not in winter be allowed to become too cold at night, otherwise the ink will take badly or not at all. The developed print is laid between folds of blotting, or if of very fine lines or from grating negative between tissue paper, in order to press out the water; it is then made fast with pins or tacks upon a board and allowed to dry spontaneously.

10. *Transfer to Lithographic Stone, Etching, and Printing.*—The dry print is, like any other transfer, laid between damp sheets of blotting-paper. In grating negatives there must here also be used tissue paper instead of blotting-paper. Moreover, it must be observed that with grating negatives there must not be a less margin than one centimetre all round the image. The print must only be so far moistened that the point of the finger pressed upon a white place remains adherent but a short time. At the first passing through the press only light pressure must be employed, which is increased each time of passing. The print is, without being again damped, after the last pressing, pulled from the stone. If it does not come off easily the stone is taken out of the press and placed in a cold room for a short time, whereby the removal of the transfer is much facilitated, or the transfer is allowed to dry spontaneously. The rubbing on or strengthening is performed in the usual way, only with fine designs or grating pictures it proceeds very slowly, very little ink being used with the sponge. The stone is, after the completion of the rubbing-on process, gummed and dried. It is allowed to stand for some hours, the gum is washed off, the stone cleaned with turpentine and water, rolled in again with transfer ink, and dried. Now follows the extraordinarily successful, simple, and certain method of etching (*Teykauf Freie Kunst*, Vienna, 1888), which renders the employment of any patented methods superfluous, and which surpasses them in simplicity and certainty. The transfer is dusted over first with resin and then with talc. A wooden lathe, about eight centimetres broad and two centimetres thick, is covered with cloth. Two long narrow strips of from two to three millimetres thick, are then cut from millboard, or even wood, and laid on the long sides of the stone outside the part covered by the picture. The ends of the strips are held on the stone by an assistant, who presses them down with his fingers, and the lathe is moistened on one of the broad sides with sulphuric ether. It is now laid, either side downwards, upon the strips, and drawn slowly along from one end of the stone to the other. This single passage of ether vapour over the stone suffices to melt the resin. It is now etched with a mixture of water, nitric acid, and gum. The mixture must be strong enough to cause effervescence. After the etching the stone is again washed and cleaned. By this etching the printing bath in hand and in steam presses is essentially facilitated, not so much because the lines are somewhat raised, as because the uninked parts of the stone take the water more freely, and thereby better resist the ink. Clogging or smearing of the fine lines is also less to be feared, and even glazed paper need not be moistened. As I understand, photo-lithography is but little cultivated in England, but for the most part in its place deep etching on zinc. If the pictures are not to be printed with the text, so that the use of a letter-press is not essential, then in most cases the transfer to stone and printing in a lithographic press may be recommended as quicker, simpler, cheaper, and more elegant, and I shall rejoice if my foregoing exposition results in the process finding more friends.

11. *Transfer on Zinc for High Relief.*—Ten parts of bitumen of Judea (the sort that melts easily) and one part of yellow beeswax (genuine) are melted together, and when cold finely powdered. The powder is sifted afresh before each time of using. The print, which must have been blackened and be-

\* The leather is removed from a worn-out lithographic roller, which is then covered with fine short-piled wool velvet.



come completely dry, is dusted over with this powder with a pad of cotton wool. It is then held, picture side down, over a spirit lamp, and gently warmed till the drawing shows dark and has a matt surface. Too strong heat gives a glossy surface, and renders the transferring difficult. In this condition the print may be left for months before being used. The print is then immersed in cold water, after which it is slowly drawn through a cold saturated solution of alum, and again washed in clean water. It is now, in order to obtain equal distribution of moisture, laid between sheets of blotting paper (grating pictures in tissue paper). The zinc plate is warmed to about the same temperature that is used for varnishing negatives—about 40° Reaumur—the copy laid upon the plate (several may be laid on at one time), and passed at first with light, and then with very powerful pressure, through the press. With a cylinder press a glazed tympan should not be used, but a fine blanket. When sufficient pressure has been applied, the back of the transfer is moistened with a sponge dipped in cold water, and it is again passed once or twice through the press, and then laid for a minute or two in cold water. After this the paper is pulled off, and if all the manipulations have been correctly carried on there should remain no ink, or scarcely any, on the paper. The transfer now appears of a brown colour and very sharp on the plate; any further rubbing on with ink or strengthening with powder is useless, and after the edges and back are protected in the usual way with lac varnish, the plate is ready for the first hitting in with acid. This method of transfer gives results but very little inferior to the method of direct printing on zinc coated with asphalt. On the other hand, it possesses the advantages of being more quickly executed, and gives the possibility of etching several plates at once. The same method of transfer can also be applied to stone; the warming of the stones can be advantageously done in the sun. When the transfer is made it can be etched without the strengthening process previously described.

### Notes.

It will not be surprising if the rage for photography of the last two or three years leads to an increase in the professional ranks. Few pursuits are so engrossing, and it is very easy to imagine because you have been successful in producing pictures that you will also be successful in making money out of your skill. But the two things do not necessarily go together. Just now competition is so keen, and the public's interest in professional photography so languid, that even men who have been in business for years are complaining bitterly. These complaints will, however, scarcely deter young enthusiasts from rushing in to try their fortune.

Those about to tread the path of professional photography find at the outset two courses open to them—either to buy a business, or establish one. The first is waylaid with pitfalls, the second is a work of years and struggle. Nothing is more common than for the novice to find, after he has parted with his money for an “old established business,” that the neighbourhood is thoroughly worked out. Nearly all the residents have had their portraits taken, and don't feel inclined to go through the operation again. There is also the unpleasant discovery that all the business has gone to an energetic rival, whose existence the vendor carefully concealed during the negotiations. Worst of all, is the uncomfortable revelation that your predecessor was given to indulging in potent liquors, and has given the studio an irretrievably bad name for careless work and non-executed orders.

And the drawbacks of purchasing a business are not

confined to this list. Say that a man who has made a name in the profession parts with a business which has an irreproachable reputation. The buyer will most likely be disappointed in the result, for a photographic connection is a very personal matter. It is very clear a photographer can no more sell his reputation than can an artist. We know of instances where businesses have been sold for large sums, and in the hands of the purchasers have proved hopeless failures. The new-comers were men of equal skill with their predecessors, but they had not got the “name,” and custom at once began to fall off. No doubt such a business is worth judging by the actual returns, every farthing of the sum paid, but a bargain of this kind we cannot help thinking is attended by a good deal of risk. Paradoxical as it may appear, the high reputation of the vendor is, to some extent, a disadvantage rather than an advantage. It will be seen from these remarks that we have not given much encouragement to the amateur to become a professional, but as advice is rarely taken, we do not suppose anyone who has really made up his mind to venture will be deterred.

Orthochromatic photography, perhaps more than any branch of camera-craft, has been clogged and hampered by the pretensions of the commercialist, a matter well illustrated by a letter of Vero C. Driffield, which we publish this week. In this letter the reader is brought back, in respect to orthochromatic photography, almost to the position taken by the PHOTOGRAPHIC NEWS thirty years ago. Mr. Driffield concludes his letter by saying, “I am disposed to think that an orthochromatic result can only be obtained by means of a yellow screen, and that with this adjunct any sensitive plate will yield orthochromatic results.”

The prints referred to by Mr. Driffield we have placed in the hands of a photo-engraver, who will reproduce them in block form, so that our readers can judge for themselves as to the views expressed in his letter.

The use made of photography by a member of the Foresters' High Court on Tuesday was, we cannot help considering, an unworthy attempt to obscure the truth. The Court had under discussion the question of the admission of negroes to the order, and the delegate from Durban, to enforce his objections to black people, held up a photograph of almost nude natives, one with seventeen wives. The obvious attempt to prejudice the matter was received with a storm of indignation, and when this had subsided the delegate observed that the picture only represented what was to be seen every day in Durban. This statement was, however, contradicted by other authorities, who contended—which, indeed, is very well known—that natives are compelled to wear clothes when they come into towns; while another delegate, himself a man of colour, emphatically denied that the delegate who had exhibited the photographs had accurately pictured the natives of South Africa. Anyway, the Court refused to be influenced by the photograph, and carried by a large majority a resolution which practically was in favour of the admission of negroes.



The terms used in art will shortly have to be adapted to photography. The *Scientific American*, in a recent issue, gives a very interesting account of a marine toboggan, wherein the operator, after sliding down a course of 178 feet long, finds himself plunged in the sea. The idea is an excellent one, and the bath to a swimmer must possess many attractions. All we have to find fault with is the statement that "the illustrations accompanying this account are from instantaneous photographs." We do not deny that the artist has drawn from instantaneous photographs; all we wish to point out is that he has omitted to state how far is the distance between his drawing and the photograph. It is quite time the term "after" was introduced in describing supposed reproductions from photographs. "After," in instantaneous photographs, leaves quite sufficient for the imagination to supply. In the case in point there is certainly much more of the artist than the photographer.

## Reviews.

PROCEDES PHOTOGRAPHIQUE AUX COULEURS D'ANILINE.  
Par Geymet. Crown octavo, 105 pages. Price, 2f. 50.  
(Paris, 1888: Gauthier Villars, 55, Quai des Grands Augustins.)

This little book deals with several ingenious methods of making photographs in aniline colours; the general principle being to form a solid image in a colloid body, such as gelatine or albumen, and then to stain this with a solution of the dye.

TRAITE PRATIQUE DE GRAVURE AU DEMI-TEINTE, PAR L'INTERVENTION EXCLUSIVE DU CLICHE PHOTOGRAPHIQUE.  
Par Geymet. Crown octavo, 136 pages. (Paris 1888: Gauthier Villars, 55, Quai des Grands Augustins.)

The author gives in this little handbook, concise and practical directions for photo-engraving of tint subjects, both in hollow line, and in relief line.

L'ART DE RETOUCHER LES NEGATIVES PHOTOGRAPHIQUES.  
Par C. Klary. Crown octavo, 86 pages. Price 2 francs.  
(Paris 1888: Gauthier Villars, 55, Quai des Grands Augustins.)

A WELL written and practical handbook by an experienced worker.

L'ART DE RETOUCHER LES EPREUVES POSITIVES SUR PAPIER.  
Par C. Klary. Crown octavo, 32 pages. Price 1 franc.  
(Paris 1888: Gauthier Villars, 55, Quai des Grands Augustins.)

A SUITABLE companion to the previously noticed work. Both might conveniently be bound together.

TRAITE PRATIQUE D'IMPRESSION PHOTOGRAPHIQUE AUX ENCREES GRASSES. Par Moock. 3rd Edition. Par Geymet. (Paris 1888: Gauthier Villars, 55, Quai des Grands Augustins.)

A NEW edition of a useful book, and an edition well brought up to date.

## THROUGH JAPAN WITH A CAMERA.

BY W. K. BURTON  
CHAPTER III.

HAKODATTE (continued)—AINOS—JAPANESE BATHING HOUSES—ZUNSAINUMA.

THE first few days of our stay at Hakodatte were occupied exclusively with business which included a lecture by the writer on sanitary matters. This, of course, had to be

done through an interpreter, an arrangement which is rather awkward, but gives one the advantage of having plenty of time to think of something to say.

The Japanese are immensely fond of speeches, lectures, and so forth. They will listen to a discourse on almost any subject with the most unwearying patience. The country should be a paradise for preachers.

Hakodatte is, as I have said, in Yezo, the most northern large island of Japan, and in this island is the dwelling-place of that strange race called Aino (pronounced like the two English words "I know"). Of these a few words should be said. The race is one not only different from the Japanese, but in every respect contrasting strongly with it. Physically and mentally the two races are as different almost as two races can be. The Japanese are smooth-skinned, and have little hair on their faces or limbs; the Ainos are a rough-skinned set of beings, who grow huge beards, and are often covered so completely with hair as to be almost like monkeys. The Japanese are a quick, intelligent, lively, and cheerful and exceedingly sociable race; the Ainos are a slow, dull, stupid, morose, and unsociable set of beings. They would appear to be an absolutely lower type of animal than any civilised race of men, inasmuch as they are not only untaught, but are apparently unteachable. They have no written language, and no means of exchange except barter. Their tools, except such as they get from the Japanese, are still made of stone.

If we can be sure of anything resting on circumstantial evidence only, we may safely believe that the Ainos represent the original inhabitants of Japan, a conquering race, where from is a great question of debate just now. Of course there are not wanting the some who can prove to their own satisfaction that the Ainos represent the "lost tribes," others who can perform a similar office by the Japanese!

I could say very much more that might be interesting about the Ainos, but it would not be at first hand; and I am warned by the fate of a certain lady writer not to take much concerning them at second hand, or, for the matter of that, first hand, but only from actual observation.

The lady in question is a great traveller, and has written many books about her travels. She journeys quickly through a country, penetrating with extraordinary pluck to the wildest and remotest parts, then writes a description of what she has seen, brilliant and fascinating to read, but sometimes it is found to be marred by considerable inaccuracy and much exaggeration. She devotes a great portion of her book on Japan to the Ainos, most of her information having been got from an Aino chief. Now this Aino chief is still enquiring anxiously when the "foreign woman" is about to return, because, he says, he has invented a number of stories better than those he told her last time. Nor is the old gentleman a keen humorist, as might be supposed. Cunning and intuitive inclination to falsehood seem to form a portion of all poorly developed minds.

One thing that can be said of the Ainos without fear of inaccuracy is, that they are dying out. The contact of a race mentally more powerful is slowly wiping them out, as appears always to happen when such a contact takes place.

The first few days at Hakodatte were, as I have already said, spent in business, a description of none of which would be of any interest to the reader, except perhaps a word or two about the hot springs. Japan is a volcanic country, and there are numerous hot springs in various parts of it. These are simply springs of hot water issuing from the ground. The water naturally, being hot, always contains some salts in solution, and is often powerfully medicinal. The discovery of hot springs at Hakodatte is of quite recent date (a boring made for cold water having resulted in the springing forth of hot water), and is considered to be of great consequence to the town.

The hot water from the springs is led to large baths which in most places that I have seen are quite open to



the street, and are used indiscriminately by people of both sexes, and of all ages and classes.

This applies not to the water from natural springs only, but to most of the public baths of any kind in Japan—I mean their use by the two sexes indiscriminately—but in Tokio they are not visible from the street. In Hakodatte, for the first time, I saw bathing, such as I speak of, openly done, and it certainly is a curious sight. One may have considered well that mere nakedness, where it is customary, is by no means indecency; but the first time a foreigner sees the Japanese bath—a sort of tank sunk under the level of the ground—with its crowd of men, women, and children all splashing about and chattering loudly, it will always be with a sort of shock, and an inclination to turn very red.

I could readily enough have photographed the bathing scene—not at Hakodatte, but at some other places I have been at—but fear that a reproduction of it would not be permissible in England.

It should be distinctly understood that there is absolutely no indecency connected with this bathing, or with many other similar customs in Japan which, at first, seem to the foreigner indelicate. Indeed, one is struck with the total absence of any indecency, and the apparent indifference of the sexes towards each other. One almost comes to believe what I have heard very seriously stated, that clothing of the body is the first step to all prurency and nastiness.

One day we spent at a place a little distance from Hakodatte, named Zunsainuma, a beautiful country of lake and mountains. It is high, and some sixteen miles from the town. The road there and the little hotel we stayed in are made notable to me by a recollection of the enormous flies that infested the place. They were larger than the largest hornet that I have ever seen—to be definite, the largest measured from head to tail 1½ in., and they were fat in proportion. They buzzed about in a way positively alarming, and, indeed, there was some reason to fear them, for if they got a good hold, so as to bite, they drew blood. Fortunately, they were so very noisy that we could keep a fair look out against them; but now and then one of us would leap up with a sharp cry, having been bitten—perhaps through the shirt. It is curious how differently different insects affect different people. Mosquitos bite me cruelly, making great swellings that last often for a week. These gad-flies, beyond the first pain of the bite, had no effect on me. Dr. Got, on the other hand, is (compared with me) indifferent to mosquitos; but the gad-flies made great swellings wherever they bit him. The poor horses suffered the most. When we arrived at Zunsainuma their bellies were streaming with blood. The scenery at Zunsainuma is very beautiful; but, unfortunately, all my exposures were made on those execrable plates that I have spoken of, and gave useless results.

Although the distance from Hakodatte is so small, this place is quite out of the world. It is inhabited only by a few people living in cottages around the banks of the lakes. These speak a dialect so different from pure Japanese, that even my Japanese friends could scarcely understand them.

A curious industry I observed here. There grows over a great part of the lake a kind of water plant, the leaves of which, at maturity, reach the surface and float there. The immature leaves which are a certain distance under the surface are eaten, and are considered a delicacy. They are collected by women, who paddle about on the water in canoes hollowed from the trunk of a tree in true Robinson Crusoe style. So curious are these canoes that I have spent a great deal of labour in attempting to remove the spots from a negative I took of a couple of them, and to make the print presentable, a thing which I have been barely able to do. The women lie on their faces with their arms over the stern of the canoe, and feel about in the water for the young shoots.

## REDUCING THE DENSITY OF NEGATIVES BY VARIOUS AGENTS.

BY CHARLES EHLMANN.\*

OVER-DEVELOPED negatives yield hard prints, no matter how long sensitized paper may be exposed to light under them; but such negatives can be reduced to normal density, either locally or over the entire surface. To do this properly is as easy and as difficult as any of the important photographic operations requiring skill, circumspection, and a close observance of the process while it is going on.

When we first became acquainted with gelatine emulsion plates, owing to want of practice and experience many errors were made in the development, and in the majority of cases we produced but very feeble negatives from which, to make good printers, we learned to intensify. Others, however, were so excessively intense that printing from them in a reasonable space of time was quite impossible. To reduce undue density we resorted in the beginning to an old remedy that had served us well in the collodion process—a strong solution of cyanide of potassium, to which was added, occasionally, a trace of iodine.

To a certain degree this remedy proved to be quite efficient, but as its action is slow, and commercial cyanide of potassium invariably contains as much as from 20 per cent. to 25 per cent. of carbonate or hydrate of potassium, the gelatine film weakened under its action to such an extent that it sometimes even became detached from the glass plate entirely, resulting, of course, in a loss of the negative. The method might answer, however, if a chemically pure cyanide of potassium could be obtained.

To convert the excessively strong deposit of metallic silver into iodide of silver by means of an iodine solution, and subsequent refixing in hyposulphite of soda, is, theoretically, quite correct, but can be done only with much care and attention by an experienced operator. The method is worthless when the reduction to iodide has been carried on but a trifle beyond the proper point. The hypo bath must necessarily take off more of the silver haloid formed than was intended, the negative becoming, as a consequence, too feeble for printing.

Not much better did we fare with the method of reducing the silver deposit to chloride of silver by means of weak solutions of ferric chloride. With the subsequent refixing in hypo, no more reliable results can be secured with this method than with that of iodide of silver. It is true that the conversion of the metallic deposit into chloride of silver has proved to be very useful in removing green and red fog, or discolourations of the film, excepting those caused by sulphides formed, but before a print can be made from the negative thus transformed into chloride, a re-development with ferrous oxalate must be resorted to, which, however, by no means reduces the original density of the plate, but increases it very perceptibly.

Reducing through the transformation of the silver into chloride is risky, for many reasons. To judge approximately correct of the degree of the reduced intensity before refixing the plate requires a most experienced eye. An insufficient amount of chloride formed necessitates a repetition of the process, and when it is excessive, the whole proceeding results in a failure and the loss of the negative. If the negative has been primarily perfectly washed, the transformation into chloride of silver progresses uniformly and slowly, but the presence of a mere trace of hyposulphite of soda is an obstacle to success. Ferric salts (ferric chloride) are reduced to ferrous by hyposulphurous salts, and if the negative has not been totally freed from the fixing agent, reduction into chloride can take place but imperfectly or not at all.

Reducing agents containing principally iron chloride and similar substances have been frequently proposed for practical use, and are, in fact, prepared and sold with great praise of their virtues. Apparently these media act well, slowly and uniformly, enough to allow of a perfect control, and with satisfaction to the casual observer. The chloride of silver formed, however, remains in the film, as it is not removed by fixing, as in the previous cases. What will become of a negative reduced in that way, and if a large edition is to be printed from it, I leave to every printer to decide.

Cupric chloride, formed when cupric sulphate and sodium chloride is applied to the negative, is just about as unreliable as any of those previously mentioned. The action is based upon

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the same principles. Owing to the copper salt, the deposit formed assumes a non-actinic colour, and unless the silver chloride is fixed away, and not even then, can great success be expected from the process. Dr. Eder has constructed a negative reducer, consisting of cyanide of potassium, iodide of potassium, and mercuric chloride. Its action is similar to those we have considered, but an excess of cyanide of potassium dissolves the respective chloride, cyanide, and iodide of silver formed, thus effecting the desired reduction of the negative deposit. Eder's solution is easily controlled in its action, but the reduction takes place slowly, an hour, or even longer, being requisite to reach the desired effect. Hence this process, with all its advantages, can never become quite popular in a very busy laboratory.

Farmer's solution, consisting of a mixture of ferricyanide of potassium and hyposulphite of soda, is probably the most generally accepted method to reduce over-intensity in negative deposits, as well as in printed paper proofs. It is controllable and safe, leaves no colour-stains behind, and acts with such an energy that, after a short application, the whole silver deposit may be totally destroyed, leaving upon the glass a pure gelatine film without the least trace of an image. When ferricyanide of potassium, itself sensitive to light, is mixed with hyposulphite of soda and then exposed to diffused light only for a short time, the mixture will turn blue, and, owing to a separation of sulphur, turn milky. A part of the ferric salt is reduced to ferrous, hydroferricyanic acid formed, sulphur, Prussian blue, and probably hydroxide of iron, separated. Under the influence of light Farmer's solution will soon become inactive, and should therefore be applied only in the dark-room, or in a much-subdued light. With proper precautions the solution has proved to be extremely active, and as its energy can be well controlled with the greater or less amount of the ferricyanide of potassium used, it has been almost universally adopted. The process is truly chemical, the ferricyanide of silver forming is dissolved in the hyposulphite of soda.

As a reducer for negatives it is effective when the general density of the plates requires modification, or when only a local reduction is desirable. The solution, mixed with strong gum arabic mucilage, and applied with a soft brush to the parts to be reduced, gives, with a little care and dexterity, all desirable effects. Halation marks, excessively developed whites, and even flare spots or ghosts, have been removed or subdued by it. For the reduction of paper prints, it is best to soak them in hypo solution, and add gradually to it but small portions of the ferric salt.

Less successful has been its application to the Eastman permanent bromide paper, which, more or less, assumes a yellow tone with it; the method now to be spoken of giving more satisfactory results.

Not less effective than Farmer's solution, and preferable to it in many respects, is the method with potassio-ferric oxalate, proposed by Monckhoveu, introduced and made practical by Belitski. Its peculiar virtues are that even by long-continued action no trace of colour is left behind, therefore is more useful in reducing gelatine paper prints, like those upon the Eastman paper. It acts probably slower but more steadily than Farmer's solution, but as the action begins only when the entire film has been penetrated by it, reduction must not be carried to exactly the degree of intensity required, but somewhat below it; the solution continuing to act within the film for some time after the operation has been interrupted by washing the plate. Potassio-ferric oxalate is the beautifully green crystallized double salt of ferric-oxalate and oxalate of potassium, which is formed by oxidizing our ordinary ferrous-oxalate developer. If this highly energetic developer is exposed to air but a short time, the active ferrous salt takes up more oxygen, becomes ferric, and ceases to be a developer. Hence, old or partly oxidized developer is quite frequently used as a restrainer, or to commence the development of plates suspected of over-exposure. By higher oxidation the oxalate developer loses part of its energy (ferric-oxalate does not develop). If, therefore, the ferrous salt remaining in the solution in lower quantity does the work, would it not be as well to apply for this purpose a freshly prepared ferrous solution containing an amount of the iron salt equivalent to that existing in the oxidized solution? But this does not seem to be the case. A peculiar virtue is displayed by the salt of higher oxidation; it possesses a restraining power by which most excessive over-exposures can be well controlled. The ferric-oxalate does not develop; it restrains, and will ultimately, under certain conditions, reduce the metallic silver deposit on plates developed with any of the known developers.

Before we consider the action of this reducer, it may be as well to describe the sources from which the valuable and beautiful salt is obtained, the more so as many practitioners have been prevented from using it on account of its scarcity, or by being ignorant of its mode of preparation. Old oxalate developer exposed to air in open vessels will, after a short time, deposit potassio-ferric oxalate in the form of green crystals; it will do quite well to separate them from the solution, remove the brown iron oxide adhering by washing in water, dry the crystals between bibulous paper, and preserve them for use. But if it is desirable to recover the whole quantity of the salt, proceed as follows. Take the whole amount of old developer on hand, pour it in an evaporating dish, and allow it to evaporate spontaneously in a subdued light. The resulting brown, powdery mass, interspersed with a multitude of green crystals of various size, is then to be mixed with one-tenth or one-fifteenth of its weight of crystallized oxalic acid, and, with five or six times its volume of water, boiled in an evaporating dish. The resulting thick and muddy liquid is filtered into another evaporating dish while yet hot, the dish covered up with paper, and set aside in a cool place over night. From it form beautiful crystals of a pure emerald-green colour—the potassio-ferric oxalate.

The salt is sensitive; light reduces it again to ferrous-oxalate; it must, therefore, be kept in the dark. The salt can also be prepared by adding to a weak solution of ferric-chloride another weak solution of neutral oxalate of potassium, filtering the solution, and crystallization. It is necessary to add enough oxalate to secure perfect neutralization. An excess of it will soon precipitate; an excess of iron chloride renders the resulting salt unfit for use.

The formula for reducing is simply to take 10 parts of the green crystals in weight, previously dissolved in as little water as possible, and add it to 100 parts of the ordinary hypo solution. When an over-intense negative is subjected to this compound, the reduction will take place slowly but perceptibly, and the process can, therefore, be easily controlled. The hyposulphite plays an important part. Without it the potassio-ferric oxalate does not reduce. A negative perfectly free from hypo may rest in a pure solution of the green salt indefinitely without any apparent effect. Remove the negative to a very weak solution of hypo, and reduction will commence at once. Hence it will be apparent that washing after fixing is not at all necessary when the negative is to be reduced.

The chemical process taking place has not been definitely stated, but the method is so secure, controllable, and in no case discolouring the plate, that it may well be considered of much practical value, more valuable, perhaps, than any other reducer.

I must not omit to mention, in connection with the chemical reducers which we have considered, one whose action is merely mechanical. I refer to the method of rubbing down excessive intensity by means of a linen rag moistened with alcohol. Friction reduces density by taking off particles of the silver deposit. The intelligent negative retoucher can by this means produce very fine effects, and make visible modulation quite obscured upon the crude negative.

### MONEY IN THE CAMERA.

"No, I do not think that amateur photography is supplanting out-door sketching," said a well-known dealer in artists' material a few days since, in response to a question.

"While I do not say that the converse of that proposition is true, I do know, for a fact, that a larger number of sketching classes have gone into the country this summer than ever before, and, as a rule, these classes have had a very large membership. It is a theory of mine, which, I think, can be readily demonstrated, that there is really no reason why the sketch artist and amateur photographer should not work in perfect harmony, and that the union will be greatly to the benefit of both.

"I can give you an instance," he went on, "where the camera has been of untold service to one of the artists on a well-known magazine. Formerly this artist, of more than local renown, used to sketch wholly from nature; but now, when making a tour through England, Scotland, or where he may chance to be, he always carries his camera along, and when he comes across a pretty bit of landscape, a ruined castle, or anything else he wishes to preserve, he at once takes a negative. Thus you see that in a few weeks' time he can take hundreds of negatives, while months will be consumed on his tour if he were compelled to sketch each view himself. When he reaches home he throws



the negatives on to a piece of cardboard, touches them up with India ink, then in some way decomposes the silver on the plate, leaving the India ink drawing in its place. The drawing is then photograyed, and is published in the magazine as a bona sketch, while, in fact, it is purely a piece of mechanical work.

"To my mind, however, that does not detract from the beauty of the work, and it goes to show what I said in the beginning, that amateur photography, instead of being an enemy of the artist, is actually his best friend, notably in the instance I have cited, where Mr. — is enabled to add from \$5,000 to \$10,000 per year to his income.—*Detroit Free Press.*

### ORTHOCHROMATIC PHOTOGRAPHY.

BY C. H. BOTHAMLEY, F.I.C., F.C.S.\*  
(Abstract.)

At the Glasgow meeting last year I had the honour of bringing before the Convention a brief history of orthochromatic photography up to that time, and an account of some of my own experiments in the same direction. Experiments with the spectrum not only confirmed the results of previous workers, but even showed that it is easy to make ordinary gelatino-bromide plates much more sensitive to the yellow and other rays of low refrangibility than to any part of the blue or violet. In order to ascertain whether plates thus prepared are of practical value, a series of comparative exposures was made. Various coloured objects—such as pottery, flowers, and paintings—were photographed under the same conditions of lighting on ordinary plates, and on similar plates which had been treated with a dilute ammoniacal solution of erythrosine. In the latter case a transparent yellow screen was placed between the object and the plate. The results showed that plates treated with erythrosine give much better results than it is possible to obtain on ordinary plates. At that time there was very little evidence as to the value of orthochromatic plates in landscape photography. The unaltered white light which is reflected in greater or less quantity from all coloured objects is always an important factor in the result, and tends to reduce the contrasts due to colour, especially if a full exposure is given. In landscapes the proportion of reflected white light is very considerable, and there was reason to suppose that the advantage of orthochromatic plates would not be so great as in the case of the various classes of objects previously cited. There were, however, equally good grounds for the supposition that considerable improvement might be obtained.

During the spring, summer, and autumn of last year, I made a series of experiments with a view to obtain information on this point. Paget Prize Plates XXX were immersed for two or three minutes in a one per cent. solution of liquor ammonia, and then for two minutes in a very dilute aqueous solution (1 in 10,000) of the *Erythrosine I.* of the Badische-anilin-und-soda-fabrik, to which one per cent. of liquor ammonia was added. The plates were allowed to drain with their edges on blotting-paper, and were dried in the dark. They will not keep in good condition for more than six or eight weeks. Development is conducted in ruby light.

When plates prepared in this way, or the commercial isochromatic or orthochromatic plates, are exposed on landscapes in the ordinary way, without any yellow screen, the results are little better than those obtained with ordinary plates. There is a difference, and under favourable conditions (*e.g.*, towards sunset, when the light has become yellowish) it can be readily recognized, but the difference is only small, and is scarcely sufficient to repay for the necessity of using a dim red light when manipulating the plates.

The function of the yellow screen is to reduce the intensity of the blue and violet rays, to which the prepared plates are still too sensitive. The most convenient form is a film of collodion dyed with *aurantia*, a coal-tar dye, and gummed on the diaphragm of the lens. It should have a full lemon yellow colour, not too deep, and without any orange tint. If the screen is too deep in colour, too large a proportion of the blue and violet rays is cut off, the greens are rendered too light, and the distance becomes so distinct and heavy that all effect of atmosphere is lost.

The value of experiments of this kind depends upon whether the exposures have been made under strictly comparable conditions, and whether the ordinary plate has been made to give the best result that it is capable of giving. In the series to be

described the subjects selected were as far as possible typical; the exposures were made only on days when the light was practically constant for a considerable interval, and every endeavour was made to get the best possible result with the ordinary plates. Paget prize plates XXX were used for comparison, and the exposure given to the prepared plate with the yellow screen was from two to three times as long as that given to the ordinary plate without the screen.

A selection of the results was exhibited in the form of lantern slides, care being taken that the lantern slides were fairly representative of the negatives. All the views shown included foliage and water, and in most cases distance. Attention was especially directed to these points, and, incidentally, to the shadows under trees and overhanging rocks. The defects in ordinary landscape negatives are well known: the distance is not sufficiently distinct, and if there is only a slight haze the details are completely lost; the foliage, except under very favourable conditions of lighting, is flat, spotty, and much too dark in tone, and the different tints of green are not properly distinguished. The water is much too light, and is not unfrequently chalky, the half-tones and reflections being more or less completely lost. In the examples exhibited, the negatives on ordinary plates showed all these defects to a greater or less extent, although an endeavour had been made to minimise them by careful attention to exposure and development. The same views on the prepared plates (with the yellow screen) showed very considerable differences. The detail in the distances was much more distinct, whilst, at the same time, the distance was still low in tone, and thus the effect of atmosphere was not lost. In the vegetation the different tints of green were clearly distinguished, but the most noticeable difference was the improved roundness and massing of the foliage. The water showed no chalkiness, the half-tones were rendered much more satisfactorily, and the improvement in the reflections was in some cases very marked indeed. These differences are to be attributed in the first place to the sensitiveness to yellow, green, and orange, which is conferred on the plate by treatment with the ammoniacal erythrosine, and, in the second place, to the reduction of the intensity of the violet and blue rays by means of the yellow screen, which not only prevents blue and violet objects from appearing as white, but likewise prevents the injurious action of the slight bluish haze, which so frequently interferes with the proper rendering of a landscape on an ordinary plate. The advantages enumerated are accompanied by certain minor disadvantages. Plates prepared with the ammoniacal erythrosine bath are somewhat too sensitive to green, and hence, if the yellow screen employed is too deep in tint, the greens in the picture are relatively too light. With a proper screen this defect is not apparent, and it may be avoided by using an erythrosine bath without any ammonia, or by adding the erythrosine to the emulsion, as described in the Tailler specification. In the latter cases, however, the sensitiveness of the plates is not so great, and a considerably longer exposure is required. At the same time the sensitiveness to orange is lower than when the ammoniacal bath is used. In some of the subjects, it was noticeable that the shadows under the trees and overhanging rocks were darker on the orthochromatic plates than on the ordinary plates—the latter, in fact, giving the better rendering. This has previously been observed and explained by Vogel. The shadows in question are almost exclusively lighted by reflected light of a more or less bluish character, and when the yellow screen is employed, the intensity of this light is too much reduced, and consequently the shadows appear too dark. The remedy is obvious: a paler screen must be used, or if the exposure is made towards sunset, and the light is very yellow, the screen may be dispensed with altogether.

A series of experiments is in progress with a view to ascertain the relative merits of the various methods of employing erythrosine, namely, in the emulsion, as an ammoniacal bath, as an aqueous bath, and in the form of silver erythroside, either as a bath, or in the emulsion. These experiments are not yet complete, and a report will be made subsequently, but sufficient evidence has been obtained to show that, although the Obernetter-Vogel plates, which contain silver erythroside in the emulsion, and are said to work without a yellow screen, do undoubtedly give results much better than those which can be obtained on ordinary plates, they are not equal to the results obtained with plates prepared with an ammoniacal erythrosine bath and used with a yellow screen. If, however, these silver erythroside plates are used with a pale yellow screen and a somewhat longer exposure, they will be found to give very satisfactory results. They have not yet been in the market for a sufficient length of

\* A Communication to the Photographic Convention.



time to enable me to form any trustworthy opinion as to their keeping qualities.

Photographers are not wanting who express a preference for the landscape results obtained with ordinary plates over those obtained with the orthochromatic plates. This arises partly from want of familiarity with the newer results, and is a further example of the dislike which human nature always shows to a change from anything which has become familiar. It must be admitted, however, that if the orthochromatic plates are used with too deep a screen, the results may be just as incorrect in one direction as those on ordinary plates are in the other. Orthochromatic processes must, in fact, be used with a large amount of judgment. A very important point, however, is this: landscape photographers have been accustomed to obtain the dark masses necessary to the harmony of their pictures, not from true shadows, but by taking advantage of the imperfect rendering of greens and yellows. With orthochromatic plates, however, this imperfect rendering disappears, and masses of deep tone can only be obtained from true shadows. In other words, a different manner of lighting, and in some cases even a totally different point of view, must be adopted.

The second question investigated was the relative sensitiveness of the various commercial orthochromatic plates, and plates prepared by the different bath processes. The results so far obtained must be regarded as merely preliminary, as the experiments are still in progress. The standard light employed was the Siemen's unit lamp, or amyl-acetate lamp, which is one of the most trustworthy standards known. It is similar in form to an ordinary spirit lamp, but the liquid burnt is amyl-acetate, and the height of the flame is regulated to five centimetres. A Warnerke sensitometer screen was employed as a measure of sensitiveness, the distance between the light and the screen being one metre. Immediately in front of the screen was a glass tank with parallel faces containing a one per cent. solution of picric acid, the thickness of the layer of liquid being two centimetres. The light which passes through this thickness of solution is composed exclusively of the less refrangible rays, i.e., green, yellow, orange, and red. Examination with the spectroscope shows that the absorption extends to about the Fraunhofer line *b*. Light of this character and intensity has no effect on a Paget XXXXX plate, even after an exposure of one minute. The plates to be tested were exposed fifteen seconds, and were then developed all together in the same dish for three minutes with a developer which contained in each fluid ounce two grains of pyro, one grain of ammonium bromide, and three minims of liquor ammonia. The numbers given are the mean of two concordant series of observations:—

Plate.	Sensitometer Number.
Vogel's azaline emulsion (Perutz) ... ..	7
Edwards's instantaneous with aqueous erythrosine 1 : 10,000 ... ..	9
Paget XXX with cyanin and ammonia (Schuman) ...	9
Tailfer isochromatic (red label) ... ..	10
Paget XXX with aqueous erythrosine 1 : 10,000 ...	13
Wratten's ordinary with ammonia and erythrosine 1 : 10,000 ... ..	13
Edwards's isochromatic... ..	14
Paget XXX with ammonia and rose bengal 1 : 10,000	15
Paget XXX with ammonia and azaline (Vogel) ...	15
Thomas's T C L with ammonia and erythrosine 1 : 10,000 ... ..	19
Obernether-Vogel silver erythrosine emulsion (Perutz)	19
Paget XXX with ammonia and erythrosine 1 : 10,000	22
Paget XXXXX with ammonia and erythrosine 1 : 10,000 ... ..	22
Paget XXX with ammonia and silver erythrosine 1 : 10,000 ... ..	22
Edwards's instantaneous with ammonia and erythrosine 1 : 10,000 ... ..	25

The end and aim of orthochromatic photography is to represent coloured objects with their true "values," i.e., with shades of monochrome, the different depths of which shall truly represent the different degrees of brightness of the object or objects as they appear to the eye. The question at once arises which of the various methods hitherto proposed most nearly attains this end? It is necessary to bear in mind that the author is dealing with gelatine plates only, and expresses no opinion as to the relative merits of the processes with gelatine and those with collodio-bromide emulsion.

In the first place it may be well to point out that in dealing

with "values," we are dealing with subjective phenomena which do not admit of accurate quantitative measurement. The eyes of different people differ in their relative sensitiveness to different colours, and hence, of course, the "values" of one and the same subject will be slightly different for different observers. As a rule, however, the variations are not great, and there is a general agreement as to what are correct values, just as there is a general agreement as to what is good composition and chiaroscuro. At the same time we must confine ourselves to the general character of the results, and neglect small differences of detail.

Experiments with the spectrum, and a comparison between the sensitiveness of the eye and of various orthochromatic plates to different parts of the spectrum, indicate, in the first place, that no orthochromatic gelatine plates hitherto prepared will give correct values unless the intensity of the blue and violet rays is reduced by means of a yellow screen, since they are all relatively much too sensitive to these rays. Further, it is seen that an ammoniacal erythrosine bath gives the greatest sensitiveness to yellow, a considerable degree of sensitiveness to orange, but an excessive sensitiveness to yellowish green and green; an aqueous erythrosine bath, or erythrosine added to the emulsion, as in the Tailfer specification, gives less sensitiveness to green, but also less sensitiveness to orange; ammoniacal rose Bengal imparts sensitiveness to yellow, and in a lower degree to green and orange, and the curve representing the effect of this dye corresponds with the curve representing the action of the spectrum on the eye more closely than the curve for any other single dye; ammoniacal cyanine imparts relatively too much sensitiveness to orange, and too little to yellow and green. A comparison of the different curves representing the effect of the spectrum pointed to the probability that a mixture of rose Bengal and cyanin would give results closely approaching a true orthochromatic effect, and that the same mixture, with the addition of a much smaller proportion of erythrosine, would probably be still better. A long series of comparative experiments was made with a colour chart and with the two well-known chromo-lithographs, "Bubbles" and "Playmates." The pictures are almost hopeless with ordinary plates, and afford a severe test of the merits of the orthochromatic plates. The colour chart consists of three distinct bands of coloured paper, with six colours—red, orange, yellow, green, blue, and violet in each band. The colours employed were as saturated and pure as it was possible to obtain, and any influence of the nature of the surfaces of the different papers was eliminated by using three distinct bands, with different papers in each band. Especial care was taken that the yellows reflected as little white light as possible, and were free from orange or green; also that the blues, although saturated, should be free from admixture with black. Three distinct series of exposures were made on this colour chart, no yellow screen being employed. Twelve different varieties of orthochromatic plates were employed in each series. These included the different commercial plates used in the photometric experiments, viz., Edwards's isochromatic emulsion, azalin emulsion, and Obernether-Vogel silver erythrosine emulsion, together with plates prepared by nine different baths. In one series the bath plates were Paget XXX; in the second, Edwards's instantaneous; and in the third, Wratten's ordinary. The exposures were timed in accordance with the results of the photometric experiments, and the results were precisely similar in all three series. In the case of the pictures only four kinds of plates were compared, and they were all exposed with a yellow screen, viz., Edwards's isochromatic; ammoniacal erythrosine bath, 1 : 10,000; ammoniacal rose Bengal bath, 1 : 10,000; and, a bath containing rose Bengal, 1 : 10,000; cyanin, 1 : 20,000; erythrosine, 1 : 20,000; absolute alcohol ten per cent., and ammonia, one per cent.\* A series of exposures with a number of different plates, with or without a yellow screen, were also made on a blue vase containing daffodils (white, yellow, orange yellow).

The results were exhibited in the form of lantern slides, and may be summed up as follows:—An ammoniacal erythrosine bath does not sufficiently distinguish between different shades of yellow, and is too sensitive to green; an aqueous erythrosine bath, though requiring longer exposure, gives somewhat less sensitiveness to green, and, on the whole, distinctly more correct values. The results with Edwards's isochromatic plates are practically identical with those obtained with plates treated with

\* In all the bath processes the strength of dye solution was 1 : 10,000, except where otherwise specified, and the proportion of liquor ammonia added, if any, was one per cent. The plates were immersed for two minutes, drained but not washed, and dried in the dark.



aqueous erythrosin. An ammoniacal rose Bengal bath gives still better values; cyanin gives good values, but the sensitiveness to yellow is somewhat too low. With azalin in the emulsion the results are practically the same as with cyanin, but the rendering of the yellow is somewhat better. A mixture of rose Bengal and cyanin gives slightly better values than either separately, and the same is true of the mixture of rose Bengal, erythrosin, and cyanin, but the differences are only recognisable on very close inspection and comparison. On the whole it may be said that rose Bengal, in the form of an ammoniacal bath, although giving less sensitiveness than a similar bath of erythrosin, nevertheless gives better values that can be obtained by the use of any other single dye. It will be observed that these results are in complete agreement with the deductions from the results of the experiments with the spectrum.

It is important to bear in mind that with all gelatine orthochromatic plates introduced up to the present a yellow screen is essential if a close approximation to correct values is desired. If it is not used, blue and violet objects are always considerably too light. In fact, the screen is a very important factor in determining the character of the result, and places great power in the hands of the operator. By increasing the depth of tint of the screen a greater and greater proportion of the blue and violet rays is cut off, and a greater and greater prominence is given to the yellow, orange, green, &c. At the same time, of course, a longer exposure is required. When dealing with difficult colours, such as dark orange and reds, a deep screen must be used, with a proportionately longer exposure, and cyanin alone, or in conjunction with some other sensitizer, must be employed.

For landscape work erythrosin may still be regarded as the best sensitiser, a yellow screen, not too deep in tint, being employed.

NOTE.—In order to avoid the misconceptions which have attached themselves to Vogel's original term "optical sensitizers," the author proposes to abolish it in speaking of dyes or other substances which may be used for the production of orthochromatic effects, and to substitute the term "selective sensitizers," which expresses the fact that these substances make the plate sensitive for particular rays only, without involving any particular view as to the exact way in which the sensitising action is brought about. This term will be used in any future communications that the author may make on this subject.

## Patent Intelligence.

### Applications for Letters Patent.

10,365. WILLIAM HARDING WARNER, St. Augustine's Chambers, Unity Street, College Green, Bristol, for "Improvements in the construction of supports for photographic pictures, plates, or films while under manipulation."—July 27, 1888.

11,131. HARRY WHITFIELD, 63, Broad Street, Birmingham, for "Improvements in holders, clips, or easels for photographs, mirrors, photograph frames, cards, and other articles."—August 1st, 1888.

11,142. HENRY PORTER, 181, Strand, London, for "A new form of camera microscope styled a Lucerna camera microscope and cosmorama lantern."—August 1st, 1888.

### Patents on which the Fourth Year's Renewal Fee has been Paid.

6,658 of 1884. S. D. McKELLEN.—Cameras.

8,463 of 1884. S. D. McKELLEN.—Cameras.

### Specifications Published.

7,556. OTTO KREBS, of Pittsburg, in the county of Allegheny, Pennsylvania, in the United States of America, Lithographer, for "An improved process of transferring prototypes to lithographic stones."—Dated May 22nd, 1888.

My invention relates to an improved process of transferring prototypes to lithographic stones, and it consists in printing an image by means of a photographic negative upon a plate which has been suitably prepared to receive the image, then taking an impression from the plate upon a sheet of paper which has been saturated in a solution of gelatine, chloride of calcium, glycerine, chromate of alum and water, and then the impression so taken on the paper from the plate is transferred to a lithographic stone, all of which will be more fully described hereinafter.

A photograph is taken of the object, the image or likeness of

which is to be transferred to the lithographic stone. A plate of any suitable material is then taken and coated upon one side with a solution of the proper consistency composed of albumen, soluble glass, and filtered water. The plate is dried after having been coated with this solution, and is then washed for about thirty minutes with filtered water, and again left to dry. After having been dried the second time, the plate is exposed to a heat of about 45° R., for a suitable length of time, and is then given a second coat with a solution of gelatine, bichromate of potash, bichromate of ammonium, alum, and filtered water, and is again exposed to a temperature of about 45° R., to become heated.

The plate thus prepared is exposed to the light under the photographic negative, and after having remained exposed to the light passing through the negative a sufficient length of time to make the desired impression, the plate is again washed with water containing ammonia and alum. The plate is then removed to a lithographic press, and inked in with a roller in the usual manner; the ink used for this purpose consists of wax, tallow, resin, mastics, varnish, and lamp-black.

A sheet of paper of suitable size is then saturated in a solution of ten parts of gelatine, five parts of chloride of calcium, two parts of glycerine, five parts of chromate of alum, and water enough to give the solution the proper consistency. After the paper has been dried, it is moistened in a weak solution of water and tannin to harden it, and to prevent it from sticking. The sheet of paper is then placed upon the plate in the lithographic press, and the image on the plate impressed upon the paper. The impression thus obtained is transferred to a suitably prepared lithographic stone, and the work on the stone is dampened with water containing a little muriatic acid. Then the stone is covered with a thin solution of gum arabic, left to dry an hour or two, when it is inked with printer's ink, and is ready for the lithographic press to be printed from in the usual manner.

The preparation of the plate is conceded to be old, and no invention is claimed for this part of the process.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:

The process of transferring prototypes to lithographic stones consisting in first, taking a photograph of the object; second, printing the photographic image of the negative upon a plate which has been suitably prepared; third, taking an impression from the plate upon a sheet of paper which has been saturated with a solution of gelatine, chloride of calcium, glycerine, chromate of alum, and water; and fourth, transferring the impression from the prepared paper to the lithographic stone, substantially as set forth.

12,521. JOSEPH BROWN, Cluny Lodge, London Street, Norbiton, Kingston-on-Thames, Surrey, Artist, for "Improvements in the preparation of films for photographic purposes in monochrome or polychrome."—Dated September 15th, 1887. Complete Specification.

This invention relates to the preparation of gelatine and other flexible gums on a temporary flexible support or basis which temporary support is finally removed after the photographic image has been obtained either in its monochromatic condition or after colours has been applied, and then transferred to a rigid support such as card, glass, wood, or any other suitable material.

The manner in which I carry out my invention is as follows: I take a sheet of paper or other suitable flexible material. On this flexible material I lay a coating of gelatine rendered insoluble; when dry, I lay another coating of liquid caoutchouc or india-rubber, to which I add a mineral oil, or grease or wax. When dry, I then coat with a solution of cotton-wool that has been prepared with acid and dissolved in ethereal alcohol. After this is dry, I again coat it with a solution of gelatine either clear or coloured, and on the surface of this layer of gelatine I place a layer of bromide of silver emulsion. I sometimes omit this thin layer of gelatine, and place the bromide of silver emulsion direct on the preparation of the dissolved cotton-wool as above. The prepared bromide emulsion surface is ready to receive the monochromatic photographic image. I proceed for the polychromatic to place colours at the surface of the monochromatic image before removing the film of gelatine and gums from its flexible support after the colours are dry. I proceed to transfer the film on to a rigid support, and then remove the flexible temporary support.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—



The process herein mentioned in the preparation of gelatinous films for photographic purposes in monochrome or in polychrome as herein set forth.

#### Patents Granted in America.

386,571. ALEXANDER ANDERSON, Elgiu, assignor of one half to George Whyte, Northview, Scotland, for "Photographic bath."—Filed August 11, 1887. Serial No. 246,674. (No model.) Patented in England Sept. 17, 1885, No. 11,020.

*Claim.*—1. The combination, with a photographic bath dish, of a finger pivoted to the bath dish and adapted to lift the plate out of the solution contained by the dish, substantially as specified.

2. As an improved article of manufacture, a rocking bath dish consisting of the dish, provided with the pivotal projections, and the finger, hinged to the side of the dish and adapted to lift one end of the plate out of the solution contained by the dish, substantially as specified.

### Correspondence.

#### THE YELLOW SCREEN IN ORTHOCHROMATIC PHOTOGRAPHY.

DEAR SIR,—I have recently made some experiments with so-called orthochromatic plates, and my conclusions respecting them so closely coincide with the opinions expressed by Mr. Ives in this week's PHOTOGRAPHIC NEWS, that I thought you might care to see one of my results. The plates I used were procured from one of our oldest and best known makers. I first tried them for ordinary landscape work, and as I could find no advantage in them for this purpose, I arranged the group of objects of which I send you two prints, one taken from an ordinary, and the other from an orthochromatic plate. I have numbered them 1 and 2, and shall be glad to hear if you can decide which is which. The objects in the group were carefully selected as regards colours. The design on the china plate is in yellow and blue-grey; the flowers were red, blue, white, and yellow; and the books black, red, blue, green, and brown. I cannot speak with respect to the plates of other makers, but so far I am disposed to think that an orthochromatic result can only be obtained by means of a yellow screen, and that, with this adjunct, any sensitive plate will yield orthochromatic results.—Yours truly,

Appleton, Wilnes, Aug. 4th. VERO C. DRIFFIELD.

### Proceedings of Societies.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE usual weekly meeting was held on the 2nd inst., J. TRAILL TAYLOR in the chair.

W. COBB exhibited a 15 by 12 silver print of the Convention group, taken at Birmingham on the previous Saturday.

A print from a negative of the same group, taken by T. Scotton, was shown by the Chairman.

T. KERR also exhibited a series of views taken during the Convention week with a detective camera.

F. A. BRIDGE passed round an enlargement from a quarter-plate negative of a group taken at Birmingham by the flash-light.

J. B. B. WELLINGTON showed a series of negatives and lantern slides.

The various exhibits were viewed with much interest by the members present, and a discussion on the various places visited by members attending the Convention followed.

The CHAIRMAN gave an account of his visit to Dudley. In this town scarcely a house stood in a perfectly vertical position, owing to the subsidence of the ground caused by coal mines under the town.

At the request of the Chairman, J. B. B. Wellington, F. Cembrano, and H. M. Hastings—as delegates appointed to represent the Society at Birmingham—severally spoke of their experiences, and at the same time gave a brief account of the proceedings during the week.

THE HON. SECRETARY said the enthusiasm which members of the various provincial photographic societies showed when it was understood that London was selected in which to hold the Convention the following year, augured well for its success. He believed a very large gathering would be the result.

W. H. HARRISON showed a basket knapsack which he had found most useful in travelling. It was sufficiently large to carry his photographic outfit, and, being strapped to his shoulders, could be carried a long distance without causing fatigue. The interstices of the basketwork allowed sufficient currents of air to pass to prevent the shoulders and back becoming uncomfortably hot.

J. WHITE exhibited a camera for photographing birds on the wing. It was mounted at the end of a gun stock, the trigger releasing the shutter. When pressed close to the shoulder in taking aim the apparatus could be held quite steady.

#### SHEFFIELD CAMERA CLUB.

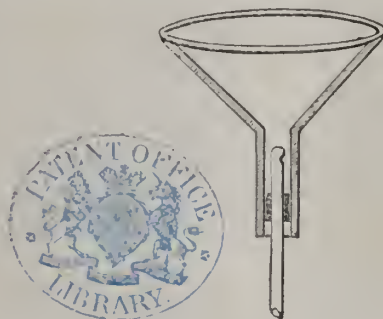
THE usual monthly meeting was held at the rooms of the Society, 8, Fitzalan Square, on Friday, Aug. 3rd. The chair was occupied by Dr. T. H. MORTON (President). There was a good attendance of members.

A ballot was held, and the following were elected members of the Society:—Frederick Stubbs, Albert Oakes, William Johnson, and Geo. Harry Whittaker.

The subject of "Printing and Toning" was dealt with, and practical demonstrations given by Dr. Morton and G. T. W. Newsholme.

### Talk in the Studio.

SEPARATING FUNNEL.—According to the *American Druggist*, Currier has devised the separating funnel shown in the accompanying cut. Through a cork inserted into the neck of a funnel, a glass tube is passed, the inner end of which is closed by fusion, and which has an opening (made by a file) a little below the



closed end. If this tube is pushed down so low that the opening is covered by the cork, nothing will flow from the tube. On pushing it upwards, the hole becomes uncovered, and will permit the passage of liquid through the tube.

DETECTION OF IMPURITIES IN COMMERCIAL ALCOHOL. By L. GODEFROY (*Compt. rend.*, 106, 1,018—1,020)—6 or 7 c.c. of the alcohol is agitated with one drop of perfectly pure benzene, mixed with 6 or 7 c.c. of pure sulphuric acid of 66°, and again agitated. If reducing "head" products are present, the liquid immediately acquires a coloration which gradually darkens for a few minutes, and varies from pale brownish yellow to black. Pure ethyl alcohol gives no immediate coloration, but after eight or ten minutes the liquid acquires a slight rose tint. This test will detect 1 c.c. of "head" products in 1,000 litres of alcohol, or 1 part per 1,000,000. The quantity may be estimated by comparing the colour with that given by alcohol containing a known quantity of acetaldehyde, and expressing the results in terms of the latter. If the liquid remains colourless after several minutes, no "head" products are present. In order to detect "tail" products, care is taken that the acid and alcohol are thoroughly mixed, in order to avoid polymerisation, and the liquid is boiled for a short time and then allowed to remain for several minutes. Under these conditions, pure ethyl alcohol gives an ochre-yellow coloration; but in presence of "tail" pro-



ducts the liquid acquires a brown colour with a green fluorescence, the depth of tint increasing with the quantity of impurity. This test is not so sensitive as the first, but will detect 1 part in 100,000. Neither of these tests is directly applicable to wines, spirits, &c. These liquids should be distilled, and the first fraction tested for "head" products, and the last fraction for "tail" products.—*Journal of the Chemical Society.*

**ALKALI AND ACID ALBUMIN-DERIVATIVES.**—By M. SAVIN (*J. Russ. Chem. Soc.*, 1887, 398-402).—The following are the results of the author's investigation. The so-called ammonium-albuminate of white of eggs, and the acid albumin obtained by the action of hydrochloric acid of 0.2 per cent. after precipitation with ammonium sulphate and subsequent dialysis, until all salt is removed and the reaction is neutral, are insoluble in water, but soluble in acids and alkalis. The solubility in salt solutions depends on the time which has elapsed since their preparation. When the dilute albumin solutions are made alkaline, and then digested on the water-bath with ammonia or with soda, the albumin is converted into globulin, but the conversion is incomplete. As regards their behaviour towards water, solvents, and reagents, the acid albumins are identical with the feebly alkaline derivatives of albumin (globulins) when in the form of pure precipitates. The same holds good with regard to ferments. The fact that globulins are obtained by "tryptonisation" seems to confirm the identity of globulins with albumins.—*Journal of the Chemical Society.*

**THE PERMANENCY OF WATER COLOURS.**—The *Pull Mall Gazette* says:—"The general effect of the report of the experts on the action of light on water colours is to establish the essential permanence of that medium. The experiments made by Dr. Russell and Captain Abney are conclusive, for the light to which they subjected their specimens was equivalent in intensity to the ordinary gallery light of centuries. The result of this test is to show that Sir J. C. Robinson was entirely wrong when he asserted that 'open and continuous exhibition ruins water colours in a very few years, by the very fact of such exposure alone;' and that Mr. Ruskin was entirely right when he said (agreeing with Sir J. D. Linton) that 'properly taken care of—as a well-educated man takes care of his books and furniture—a water colour drawing is safe for centuries.' This is a very satisfactory result. The essentially English art is not evanescent as the light it records, but permanent as the pleasure it imparts. And what is even more satisfactory is, that the experiments explain also the exceptions which really prove the rule. For there are some colours and some combinations of colours—notably those in favour with Fielding and De Wint—which do fade under sunlight; and secondly, the combination of damp with exposure produces fading where exposure alone does not. The artists, therefore, have only to choose their colours aright, and the owners have only to preserve the drawings aright, and water-colours will—as Mr. Ruskin said—be 'safe for centuries.'"

**TYLAR'S CURRENT PRODUCER AND SYPHON FOR PRINT-WASHING.**—The accompanying sketch represents the last clever device of that ingenious craftsman, W. Tylar, of Birmingham; a sort of syphon arrangement for providing in and out currents of water for print-washing. The spring shown between the



arms of the syphon serves to make it grip steadily on the side of the water-holding vessel, the long arm being outside. The horizontal nozzle shown at the top of the long arm is now connected with the water supply by means of an india-rubber pipe. When the vessel is full, the screw-valve at the top is opened until the in-current has aspirated all the air from the top bend of the syphon, after which the screw-valve is closed. We have an in-current so arranged as to set up a circulation, and an out-

current through the syphon. If the in-current stops, the syphon soon goes out of action, so the prints are not left dry.

**"A PHOTOGRAPH, AND HOW TO TAKE IT."**—We have received a new edition of this concise and well-written little Hand-Book, edited by A. A. Wood, and published by Horne, Thornthwaite, and Wood, of 416, Strand.

**SHEFFIELD CAMERA CLUB.**—An ordinary meeting was held on August 3rd (Dr. Morton presiding), when F. Stubbs, A. Oates, G. H. Whittaker, and W. Johnson were elected members. The subject of the evening, "Printing and Toning," was introduced by the Chairman, who gave a description of the different processes. The toning of silver prints was then demonstrated. Dr. Morton used a solution of terchloride of gold and soda acetate of ordinary strength gr i 5j in half a pint of water, and recommended it as most reliable if not kept too long. He thought the highly albumenized paper resisted the toning action. G. F. W. Newsholme toned some prints on Aristotype paper with sulphocyanide, gold, and hypo. He got good results, but found the toning sometimes rather energetic. H. Rawson brought a fine collection of toned and untoned prints. He prepared the acetate of soda formula, and ensured a uniform agreeable tone by using a fresh supply for each batch of prints. C. Winder exhibited several good micro-photographs, and Mr. Barraclough landscape prints. Owing to the unfavourable weather the excursions have been postponed.

**PHOTOGRAPHIC CLUB.**—The subject for discussion on August 15th will be "Printing on Matt and Chloride Paper." Saturday outing at Thames Embankment, meeting afterwards at Gatty's.

## To Correspondents.

\*. Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

**PHOTARGUS.**—1. It would be very interesting to have an investigation by such a person as regards the points mentioned. 2. Full particulars have recently appeared.

**R. L. C.**—The PHOTOGRAPHIC NEWS being in no way the organ of the Association referred to—or, indeed, of any other Society, Committee, or Convention—there is no means of putting pressure upon it as to the kind of report given. Hence the remarkable difference noticed by yourself and others.

**E. WILLIAMS.**—One of the sheets of paper sent is streaky and unequally coated, and, moreover, the inequality shows in the finished prints. So far it is defective, and you may claim recompense from the manufacturer on account of his carelessness. Each sheet sent gives vigorous images, and, apart from the inequality of the coating of one piece, all is satisfactory. The worst defect in the prints you send is a very offensive patchiness about the sky in the case of two of the architectural subjects; but this looks as if due to some unfortunate accident having happened to the negatives.

**ALEX. J. SIMPSON.**—Probably about seven shillings a dozen.

**WM. COLES.**—1. If the artist whom you employed to paint your background agreed to paint it of a certain well-defined and clearly understood degree of darkness, and it was "too light" by the terms of the understanding, you can bring legal pressure to bear on him to fulfil his agreement, or pay you compensation, provided, of course, that you can establish the facts of the case to the satisfaction of the Court. 2. Writing to the artist and "threatening to put a notice in the NEWS," is a course which we think an error of judgment on your part. 3. We have nothing to do with the advertisement department, and all communications relating to it should be sent to Piper and Carter. We will hand over the copy and postal note to them; but we do not think it likely that they will insert your advertisement.

**CHARLES KINGSTONE.**—The photograph is a very pretty one, and the result should encourage you to persevere.

**DR. MORTON.**—Thank you for the notice. If it had been sent a day earlier we could have given it a more prominent position.

## The Photographic News.

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### ORTHOCHROMATIC PHOTOGRAPHY.

THE reproduction by photography of coloured objects with a more just representation than that given by the silver haloids in their ordinary state—which, for want of a better name is called orthochromatic photography—is exercising the minds of photographers just now in a remarkable degree. For some time past the attention of scientific investigators has been turned in this direction, and the outcome of their experiments has been from time to time published for the edification and use of others; and recently several varieties of colour sensitised films have been commercially introduced. If any evidence of the growing interest attached to this department of photography were wanting, it would be found in such facts as that several papers were devoted to the subject at the recent Convention, and that in the current number of the *Photographische Mittheilungen* there are three important communications, all bearing upon this development of photography.

The first of these communications is from Dr. Wollheim, and is upon the photographic properties of chlorophyll. Although Dr. Wollheim's experiments are not as yet complete, he thinks that, having arrived at certain results, it is desirable to publish these without waiting for the conclusion of his researches. He notes, in the first instance, the difficulty of impregnating a gelatine plate with chlorophyll, this substance being absolutely insoluble in water and in ammonia. "When a freshly prepared alcoholic solution of chlorophyll is carefully diluted with a large quantity of water, although the specific absorption spectrum is retained, the solution no longer fluoresces, but shows a certain opalescence. The chlorophyll being no longer in solution, but in a fine state of suspension, is not in a fit condition for an even impregnation of the plates." He, however, succeeded by making a solution containing one part of fresh chlorophyll tincture and five parts of water with a little ammonia. Plates prepared with this solution succeeded equally well, wet and dry.

Finding that phyllocyanin (Fremys' phyllocyanic acid) gave exactly the same spectrum, when dissolved in alcohol, or in highly diluted ammonia and alcohol, as belongs to chlorophyllan, and as the phyllocyanin has some slight solubility in dilute alkaline solution, Dr. Wollheim continued experiments with that substance. With a plate prepared by dissolving phyllocyanin in a solution of 2 cmm. ammonia, 20 cmm. alcohol, and 80 ccm. of water, and used either wet or in a moderately dry state, the photographic result was to obtain an image exactly corresponding with the visible spectrum of phyllocyanin; that is to say, that the absorption bands showed as bands of energy. With a thoroughly dried plate, as with one that had been immersed in an aqueous ammoniacal solution without alcohol, the spectrum came out corresponding to the visual

spectrum of phyllocyanin in aqueous ammonia. A similar result is obtained with zinc-oxide phyllocyanin, which gives either in alcoholic or alkaline solution, a spectrum identical with that of a freshly prepared tincture of chlorophyll.

In the article which follows Dr. Wollheim's, Dr. H. W. Vogel reaffirms his theory of optical sensitizers, which he considers to be powerfully supported by the results of the experiments with chlorophyll.

He remarks that shortly after the publication of his theory in the year 1873, when it was received with such general incredulity, Becquerel, in Paris, was the first to confirm it. According to the Vogel hypothesis, the absorption bands of a dye stuff correspond with the places of increased action of the spectrum on a plate tinted with the dye in question. Fuchsin has an absorption band in the green yellow of the spectrum. When a bromide of silver collodion plate is coloured with fuchsin, and the solar spectrum thrown upon it, powerful photographic action is shown in the place of the absorption band, that is to say, in the green-yellow. A similar observation had been made with regard to picrate green. This dye has an absorption band in the red. In the same place is found a powerful photographic action on a plate coloured with this dye. Corresponding results are obtained with naphthalin red, coralline, methylviolet, cyanine, &c.

Becquerel concluded from these facts, that if the Vogel hypothesis was the true one, chlorophyll, which shows a marked absorption spectrum with many bands, should act as optical sensitizer to a corresponding number of places in the spectrum. Thus chlorophyll was an important touchstone for the absorption principle. Becquerel's experiments confirmed this supposition. Chlorophyll gave several photographic maxima, corresponding with the absorption bands I, II, and III. Becquerel's discovery was some years later applied by the Brothers Ducos du Hauron, who for a long time employed chlorophyll collodion in their photo-chromatic process.

The Brothers Ducos du Hauron at first used chlorophyll alone, then chlorophyll in conjunction with eosine; finally they discontinued the use of chlorophyll, because at different times of the year it was found to possess such different characteristics, and because it decomposes so readily.

Ives took up chlorophyll about the time when the Brothers Ducos du Hauron discontinued it, and found the most suitable to be that obtained from the blue myrtle. He used it with collodion emulsion, and wrote a description of the process.

Eder employed chlorophyll with gelatine plates, and found that there was a slight though noticeable action. He employed ivy leaves extracted with alcohol, and poured the tincture thus obtained into water containing ammonia.

Ives has recently published a process with chlorophyll on gelatine plates, on which Vogel, in continuation of the article from which we have been quoting, points out that



there are serious objections to it in consequence of the extra deep orange yellow screen that is necessary, and of the fact that plates thus prepared do not keep. The chief objection to the use of chlorophyll, however, he considers to be the uncertainty of composition of the product itself. The alcoholic solution no longer contains chlorophyll, but chlorophyllan, together with vegetable acid wax, &c. When acted upon by alkali, phyllocyanin is formed.

Scientific researches upon these chlorophyll derivatives were much needed, and, thanks to Dr. Wollheim, are now in process of being made. The chief result, so far, of Dr. Wollheim's researches—which have been going on at the Royal Academy of Applied Science by the direction of the Minister, and have been carried on for half-a-year—is that phyllocyanin has the same characteristics as chlorophyll as an optical sensitiser. There is thus afforded the opportunity of obtaining such a sensitiser independent of the time of year and the particular kind of plant.

In laying before our readers Vogel's views as those of one of the earliest and most indefatigable workers in the field of orthochromatic photography by dye stuffs, we would remind them that somewhat different views are taken by other experimentalists, and that there is no immediate prospect of any reconciliation as to the theoretical aspect of the question. The practical value of the researches of the several experimentalists, however, does not depend upon the opinions they may form on the theoretical side of the case, and, indeed, differences of opinion and apparently conflicting statements may sometimes be resolved into a mere misunderstanding of words. In a recent controversy Vogel stated that plates could be prepared, and were prepared, which would give a decided effect of sensitizing to particular rays, commonly called orthochromatic, even when used without a coloured screen. Some photographs which he sent in confirmation of this statement certainly seemed to support it conclusively. Ives, on the other hand, in a letter in our issue of the 3rd inst., says that "no rapid gelatine dry plate ever produced will give correct colour values without the use of a colour screen." This statement is also, no doubt, perfectly true, and perhaps it might be added that no plate yet prepared, even in combination with any colour screen yet produced, will give strictly correct colour value. In the absence, however, of absolute exactness in the representation of coloured objects, we may be thankful for such approximations to exactness as the present state of photographic science can furnish, and use such approximate means, whilst striving for still more exactitude of result.

#### THE PHOTOGRAPHIC MOUNT BUSINESS.

An action of considerable importance was tried on Thursday last, in the City of London court, before the Deputy Judge (Mr. O. B. C. Harrison), which has a special bearing on the photographic mount trade; and in the course of which some evidence, and an interesting description was adduced. The proceedings were instituted at the instance of W. Herinann and Co., manufacturers of photographic mounts, who carry on business in Berlin as well as at Great Winchester Street, London, and the statement of claim demanded payment of £16 3s. 6d. for 10,000 mounts supplied to the defendants, Gun and Stuart, photographers, of Richmond. The fact that the goods were supplied was not in dispute. The objection raised by the defendants was that the cards split when used, and they were therefore not only useless, but had done injury to their business, as they had lost custom by it, as well as had to replace others.

Mr. Johnstone Watson, the counsel for the plaintiffs, called evidence to disprove the suggestion that their mounts were of an inferior description. Mr. Gyselynek, the plaintiffs' representative in London, spoke to an interview with one of the defendants when the mounts were ordered. He told the defendants their cards would not split, and in spite of the production in Court of some of the cards he had supplied which were split, he declared that theirs were the best in the trade. He would hear of no inferiority in his cards, and was indignant at the

inuendo made by Mr. Leslie Probyn, the counsel for the defendants, in cross-examination. The cards sold to the defendants, he exclaimed, were the same sort as they had made ever since 1848. They only had one class of goods, and were the largest manufacturers in business. They supplied the first firms in London, Berlin, and elsewhere, and held valuable testimonials. In the course of conversation with one of the defendants when the order was given, reference was made to Marion, one of the plaintiffs' rivals in business, and when the defendants said the cards they had had from Marion's had split, the plaintiffs' agent said, if they would give him an order, they would find his did not split. Of course he would not say that a few would not split—that was quite possible; but the principal allegation he made was that if, as he was informed, 500 out of the number supplied had split, it was caused through the defendants' own fault in adjusting the pictures to the mounts. This naturally raised the whole question as to how photographs should be mounted, and the process through which they should go, which is referred to further on. The plaintiffs' London agent underwent a rather stringent cross-examination at the hands of Mr. Probyn. Some of the photograph mounts complained of were handed to the bench, but his Honour in several instances said there was nothing objectionable about them, while with others he observed there were creases and wrinkles upon them.

It was urged, on the one side, this was undeniable evidence that the mounts were improperly made, while the other side held it was conclusive proof of the general incompetency of the person who pasted on the photographs. This allegation was met by the defendants by saying the operator was a man with several years' experience, and knew his business too well to leave wrinkles in the pictures. An idea was thrown out by the Deputy-Judge that if the cards had been subjected to too much heat in a window or anything of the sort it would break the mount; but that fell to the ground instantly, as the defendant's counsel said they broke very soon after they had been used. The Deputy-Judge, who is not of the most retiring nature, attempted to soothe the savage breast of the defendants by telling them that 500 split mounts out of 10,000 was not many. But again the observation fell flat. His Honour was told that 3,000 had been used by the defendants, but they were afraid to use any more for fear they cracked or split. But he thought that excuse was not worthy of consideration. Mr. Probyn, amid some laughter, put it to the Deputy-Judge that were he to have his photograph taken by the defendants the next time he goes to Richmond, he would not like it to split down the sides, and the President of the Court replied that no doubt they could supply him out of the 6,000 which were still on hand.

In substantiation of the case for the defendants, that the operation of sticking down the photos on the mounts was done properly and in a business-like and skilful manner, it was shown that Gunn had been in business for over twenty years, and had therefore had a great deal of experience. The defendants turn out about 1,000 mounts a week, and 3,000 had been used before the defect was thoroughly established. As a matter of fact, they were considerable losers by the transaction, and might have brought a substantial counter claim in respect of the alleged loss of business by reason of the bad quality of the cards. Mr. Stuart gave his version of what took place at the interview. It was only upon receiving the plaintiffs' agent's guarantee that the cards would not split he gave the order. After they discovered they were split, it was necessary that they went on using them, as they had no others. The Deputy-Judge at first regarded that as absurd, though upon being told that the cards had the defendants' name, address, &c., printed on the back and front, and that they could not send out photos without a name upon them, the statement had some weight in his mind. By way of accounting for the cards cracking and splitting, his Honour suggested whether too much moisture had not been used in mounting the photographs; but this was denied. An attempt was made on more than one occasion by the Deputy-Judge to give his judgment, as he said he had made up his mind; but Mr. Probyn insisted upon calling further evidence, and going more fully into the details of the case. Mr. Stuart said, in several instances he had supplied a dozen photos, and five of them had split. This necessitated him reprinting pictures to replace them, and the cards were useless. The process through which the mounts go in adjusting the photographs was then described.

Mr. Stuart said the photos were brought up out of a bath, and then starched and put on the mount. They were always dried before they were put on; at any rate, they ought to be, and he believed they were. The photograph, mounted, was



then laid on a bench in a large room to dry. It was customary to put them between sheets of blotting-paper to exclude the damp, and this custom was observed in their establishment. They also "rubbed them down." A photograph was produced which was wrinkled, and which, the witness said, was caused through the card being made of inferior material, but which, the plaintiffs said, was brought about by extreme damp in mounting. A somewhat amusing incident occurred when it was suggested in cross-examination that the moulder had been discharged because of his inability to do the work properly. The defendants said their moulder happened to be a lady, and the reason for her leaving was that she had been married. After drying the photographs they were burnished, but the splitting was not brought about by that operation. A long discussion took place as to whether in law there had been acceptance of the goods, and several attempts to settle the matter amicably were made in vain by the Deputy-Judge, who finally found a verdict for the plaintiffs for the amount claimed. It was intimated that after this decision the defendants had no other course open to them than to bring an action against the plaintiffs for damages for breach of contract.

#### JAPANESE PAPER FOR POLISHING GLASS.

THE thin, soft blotting-paper sold in France under the name of "Papier Josef" is pretty extensively used by

Continental photographers—and, to some extent by English workers—for polishing or cleaning glass instead of cloth; but there is now in the market a quantity of Japanese paper which is very much to be preferred to the "Papier Josef" for cleaning and polishing purposes. The paper in question forms a very thin felted network of long and tough fibres, and, as far as our experience goes, it is quite free from any gritty particles. This paper has much of the physical character of soft cloth, &c., but is far more efficient in removing deposits from glass, perhaps because the fibres stand apart and act as individual scrapers.

We think that those who once try this paper for polishing plates or wiping their photographic lenses will discard wash-leather or cloths. At present the paper in question is not kept in stock by ordinary stationers, but the wholesale agents are Berwick Bros., of Ropemaker Street, City, and the paper is sold as "Dental Japanese Paper." A packet of 1,000 sheets, 9 by 18 inches, costs between seven and eight shillings.

#### THE YELLOW SCREEN IN ORTHOCHROMATIC PHOTOGRAPHY.

THE illustrations referred to in the letter of Vero C. Driffield, which appeared last week, are now reproduced.



With regard to this matter Mr. Driffield says:—"The plates I used were procured from one of our oldest and best known makers. I first tried them for ordinary landscape work, and as I could find no advantage in them for this purpose, I arranged the group of objects of which I send you two prints, one taken from an ordinary, and the other from an orthochromatic plate. I have numbered them 1 and 2, and shall be glad to hear if you can decide which is which. The objects in the group were carefully selected as regards colours. The design on the china plate is in yellow and blue grey; the flowers were red, blue, white, and yellow; and the books black, red, blue, green, and brown. I cannot speak with respect to the plates of other makers, but so far I am disposed to think that an orthochromatic result can only be obtained by means of a yellow screen, and that, with this adjunct, any sensitive plate will yield orthochromatic results."

#### REYNOLDS AND BRANSON'S "LEEDS" SHUTTER.

FROM Reynolds and Branson, of Commercial Street, Leeds, we have received for review an ebonite flap and drop shutter of their latest form, embodying the result of their extensive experience in making this sort of shutter. Indeed, we believe the firm in question was the first to introduce this form of shutter to the public, and the numerous modifications which they have introduced have been the result of their experience.

The present form is not quite so complex as that which we last noticed, but we think it is more efficient, and moreover the price is lower.

One excellent point is that the distance strips which separate the runners from the base, are of brass, thus giving more rigidity than when the whole was constructed of ebonite. Variable speed can be obtained by



altering the tension of the elastic band ; the catch for preventing rebound is simple and efficient ; and if it is desired to use the instrument as a simple flap shutter, the drop can be clamped by a screw passing through one of the brass side strips. The release is pneumatic (Spink's loose piston system), and the work is all through of the same excellence as that of the previous shutters by Reynolds and Branson that we have noticed.

### THE IMPERIAL INSTITUTE FOR PHOTOGRAPHIC RESEARCHES IN VIENNA.

The summer session of this recently established Institute closed on the 15th of July last, and the attendance of pupils was excellent. The first course of instruction was attended by 71 pupils, while in the case of the second practical course, which includes retouching and the various photo-mechanical processes, the entries were 37. The ages of the students ranged from 15 to 47, and of these a considerable majority consisted of adults. Many were engaged in trade work, such as photography, lithography, and engraving. Of these, some merely attended the drawing classes of the Institute, while others merely entered for the instruction as to negative and positive retouching.

Two pupils of the Institute undertook photographic tours of research, after the work of the session was over, one of them going to Asia Minor, and another to the Canary Islands.

During the summer session, papers were read on photographic chemistry, physics, and printing methods, and series of practical demonstrations were given in the laboratory by some of the students. The series of demonstrations on the study of chemical products included practical work in connection with solution, crystallization, filtration, quantitative analysis, and testing of chemicals ; while the series of demonstrations in photography included the wet collodion process, the gelatino-bromide negative process, orthochromatic photography, copying, reproduction of plans, enlarging, photo-micrography, photo-mechanical methods, and zincotype.

The Institute is under the direction of Dr. Eder, who has six departmental teachers working under him.

### LAW FOR PHOTOGRAPHERS.

BY S. J. DEBENHAM, SOLICITOR.

#### CHAPTER IX.—ENFORCEMENT OF CLAIMS.

##### *Debtor and Creditor.*

I PRESUME that the majority of photographic work is paid for at the time it is done—in other words, it is a cash business. But photographers, like other persons in business, are obliged to give credit very largely, and, in fact, very much of the work is not susceptible of any other treatment.

I will, therefore, consider the principal objections that can be made by a customer, or sitter, to payment when claimed, *i.e.*, the defences generally raised to actions. These remarks will be equally useful to the reader as a debtor or defendant.

The first is, non-performance of the contract by the creditor. Not very much need be said about this, as it is clear an agreement or contract must be performed to entitle the creditor to payment. A person is equally chargeable with a breach of contract, whether he directly refuses to perform it, or voluntarily does an act which puts it out of his power to do so, or which prevents the other party from having the benefit of it.

Where a contract is to do a thing in one of two ways, and one is found impracticable, the other mode must be adopted. The choice is left to the party giving the undertaking.

Where the contract does not name any time for performance, the law requires performance in a reasonable time, without reference to extraordinary circumstances.

If a month be named, the general presumption of law is that a lunar month, and not a calendar month, is intended. But if the context implies the contrary, or the surrounding circumstances or the custom of a trade or locality render this improbable, a calendar month may be preferred.

This does not refer to bills, promissory notes, or other mercantile instruments.

If, before the time expires, a party renounces or repudiates the agreement, an action may be maintained for breach notwithstanding.

Cases like the following frequently occur (names are assumed).

Jones agreed to supply Williams with straw, to be delivered at his premises at the rate of three loads a fortnight, during a specified time. Williams agreed to pay for each load delivered during that time ; but, after some of the straw had been delivered, he refused to pay for the last load, and insisted on always keeping one payment in arrear. Jones refused to supply any more, and it was held that he was justified in so doing on the ground of the refusal to pay.

If there be only a partial failure of performance by one party to a contract, for which there may be a compensation in damages to the other, the contract itself is not put an end to. The right to abandon a contract belongs only to him who is not in default ; but such right, when it exists, must be asserted and exercised within a reasonable time. And a contract cannot, in general, be repudiated and put an end to altogether by either of the parties where both of them cannot be placed in the situation they were in at the time it was made. Where one party has derived some advantage from the partial performance of the contract, the general rule is that the agreement shall stand and the contract be performed, but the party aggrieved may claim damages.

2. Payment is of course a defence, and the reader may wonder what I am going to say about it. I wish to show what is and what is not payment. Payment to an agent binds the principal, and is a discharge as against him, provided it be made in the ordinary course of business, and before the principal has demanded the money himself.

Where the defendant had paid an account in the plaintiff's counting-house to a person who was sitting there, within a railed off partition, having account books near him, and apparently engaged in the business, though in reality he had no authority to receive the money, it was held good payment to the plaintiff. But payment to an agent will not bind the principal unless it be made in the usual course of business. If a shopman, who is authorised to receive money over the counter only, receive money out of doors, such payment is not a good discharge. Nor can an agent bind his principal by taking payment otherwise than in cash, as by a bill of exchange, unless it is customary (which it certainly is not in photographic business) to settle in this way.

As a traveller who receives orders for goods from his employer's customers is generally authorised to take payment, such payment is a good discharge, but only by cash or cheque (as above observed).

Payment to a wife is no payment to the husband, unless it be shown that she had authority to receive the money.

Payment to one of several executors is sufficient, and to an administrator having the grant, even though a will should be afterwards discovered. (Where a man dies leaving a will he appoints an executor ; where he dies intestate this office is filled by an administrator, generally one of the next of kin.)

Payment of a debt to one of two trustees is a payment to both.

A defendant having ordered goods for ready money, paid for them by sending to the vendor's agent a dishonoured acceptance of the vendor. The agent at first declined to receive it, but afterwards took it to the vendor, who kept it. It was held to be equivalent to payment.



If money be sent by post in a letter properly directed to the creditors, and be lost, the debtor is discharged if he were either directed to send it, or if that was the usual course between the parties.

If a creditor have two separate claims against a debtor, and the latter pays money generally on account, the creditor may appropriate the payment to either claim as may be most to his advantage; e.g., if part of the claim was for goods supplied to the wife (as to which there might be a doubt of liability), or for a debt barred by the Statute of Limitations, which I shall mention presently.

If, however, the debtor himself appropriates the payment to a particular claim, the rule does not apply, but the amount must be allotted accordingly. And it is not necessary that there should have been an express declaration by the debtor at the time of payment, as to the amount to which he intended such payment to be applied. This may be proved either by the previous or the subsequent directions of the debtor.

And it may even be collected from other circumstances, that the debtor intended at the time of the payment to appropriate it to a specific account.

### PICTURES BY THE ACTION OF COLD.

BY D. WINSTANLEY.

ON page 11 of Mr. Jerome Harrison's interesting and excellent "History of Photography," it is stated that "a Chinese tradition credits the sun with sometimes producing pictures of the neighbouring objects upon the ice-covered surfaces of lakes and rivers." "A similar idea," says Mr. Harrison, "must have possessed the mind of Fénelon when, in 1690, he wrote his fable called 'Une Voyage Supposé,' descriptive of the imaginary journeys of an imaginary personage, in which the following passage occurs:—'There was no painter in that country, but if anybody wished to have the portrait of a friend, of a picture, a beautiful landscape, or any other object, water was placed in great basins of gold or silver, and the object desired to be painted was placed in front of that water. After a while the water froze, and became a glass mirror, on which an ineffaceable image remained.'"

I have never before, I think, met with an account of the beautiful and poetical Chinese tradition alluded to by Mr. Harrison, a tradition to which, I apprehend, he attaches no importance. I have myself, however, a great veneration for the "traditions" of the celestial race, as they so frequently turn out to be "traditions" which are true. I will give one instance only. "The Chinese have a tradition" said a comparatively "modern astronomer," "that comets sometimes break in two. What nonsense! They might just as well have a tradition that two comets sometimes join together and form one." Since the modern astronomer in question wrote these words, however, or very similar words to exactly this effect, the phenomenon of a comet breaking in two has actually been observed, not by one astronomer, but by scores. The comet discovered in the year of my birth, in 1846, by Biela, a comet of "short period" which took about seven years to perform its revolution, did as a matter of fact, during one of its subsequent apparitions exhibit the phenomenon of bipartition. It first projected a "knob" on one side of its nucleus. The "knob" then removed itself some distance from the nucleus, to which it remained attached by a "luminous string," and projected a tail upon its own account. The "luminous string" then disappeared, and the new comet careered along its course as a "companion" to its progenitor. The distance which separated them continued to increase, as did the visible magnitude of the body newly formed, until, from a dimensional point of view, the "companion" became the principal comet, and its progenitor the "companion." Biela's comet as such has now entirely disappeared from the attendants of our sun, and given rise by its indefinitely-

extensive subdivision to a cloud of meteors moving along its path. The same fate has occurred to Tempel's comet, and the same is probably the ultimate fate of all comets. They appear to come from entirely extraneous space, to be in the first instance utter strangers to our system, to be captured by the attractive influence chiefly the "giant planets," to then circulate around our sun, to be diminished by the evaporation caused by his fervid heat, and eventually to be entirely dissipated, and in their aphelia to condense into the meteor streams we know as the "food" of the planets and the sun. Anyway, this particular "Chinese tradition" has been demonstrated to be true, and so have several others which I could name. For this reason I should therefore be inclined, apart from any special evidence, to regard with considerable respect that particular tradition which "credits the sun with sometimes producing pictures of the neighbouring objects upon the ice-covered surfaces of lakes and rivers."

Particular evidence, however, is not wanting. In the columns of this journal, nearly twenty years ago, on the 18th of December, 1868, in an article written by myself, and most certainly in ignorance of the Chinese or any other "tradition" of a similar kind, an account is given of the production of pictures in ice by natural means.

The following are quotations from the article in question:—

"The production of pictures by the influence of electricity, electrotypes, and the telegraphically transmitted autographs of Mr. Bakewell for instance, are familiar to readers of works on natural science; but the production of pictures through the influence of heat, or, as the writer has more incorrectly worded it above, the action of cold, is a possibility by no means so generally known."

"Between the months of November, 1863, and March, 1864, it was the writer's fortune to winter in Wisconsin, U.S. The weather was exceedingly severe, the thermometer falling frequently to as much as 38° below zero (Fahrenheit). Cold like this, especially when accompanied by a strong wind, tries human powers of endurance to a much greater extent than they ever are, or perhaps than they ever have been, tried in England. During the winter alluded to, Lake Michigan was frozen as far as the eye could reach, and when the ice broke up in the harbour of Milwaukee it was twenty-six inches in thickness. The snow in the districts round about the town was fourteen feet in depth, and on New Year's Day, 1864, eleven persons were frozen to death within the city limits."

"At the commencement of these 'cold spells,' as these periods of intense cold are termed, the thermometer frequently falls more than 50° in a single night. In these circumstances all the moisture floating about in the atmosphere of a room is congealed in the form of a thick coating of ice upon the windows, which ice is crystallized in a more or less opalescent form, according to the rapidity of the condensation."

"One morning, upon entering the drawing room of the house where he resided, the writer's attention was arrested by the beautiful and regular design given in different degrees of opacity by the ice upon the windows. These windows descended quite to the floor of the room, opening on to a veranda on the outside. The design alluded to upon the frosted glass was vague and indistinct at an elevation of 15 inches from the floor, but became more sharp as it descended, until quite at the bottom the leaves and flowers of the carpet were distinctly and unmistakably traced upon the glass. The writer called the attention of several others to this interesting phenomenon, which all were able to see without difficulty was, as the writer has stated, a representation of the design upon the carpet."

"The different degrees of facility with which radiation was possible from the various colours forming the design of the carpet affords, no doubt, the true explanation to be given the production of the design upon the window."

My article of twenty years ago then proceeds to describe an experiment by means of which I endeavoured to re-



peat the production of "pictures by the action of cold" on the laboratory table. As the experiment did not succeed, it is needless to repeat its details. The method I adopted was the subject of kindly criticism by one Dr. Anthony, of Birmingham, in a letter printed in the following number of the PHOTOGRAPHIC NEWS (December 24th, 1868). That gentleman concluded his letter with the words: "I trust that Mr. Winstanley will see that I am not attempting to dogmatise, but only offering suggestions; and that if that gentleman should succeed in a future trial, to him will belong all the credit of a philosophical and a beautiful experiment."

With only a year or two to live, I don't know that it matters much to me to whom the credit of anything may belong; but in a future edition of his work, which I commend to the perusal of all photographers, I think Mr. Harrison may lay it down as a fact that pictures are produced naturally by the operation of cold, and that the Chinese "tradition" he mentions in all probability is true.

It is curious that Fénélon, in his "Voyage Supposé," should have spoken of basins of gold and silver—the very metals which have thus far played so prominent a part in the operations of photography.

I don't know that the production of pictures by the "action of cold" would be a matter of much importance, even if reduced to a practicable process, and I don't know that it would not. The thermal opacity of glass would probably render glass lenses of very little use for the production of thermal pictures, whilst pinhole "thermography," or "frigerography," would very likely be practicable enough for taking pictures after darkness had set in, and therefore be very useful for military purposes, when once a working process had been discovered. I do not think that any really great difficulty should be experienced in the discovery of such a process. It is merely a problem in physics requiring, so far as I can see, no very profound amount of knowledge, and no very superlative inventive skill.

Under the clear canopy of a nocturnal sky terrestrial objects radiate their thermal energy into the depths of space, and on to other bodies colder than themselves. If I expose a pinhole camera to a landscape subject (or, for that matter, to any other), and my plate is colder than the picture (visible or invisible) projected on it through the aperture, it is certain that that picture is not merely a mathematical conceivability like the celestial equator, but it is a physical fact, and the temperature of my plate varies in its parts with the radiating power of the objects to which it is exposed. It contains upon its surface as true a thermal picture, even in the night, as the ground glass of a common camera contains an actinic picture in the light of day, and a picture assuredly as capable of development. We have chemical substances—solid or liquid—capable of volatilization at any ordinary temperature we like to name, and capable of condensation within such ordinary limits as we think proper to prescribe.

Experiment is required to enable us to determine which of these chemical substances will condense in sufficient quantity to form a material picture upon our thermal one, and this material picture being formed, any chemist knowing its composition will, without a moment's hesitation, name the developer required to make it visible and permanent. In short, "frigerography" is not only an actual natural phenomenon, but it is one which in its essence is capable of artificial reproduction in the camera.

## CHAPTERS IN ELEMENTARY PHOTOGRAPHY— A GUIDE TO BEGINNERS.

BY W. M. ASHMAN.

SIXTH ARTICLE.

In the opening chapter of this series of articles it will, doubtless, be remembered that reference to the pinhole form of camera without the aid of a lens was made. Such

representations of objects as are in this manner obtained not only interest and instruct, but they embrace a much wider angle of view than can be got by the use of any wide angle lens met with in commerce. This characteristic renders pinhole photography, as it is sometimes called, practical for architectural subjects located in very narrow streets and other confined situations. But the general practice of photography could not be pursued without the employment of a suitable series of lenses possessing special features designed to meet the requirements of photographers.

Text-books on light teach us that ordinary white light is really a combination of coloured rays, and if we analyse a beam of sunlight or electric light by causing it to pass through a prism of glass, seven principal colours may be distinguished, namely, red, orange, yellow, green, blue,

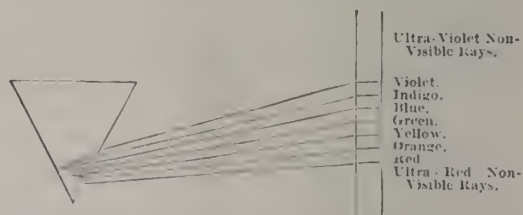


Fig. 12.

indigo, and violet.\* This is termed refraction of light. Fig. 12 is intended to represent a ray of light entering a prism at a point. It is strongly refracted at the surface of the medium, and, on emerging from the opposite side, the course is continued in a straight line. To prove these prismatic colours will recombine to produce white light, the colours mentioned in the above-named order may be painted upon the face of a wheel, and when rotated rapidly will be found to yield an approximately white surface. Prismatic colours may often be noticed, as in the rainbow, and when a beam of light passes through cut-glass ornaments, lustres, the margins of a bi-convex lens, &c., where the surfaces are at an acute angle. The fringe of colour surrounding a visual image produced by means of a bi-convex lens is known as *chromatic aberration*, and from a similar cause—viz, the splitting up of white light—we get with a non-corrected lens a *chemical focus* and a *visual focus*, which do not coincide. Lenses of modern manufacture are corrected for both chemical and visual foci; but a good many old instruments which are apt to fall into the hands of beginners will not yield a sharp negative, however much care has been taken in focussing, unless the distance of the lens from the focussing screen be afterwards increased; the precise distance being a matter of experiment.

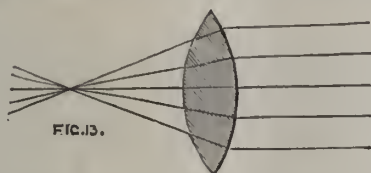
In examining the spectrum produced by splitting up white light, it will be seen that yellow is the most luminous of the colours, but its photographic action is almost nil. Red rays are principally heat rays, which can be demonstrated by placing a thermometer in that portion of the solar spectrum. Photographic action mainly depends upon the indigo, violet, and blue rays, which are known as actinic rays. Thus in the middle of the day the proportion of these actinic rays being greater than at early morning, or near sunset, photographic action upon ordinary sensitive surfaces is proportionately increased, and the length of exposure must be regulated accordingly. White light is decomposed by reflection from coloured surfaces, and by transmission through coloured media. Thus, white light impinging upon a whitewashed wall is reflected as white light, but white light impinging upon a red brick building is in great part absorbed; only a portion of the red rays

\* The spectroscope is a useful instrument for testing any kind of light, and full details of the method of using it will be found in G. Ray Wood's book, "The Spectroscope, and its Relation to Photography."



will be reflected, and these determine the colour of the building or other surface. Again, transparent glass permits all rays of light to pass through, cobalt glass permits the passage of blue rays and stops nearly all the others. Oxides of gold and copper, when melted with silica flux, produce a ruby-stained glass, which stops the passage of all rays except red, and thus provides a non-actinic medium through which we are enabled to obtain a tolerably safe illumination for the dark room. This will be treated more fully in another chapter. A ray of white light travels through a transparent medium in a straight line, but on entering another medium of greater or less density is refracted in all cases where it reaches the surface at an angle of incidence. Advantage is taken of this optical law in the construction of photographic lenses, and glasses ground in a curved form are called lenses.

In fig. 13 we have a lens with two convex surfaces; the



lines indicate the course a ray of light would be refracted, so that a lens of this description tends to condense light to a point. All rays of light reflected from an object situated at a distance from the lens are likewise brought to a focus at some point, and an inverted luminous image of the object thus formed can be seen by the aid of a darkened room or a camera.

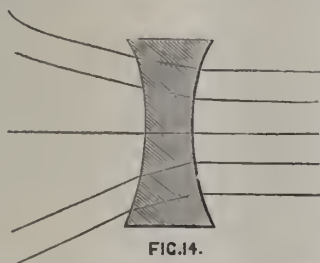
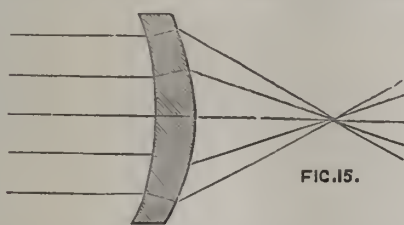


Fig. 14 shows the scattering power of a bi-concave lens. Fig. 15 indicates both actions combined. The point at

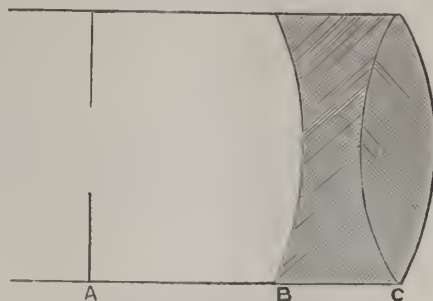


which the rays of light cross each other is the focus of a lens. Parallel rays come to a focus nearer the lens than divergent rays, and are called the principal focus or focal length of a lens. Central rays and those from long distances are parallel, whereas those emanating from near objects are divergent. These latter are connected with the focus, and the two are then called the conjugate foci. It is objects near the lens which require care in adjusting the focus, the distance required between any given lens and the focussing screen being greater than that needed for distant objects.

There are three distinct types of lenses manufactured for the use of photographers, each being better adapted for one purpose than another. These are the single landscape, the doublet, and the triplet combinations, which may again be subdivided into wide and

narrow angle, long and short focus, ordinary rapid, extra rapid, &c.

The instrument termed a single landscape lens usually consists of two glasses having curved surfaces cemented together in one cell to form a single combination, as illustrated in fig. 16. B, the meniscus lens, is made of crown



glass, and C, the bi-convex, of flint. A is the position of the diaphragm plate, through which light is permitted to enter and illuminate the concave surface of B, passing thence by way of C to form an image at some distance beyond. The best position for the diaphragms or stops in a single lens is in front of the combination, about one-fifth the distance of the focus of the lens. Thus, a lens of 10-inch focus would require the stop to be 2 inches in advance of the combination. Lenses of the class we are considering cannot be worked satisfactorily without a moderately small stop, and it should be borne in mind that the more distant objects to be photographed are separated from each other, the smaller must be the aperture employed. We have just seen wherein lies the distinction between principal focus and conjugate focus. If, then, the aperture of a single lens be diminished by placing a stop in front of it, we practically admit only parallel rays, which tends to secure a well-defined image. Dallmeyer has recently improved upon this form of lens, and some advances have also been made by Voightlander, which will be dealt with further on. These improved lenses are said to be non-distorting; should this be the case, the principal objection to this class of lens—viz., distortion of lines in near objects—will be removed.

A word regarding manufacture of lenses. They are cut from blocks of optical glass, free from striae and other imperfections, and of sufficient dimensions to permit loss by grinding to the requisite curves. The surfaces are carefully ground with curved tools and cutting mediums, such as flour emery, until they assume the proper shape. Then these curved surfaces are subjected to further treatment in order to secure a high degree of polish. Edging, and centring, two important operations, are effected by revolving the lens in a lathe, and watching the reflection of a gas flame thrown from the surface. When the image of the flame has been made to appear stationary, then the lens is regarded as having been properly centred. The components of the combination are next cemented together with Canada balsam to obviate the loss which would otherwise occur by reflection from the two inner surfaces. They are then ready for fixing in cells and rigid metal mounts. The precise curvature of a lens opticians determine mathematically from the refractive and dispersive ratios of the glass employed. Focal distance of any lens depends mainly upon these curves. Refractive power and the thickness of the glass have also to be considered. Fortunately for photographers, they are not required to perform this task. Their business is to make an intelligent use of the instruments prepared for them, but without some technical acquaintance with the subject this would not be an easy matter. Qualities of different lenses and details of manufacture, if fully described here, would extend over many



chapters, and must necessarily be a repetition of some of the matter which has appeared in these pages in a more comprehensive form. Therefore the writer will confine his remarks to a description of the leading forms of lenses in general use, and the special adaptability of each for certain kinds of work, now that an outline of the formation of a lens has been put forth.

### Notes.

The Vienna Photographic Exhibition is to be opened by Her Imperial Highness the Archduchess Maria Theresé. Those who have not yet sent their exhibits may still be in time, if they forward them immediately to Schenker and Co., 64, Moorgate Street, London.

Photography might well take a place in the work of the office for the registration of newspapers, and indeed in numerous other Government departments, for the rapid and exact reproduction of such documents as the ordinary copyist is hardly able to manage.

Not long ago we were in the Newspaper Registry at Somerset House, when the proprietor of a London newspaper which is printed in the Hebrew character (Yiddish language) filled up the registration form and presented it to the clerk in charge. A good clerk never likes to be taken by surprise, so he affected to read the strange-looking script, but rather betrayed himself by passing his eyes along the line backwards. He, however, took the document to the head of the department, and after a consultation he returned and suggested that it might be as well if an English equivalent were given, as otherwise the copying of the title into the registration books might be difficult. Now, in a case of this sort, the title might easily be photographed, and the photograph stuck in the Register.

Photo-chemical knowledge might also do good service as regards another point in the Newspaper Registry. The receipt for the registration fees is dated with an india-rubber stamp charged with fugitive aniline ink; if left in a bright light, all trace disappears. The department might adopt a suggestion we made some time ago, and put nitrate of silver in the ink used for stamping with rubber stamps. Equal parts of a saturated solution of nitrate of silver and of glycerine makes an ink for rubber stamps which is invisible at first, but which soon becomes visible on exposure to light; and this same ink, mixed with a little of the aniline ink, makes a preparation which is not only visible when first used, but becomes darker on exposure to light.

The House of Lords has given its consent for the Manuscript Prayer Book originally attached to the Act of Uniformity to be photographed. The condition imposed is that one *facsimile* only, and that one of the same size as the original book, be taken. As regards the process of photography, all the expense of which will be defrayed by the two Universities and the Queen's printer, the librarian of the House will have the custody of the book. The book will be locked up every night, and the librarian

will be authorised to stop the work if the book shows signs of being in any way injured.

Amateur photographers who expect to find something photographically instructive or entertaining in an article in this month's *Art Journal*, entitled "With the Camera from Lechdale to Oxford," will be wofully disappointed. The article is illustrated with orthodox wood blocks which have no relation whatever to the camera, much less to any photographs supposed to have been taken by the author of the paper. The title is altogether misleading, and the article might just as well have been called "With a Boathook from Lechdale to Oxford," or "With a Pair of Canvas Shoes from Lechdale to Oxford."

It is curious that most amateurs who take their cameras with them on pleasure trips have so little to say that is photographically interesting. To say that one came across a picturesque view, and that the camera was planted, and a picture was taken, is to utter the veriest platitude. The guide book style of description is of all styles the baldest, yet writers of so-called photographic trips seldom get beyond it.

A contemporary has raised the question: Has a man an interest in what may be called the copyright of his own voice? The point arises out of the reproduction of speeches and of singing by means of the phonograph. Some day the point may occupy the attention of the law. In the meantime a somewhat similar question is of interest to photographers: Has a man a copyright in his own face? Say, for instance, a photographer taking a street scene, who takes the portrait of a man who decidedly objects to his visage being exhibited: has the man any remedy against the photographer?

An artist, who draws a good many portraits from life for an illustrated paper, told us the other day that he was a good deal exercised in his mind over this matter. His sketches are frequently made without the knowledge of the persons sketched, and though he has not yet got into difficulties, he fully expects some day that difficulties will arise. We could only console him by remarking that if his portraits were not flattering, the originals might commence an action for libel. But as a libel in such a case must be decided by the friends of the person alleged to be libelled, the artist has a very good chance of escaping.

It is time that some strong representations were made to the Custom House authority in regard to the inspection of sensitive plates by their officers. An amateur photographer details in the *Times* this week his grievance, which seems to be of a particularly aggravating character. He arrived last week at Gravesend in the steam yacht *Ceylon*, bringing with him several dozen plates, the result of a trip to Norway and the North Cape. Notwithstanding entreaty and expostulation, the Custom House Officer insisted not only on having the box opened, but also on tearing open the paper covers. The result of course was a total loss of the negatives. The writer endorses the



suggestion we have made over and over again, that negatives should be inspected in a dark room, and handed over to the owner on payment of some small fee to cover expenses. Some plan of this kind ought to be adopted. To leave the matter to the discretion of the officer would be quite useless. A few of these officials have common sense, but the majority are imbued with one idea; namely, that the whole world is bent upon smuggling tobacco and spirits. Remonstrance to a wooden-headed personage of this description is of course a waste of time.

Really, if the Bulgarian Government do not soon manage to put down the very active and so far successful bands of brigands which infest their principality, they will have to at least draw up, for the information of the travelling public, an official tariff stating in detail the prices which various members of society will be expected to pay for their lives should they unluckily fall into the hands of the picturesque but decidedly practical banditti in question. Of course the prices in this tariff will have to be settled after due discussions with the brigand chiefs themselves, which would be rather an undignified course for the Bulgarian Government to take, we admit; but, on the other hand, however, it is simply intolerable that the present state of uncertainty as to their current value in specie (from a brigand's point of view) should be allowed to vex the souls of the tourists and others whose business leads them to undertake travel in Bulgarian territory. For example, it is only a few days ago that the news of the liberation of an Austrian station master and a Hungarian merchant was followed by a telegram announcing that a sum of £5,000 had been demanded as the ransom of an unfortunate photographer who had also fallen into the brigands' hands whilst in the performance of his duties. From this despatch it would seem that for some reason or another the brigands of Bulgaria appraise professional photographers at a very high rate. Photographers as a body, indeed, cannot but feel flattered that one of their brethren should be deemed worth more than twice as much as a station master, and half as much again even as a merchant prince. But whatever photographers generally may feel, that particular photographer, who is now probably tied up in some damp Bulgarian cave, and living on half-cooked goats'-flesh, is likely to feel anything but flattered at the high price set on him by his captors, who probably have fixed his ransom at such an excessive figure to cover the risk they imagine they run from the fact that their prisoner may, in spite of them, succeed, if ransomed, in carrying back to civilisation some evidence of his captors' identity.

There is the more need for the immediate fixing of the tariff we allude to, seeing that the chances are now-a-days that at least fifty per cent. of the tourists who visit Bulgaria are amateur photographers. These amateurs, then, will naturally be anxious to know if they, too, are to be valued at £5,000 a piece. Because, if they are, they will probably avoid Bulgarian territory altogether, or if they visit it, will take care to leave their cameras and dry plates at the frontier. Professional curiosity has

also been aroused, and we must confess that we should be much interested to learn the current value in the Bulgarian brigand market of (say) an R.A., or a F.R.B.A., as compared with one of our own craft. Other problems suggest themselves for solution, too. For example, we should like to know, granted that a station master is only worth half as much (to a brigand) as a professional photographer, what the exact value of a civil engineer is with artistic taste? Or again, if a merchant prince and a photographer are worth £7,500, what is the combined value in Turkish pounds of a professor of mathematics and a low comedian out for a holiday? But the temptation to make these comparisons must be resisted, though meanwhile, as we have said, we have, we think, a special right, under the circumstances, to insist on the immediate tabulation of such a tariff as we have demanded.

#### PHOTOGRAPHY AS A FINE ART.

BY ENOCH ROOT.\*

Do photographers, as a class, realize what a wonderful and beautiful profession they are engaged in—what capabilities, progress, and possibilities are found in this most fascinating art-science? Where is there its equal in the whole range of earthly pursuit? Comparatively of recent birth, not a year passes that some new and astounding discovery of its use is not promulgated; and this is not confined merely to pictorial representation, but running through the whole range of the arts and sciences. Where will its advancing steps be arrested? None can tell; but we may confidently look forward to continued progression into new fields of usefulness and beauty yet unexplored.

But the crowning glory of its future, whatever else may follow, the one element that is to give grandeur and dignity to its pursuit, are concealed in its art possibilities. It therefore behoves the craft, in devoting all due attention to its technique, not to neglect so essential a feature of their progress as the æsthetic. It is only by this means that the true position of photography as a fine art can be claimed and maintained. That so many persons are disposed to deny the attribute of art to photography is chiefly owing to the apathy and insensibility in this respect that exists among such a great number of the artisans of the profession, who pay scarcely any heed to its purely artistic expression.

Mere manipulative skill in producing highly-finished work is not art, although a most desirable and praiseworthy requisite in obtaining the favour of the general public. But that public is becoming day by day more cognizant of other desirable qualities, and the time is not far distant when fine polish and excessive characterless retouching will no longer serve to conceal awkward posing, bad lighting, and inartistic arrangement.

Who among our photographers are alive to this awakening? Of the hundreds who yearly leave their business to attend these conventions, or, obliged to remain at home, take an interest in the proceedings through the various reports, there is much to hope from; they are at least in the line of learning the needs of the present, and can foretell those of the future. But how about the other large army of fellow-workmen who exhibit no interest in this society devoted to their advancement, and, as a rule, scarcely ever read any of the most excellent and instructive photographic periodicals, which contain so much information that is essential to the success of a live photographer? These are among the class that argue that even though they should make their work more artistic, it would not be any better appreciated. Why waste time in giving a quality to work from which no pecuniary advantage is to be derived? But is there no such incentive as pride, dignity, or satisfaction in superior work, aside from the amount of money it will produce? Your patrons may be among those that a good likeness will satisfy although it may be false in almost every other respect. But how about yourself? Are you satisfied? If so, it is idle to waste words in your interest.

To succeed exceptionally in any profession, one must become

\* Read at the Minneapolis Convention of the Photographers' Association of America, and reprinted for *Wilson's Philadelphia Photographer*.



something of an enthusiast. But this must be turned to some practical end. If you love your profession, make a study of it in all its bearings the aim of your existence. Turn all your leisure moments to reading, not only all the purely photographic literature, but extend it into the field of art, even if it embraces subjects that seemingly have no practical connection. Seek inspiration in such writers as Ruskin and Hamerton, your light reading with such novelists as William Black, and practical knowledge in such books as Burnet's *Art Essays*. Learn all the principles of art contained in the study of composition, light and shade, invention, arrangement, form, harmony, unity, perspective, &c. In these are contained the secrets of successful posing, grouping, lighting, accessories, and the various component parts that make up an artistic photograph. Remember that to make a fine art of photography, all this knowledge is indispensable. Its artists must have as perfect an understanding of the general principles that underlie all high art as is required by successful painters and sculptors. In other words, they must possess all the theory of the latter, and in place of their necessary skill with the brush or modelling tool, the photographer must have an equal proficiency in the use of the camera and developing tray.

We admire the dextrous ability of a proficient draughtsman. It demands a long, severe training of the eye and hand to acquire superior attainment. Yet drawing without thought or feeling is no higher in rank as an art than the use of the camera. Neither, in themselves, are more than mechanical arts. They are simply the artist's tools, the means to an end, the words by which the language of art is conveyed, and not the thoughts to be expressed. A mere copy by imitation either with the brush or lens might be perfectly accurate, and still be a very low order of art. But when artistic knowledge and judgment are used in the arrangement and selection of the most expressive, and rejection as far as possible of the least important and objectionable features, when the artist is inspired by love and feeling that is so guided by knowledge as to impress a personality upon his work that marks its superiority, then, no matter how humble the means, it embodies the elements that constitute a fine art, whether it be found in a photographic print, the wall paper of a Morris, the coarse clay of the potter of Tanagra, the glassware of Murano, the metal work of Benvenuto Cellini, or the canvass of a Titian.

In claiming art in photography, there is no denying that it has serious limitations. It is sadly hampered in the direction of selection, rejection, invention, and in the means of technical execution. It would be as absurd to insist for it a capacity of expression in the highest realms of creative and imaginative production, as to deny it any adequate art capabilities. Yet its confines lie very near, and will encroach in the future more and more upon the province of the inventive spirit, although from the nature of its execution, its greatest triumphs will ever remain in a realistic presentation to nature. Its appeal to the love of the beautiful and the higher sentiments must be through an artistic representation of facts rather than to a stimulation of the ideal. But is not this in accordance with the growing spirit of the age? Has not classicism and romanticism been obliged to give place to naturalism both in literature and art?

Because the photographer is confined to a narrower field than the painter, is he to be denied the title of artist, when, by a display of the same power and knowledge as the latter, he produces artistic results? Granting that the great majority of photographs produced throughout the country are not works of art, but are the thousands of crude daubs called oil paintings that are hanging on our walls any more entitled to that appellation? Decidedly, no. They are not even respectable company for the children of Duguere. As poor as are the productions of some photographers, any of them are eminently superior to such trash, inasmuch as a mechanical production of the camera must have some semblance to nature, while a mechanical painting seldom has any resemblance to anything celestial or mundane.

But with all the difficulties above enumerated, the photographer has some compensating advantages not enjoyed by the painter. The latter, in order to express something more than the broadest truths of nature, must devote much time and severe labour to the elaboration of details. Thus the happy inspiration of a moment is often lost in days of tedious manipulation. But the photographic artist has only to place his model in just the right light, secure a graceful pose, arrange his accessories with due regard to the composition, determine the most harmonious lines for the draperies, and watch for a favourable expression (all of which require the keenest artistic perception and knowledge), and then the mechanical lens almost instantly

fixes his conception. Here is no time for shifting lights, disarranged draperies, or tired, worn expression.

Then, with the enthusiastic landscape photographer, in his search for the picturesque, how often does his artistic instinct discover beautiful views already composed by nature? Perhaps he may have a short time to wait for certain shadows to lengthen, or lights to fall into masses, so as to bring unity and breadth into his composition, or he may spend a time in search for the most favourable location for his camera, so as to embrace a foreground that will harmonise with the distance. But, this obtained, the faithful sun-god speedily records it upon the sensitised plate.

The landscape painter who wishes to obtain a transcript of this same scene, follows precisely the same governing rules in his selection. He seats himself at his work. An hour is spent in making a rough sketch, and he begins to use his colours. In the meantime, a constant change has been in operation in the view. The lights and shadows have assumed new relations to each other. It is no longer the picture that first attracted admiration. Its superior picturesque effect has departed. The artist is now working from memory, and even this is confused by the new, ever-changing view presented. If he wishes to obtain anything like a finished study he must spend several days in working here for a short time at the opportune hour.

A week of cloudy weather may intervene before the arrival of another such a day when the effect is similar.

In the meanwhile the photographer has continued his rambles. A mass of flying clouds sweep across the heavens in an "innumerable multitude of forms," or by the restless sea the long undulating waves sweep majestically in upon the beach, or break into an infinitude of life and motion upon the resistful rocks. Soap! and another prize is won from nature's domain. How much of this flying movement of vapour or wave could the printer have seized? In fact, it is by instantaneous photography that the present pictorial representation of the moving forms of the sea and sky have been rescued from the conventional symbolism of the past, and their wonderful phenomena produced with so much of their real life and character.

In this necessarily brief paper the full importance of the subject can barely be touched upon, but there are very many cogent reasons that cannot now be enumerated, why it should receive more universal attention. Suffice it to say, that, if the photography of the future does not attain a more worthy and higher position as a fine art, it will be owing more to the neglect of its devotees, than through any failing in its art capabilities.

#### PIZZIGHELLI'S PLATINA DIRECT PRINTING PAPER.

BY W. F. RILEY.\*

IN an evil moment I was beguiled by Mr. Forrest into promising to give you a demonstration on Pizzighelli's Platina Printing Process. Since giving that rash promise, and on calmly thinking the matter over, I have come to the conclusion that there is really very little to demonstrate, the process being so ridiculously simple. I shall not enter into the particulars of the mode of manufacturing the paper; but anyone wishing to prepare their own can do so, and can find the whole process in one of the back numbers of the Journal (I think it was about three months ago), so you see that Captain Pizzighelli, like a true scientist, and one who loves his work, has not made a monopoly of his discovery, or does not compel users of the paper to take out a five shilling licence, but has given the results of his labours to the world.

Although every other branch of photography has advanced of late years, our printing seems to have stood still and made little or no progress. Our apparatus has been improved, our plates are of better quality and more rapid, but our printing processes seem to have had to take a back seat. One thing is certain, Captain Pizzighelli has made a step in the right direction if he has done nothing more, and for this he deserves the warmest thanks of every photographer. We certainly have already some beautiful printing processes, but they all seem to have serious drawbacks; I will now only refer to the two most generally used. First of all there is our old friend the silver print; but making silver prints is, at the best of times, a tedious operation, and the resulting pictures are bound to fade sooner or later, no matter how much care and time has been spent on them. Then we have Willis's platinotype process, by which most artistic and permanent results are got; but for this process we are told we

\* A Communication to the Birkenhead Photographic Association.



must have a strong and clear negative. Now, the general run of negatives are not all strong and clear, more's the pity. Our climate and light are so very variable that it is next to impossible to always get negatives of standard quality, so that the printing process which will find most favour with us is one that will give us good pictures from all negatives, and which at the same time is both a permanent process and an artistic one. All these qualities we have in Captain Pizzighelli's platina process.

On receiving our paper from the dealer, we find it is put up in very neat black envelopes, and that its surface is decidedly yellow. We must place in frame with yellow side to negative, and print to required depth; after a little time we have a grey print, but full of exquisite detail. If we are admirers of grey pictures we must remove the frame at this stage; but if we want black tones we must leave it out to cook a little more, when it will gradually gain tone with but very little loss of detail. When all our prints are done we must mix the following solution:—Ten ounces of hydrochloric acid in seventy ounces of water. Pour about three ounces of this mixed solution in a tray and immerse the prints, keeping them moving about, so that the acid may have access to every portion of the prints. You will then notice that the yellowness begins to disappear, but it is best to give at least two more doses of the acid. Then wash the prints in water for about fifteen minutes, dry, and they are ready for mounting.

The most difficult negative an amateur has to print is a thin one with very little contrast. I will now pass you round such a negative and the platina print from it, and I think you will admit it is not all bad, considering everything.

### INSIDE SWINGING BLINDS FOR THE SKYLIGHT.

BY FRANK ROBBINS.

YOUR recent article on "Awnings for the Skylight" invites my pen to describe a much better and cheaper way of shutting out the direct rays of old Sol from the operating-room.

I used the outside awning eight years ago. It was rather a costly experiment, and the quality of the light was bad, from the fact of the point of diffusion being too far away from the sitter. My present system is very effectual.

Provide a strip of muslin for each sash bar in your skylight, counting the two outer bars. Each strip should be two inches wider than the panes of glass in the skylight, and as long as the sash bars. Nail a thin strip of wood to one edge of each strip of muslin, and tack the other edge of the muslin to each sash bar. You now have the muslin blinds hanging straight down with a



strip of wood on the lower edge of each. In this position they will keep out all sunlight in early morning and late afternoon, while in cloudy weather they obstruct very little light. Now cut the wood strips and muslin into two or three sections according to the length of your sash; stitch a piece of tape across the lower edge of the wood strips in the centre of each section, and drive a tack through the tape into the wood strip. Next pass each end of the tape through a screw-eye in each side of the skylight, and attach cords long enough to reach a convenient point for handling. By pulling either cord the screens swing enough to cut out direct sunlight at any hour of the day.

Many operators think they have not room to swing such a

system of blinds. Yet if they once put them up they will be surprised with the convenience of stopping out sunshine from any part of the room they choose at any time of the day.

I also have a set of slate-colour silica curtains running on wires just below the swinging blinds.

If the skylight is very low, the lower section of swinging blinds can be omitted altogether.

Put up the inside blinds first. The exercise of a little ingenuity will show you how to swing them properly, and arrange any other curtain needful.

I mail a photograph of my operating-room, showing the inside blinds with slate-colour curtains under them. Their use gives perfect control of the light. My skylight is so low that I have only half of it covered with the swinging blinds.—*The Philadelphia Photographer*.

### INFLUENCE OF LIGHT UPON THE EXPLOSION OF NITROGEN IODIDE.

BY J. W. MALLETT.

THE statement of L. Gattermann in his recent paper (*Berichte d. Deutsch. Chem. Gesellsch.*, xxi., 751, following up V. Meyer's paper in same vol., 26) on nitrogen chloride, that its explosive decomposition may be brought about, or its susceptibility to explosion much increased, by exposure to bright light, has recalled to my mind the fact, which did not specially impress me at the time, that I myself undoubtedly observed the same relation several years ago in the case of nitrogen iodide.

In a paper on the preparation and composition of the latter substance, published in the first number of the *American Chemical Journal* (April, 1879), it was noted that on two occasions the product obtained with the composition  $\text{NI}_3$  or  $\text{N}_2\text{I}_6$  "exploded in some quantity under water with much violence and complete shattering of the vessel."

I remember distinctly that in one of these cases I had just carried to a window, through which the sun was shining, the beaker full of water at the bottom of which was the black sediment of iodide, and was gently stirring the liquid with a glass rod, holding the beaker up so as to look at it from below, when the rod touched the lower part of the side or the bottom of the vessel, and the explosion occurred.

In the other case the iodide was being washed with ice-cold water of ammonia, the vessel standing on a table exposed at the time to the direct rays of the sun. I do not remember with certainty what seemed to precipitate the explosion on this occasion, but I believe it was the pouring some fresh liquid, from the height of a few inches, on the black sediment of iodide which had just been partially drained by decantation.

Under ordinary circumstances nitrogen iodide, while wet, exhibits no extraordinary sensitiveness, and may be safely worked with, only becoming highly dangerous on drying, so that I have little doubt that bright sunlight was influential in bringing about these two explosions.—*American Chem. Journal*, Vol. x., No. 4, quoted in *Chemical News*.

### HOW TO PHOTOGRAPH.

BY THE PHOTOGRAPHIC CRANK.\*

No. 1.

I PROPOSE to give a few lessons in photography. I want to make them as simple as possible, and if there are any things that I omit, or if anything I write is not understandable, I will be pleased to explain further in future articles if I receive a postal card from those who are in difficulties. I commenced photographing with a camera that took a photograph five by eight inches. I would have saved lots of hard earned cash if I had taken one just half the size. I use a four by five camera now altogether, as it is quite easy with Eastman's bromide paper to enlarge a picture to almost any size you want, and the small camera gives pictures quite big enough for ordinary purposes, and such a camera is very handy to carry around. When you have chosen your camera, get six double plate-holders. One holder comes with the camera as a general thing; get five extra like it. Of course you can get along with the one, but the six are better for this reason. The dry plates come in packages of twelve. Every time you open the package you have the trouble of very carefully closing it again, and you run the risk of letting some light touch the plates. The six plate-holders take the dozen plates, and the plates are just as safe in the

\* From the *Detroit Free Press*.



holders as they are in the box, if you keep them covered up with a dark cloth in a dark drawer.

Familiarize yourself with the workings of the plate-holders before you attempt to put the plates into them in a dark-room. Number each side of the double plate-holders, beginning at No. 1, and ending at No. 12. Some plate-holders have the word "exposed" printed on one side of the slide. If this is not on when you buy them, it is a good idea to mark each slide with a dark cross, and see when the holders are filled that all the crosses are on the inside. Then when you shove back the slide after exposing a plate, reverse it so that the cross is on the outside, and this will prevent you from exposing a plate twice, which is a thing most amateurs do at first until they find that it doesn't pay.

The next thing is a red lantern. This may cost from two shillings to a pound. I have a number of them knocking about that I would be glad to sell cheap. The one I now use, and the best one I ever had, cost sixpence. I bought a sheet of ruby paper for that amount, and took a wooden box that would hold a small lamp, fixed a door to one side of the box, and cut a hole about six by ten inches on the other side, over which I pasted the ruby paper. I cut a round hole at the top for ventilation, and a number of small holes were bored in the bottom to let in the air. The ventilator hole must be covered with a tin sheet so that white light will not escape. The box may be any size or shape. The only thing to be looked out for is that there is no crevice that will let out a ray of white light. Paste all such over with strips of ruby paper. You will have lots of it left from the fifteen-cent sheet.

If you take my advice, you will stick to one make of plates. In America they are all the same price. In England different makers have different prices. I advise beginners to use the Eastman plates, as the chances are that if he keeps on at photography he will soon get to using the American films or paper negatives, and as the emulsion is the same as that used on the glass plates by Eastman, the change from glass to films will not cause any trouble. A slow plate is the best to begin with.

At first the amateur will not need a regular dark room, although one is a very handy thing to have about the house if a person can afford it. Any room or closet that is completely dark at night will do to change the plates from the box to the holders. When the red lamp is lighted and the room completely dark, except for the dim ruby light, open your plate-box, having previously opened your plate holders and stacked them all ready for use at your left hand within reach. You can easily tell which is the sensitive side of the plate, as one side is clear glass that will reflect the red light, while the sensitive side is a dull, unreflecting grey. Dust this side off gently, and don't hold it too near the light nor look at it too long. See that you put it with the dull side outwards, and when you have fitted two of the plates in the first holder, and seen that it is securely closed up, with the slide in securely, and the black cross not on the outside, place the holder on your right-hand side and fill the next one. Keep the box in which the plates came, as it is very handy to preserve developed plates in. In the box you will find a printed slip which will give you the formula that the makers of the plate recommend for that particular brand. I will, however, give a formula for a condensed developer that will do for any brand of plates, and which will keep better than that given by most makers. Every worker in photography has his own particular formula, which is better than all the others combined. The one I use is known as Beach's formula. It is not my own. Keep to the same kind of developer, just as you keep to the same brand of plates, and get thoroughly accustomed to what it can do. That is one of the great secrets of photographing. The fellow who is always changing the make of plates and getting new developers, never makes very good pictures, although if his money lasts he is a great boon to photographic dealers.

## Patent Intelligence.

### Applications for Letters Patent.

- 11,300. SAMUEL GEORGE HARRISON-DEARLE and THOMAS HENRY ASHCROFT, 186, Fleet Street, London, E.C., for "An improved portable photographic camera."—4th August, 1888.
- 11,510. TYSON CRAWFORD, 27, Southampton Buildings, London, for "Improvements in or connected with photographic cameras."—9th August, 1888.

### Provisional Specification Accepted.

907. FREDERICK BARR, 23, Clarendon Road, Walthamstow, and THOMAS PARSONS WATSON, 313, High Holborn, London, for "Improvements in camera stands."—20th January, 1888.

### Amendment.

In the matter of an application by FREDERICK BARR, of 28, Clarendon Road, Walthamstow, for Letters Patent for the invention of "Improvements in camera stands," dated 20th January, 1888. No. 907.

Notice is hereby given that on the 5th ultimo leave was granted for the application and Specification filed in pursuance of the said application for Letters Patent to be amended in the manner set forth in the Official Journal of the Patent Office, issued on the 12th May last.

The documents have been amended accordingly.

Dated this 11th day of August, 1888.

H. READER LACK, Comptroller-General.

### Patents on which the Fourth Year's Renewal Fee has been Paid.

- 10,950, of 1881. A. H. REED. (Smith.) "Photographic cameras."

### Specification Published.

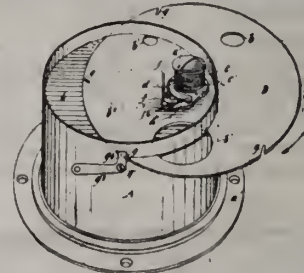
- 12,191. ARTHUR SAMUEL NEWMAN, 87, Evershot Road, Finsbury Park, in the county of Middlesex, Electrician, for "Improvements in shutters for photographic cameras, and in the mechanism for actuating such shutters."—Dated 8th September, 1887.

A shutter after the Spink principle.

### Patents Granted in America.

- 386,857. JAMES T. TONKS, Waterbury, Conn., assignor to the Scovill Manufacturing Company, New York, N.Y., for a "Snap shutter for photographic cameras."—Filed March 28, 1887. Serial No., 232,695. (No model.)

*Claim.*—1. The combination, with a camera lens-tube provided with a transverse partition having an aperture therein, of a revolving shutter adjacent to said partition, and provided with



an opening or openings adapted to be brought opposite the opening in said partition, a post or stud secured in said partition, about which said shutter rotates, said post or stud being eccentric to the axis of the lens-tube, a spring coiled about said post or stud for effecting the rotation of the shutter, and means, substantially as described, whereby the shutter may be relieved from the action of said spring, substantially as specified.

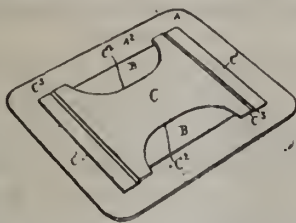
2. The combination, with a camera lens-tube provided with a transverse partition having an aperture therein, of a revolving shutter adjacent to said partition, and provided with an opening or openings adapted to be brought opposite the opening in said partition, a post or stud about which said shutter rotates, said post or stud being eccentric to the axis of the lens-tube, a spring coiled about said post or stud, and secured at one end to the post or stud, a plate loosely surrounding said post or stud to which the other end of said spring is secured, a spring secured near one of its ends to said plate, and near its other end bearing a pin or projection which extends through a hole in said plate, and a lever having a portion adapted to be moved beneath said last-mentioned spring to elevate the same and the pin, or to be moved out from under the same to allow the spring and pin to descend in order to engage the latter with a hole in the shutter, substantially as specified.

- 386,874. IRVING E. FOLTZ, Rockford, Ill., for "Photograph-mount."—Filed March 8, 1888. Serial No. 266,637. (No model.)

*Claim.*—The herein-described photograph-mount, consisting of a front piece having an opening through the central portion



thereof for displaying a photograph, and a back piece having the ends thereof gummed to the said front piece as indicated, and also having the lateral portions of the same cut away, as shown



at C<sup>2</sup>, and the remaining lateral portions C<sup>3</sup> thereof extending beyond the sides of the photograph, substantially as described, and for the purpose specified.

386,875. WILLARD H. FULLER, Passaic, N. J., assignor to The Scovill Manufacturing Company, New York, N.Y., for "Magnesium light."—Filed October 31, 1887. Serial No. 253,820. (No model).

*Claim.*—1. The combination, with a case or shell, of gun-cotton and magnesium contained therein, and a coating of collodion or equivalent material outside the gun-cotton and magnesium, substantially as specified.

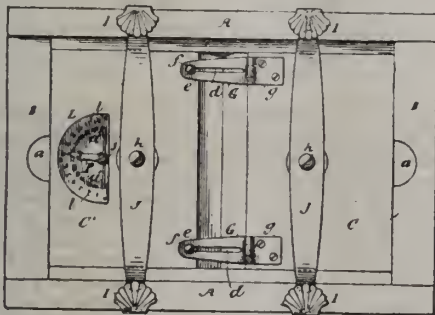
2. The combination, with a case or shell, of gun-cotton and magnesium contained therein, a coating of collodion or equivalent material outside the gun-cotton and magnesium, and a fuse, substantially as specified.

3. The combination, with a case or shell, of gun-cotton and magnesium contained therein, a coating of collodion or equivalent material entirely surrounding the gun-cotton and magnesium, and a fuse, substantially as specified.

4. The combination, with a case or shell weighted at the bottom, of gun-cotton and magnesium contained therein, a coating of collodion or equivalent material outside the gun-cotton and magnesium, and a fuse having a portion embedded in the mass of gun-cotton and magnesium, and a portion extending above the surface thereof, substantially as specified.

386,876. WILLARD H. FULLER, Passaic, N.J., assignor to The Scovill Manufacturing Company, New York, N.Y., for "Photographic printing-frame."—Filed March 10th, 1888. Serial No. 266,873. (No model).

*Claim.*—In a photographic printing-frame, the combination, with a back composed of two portions hinged together, of a device for retaining said portions in an elevated position, consist-



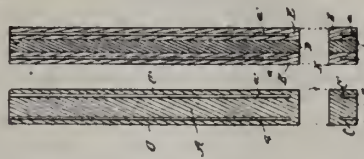
ing of a hinge having one leaf secured to one of said portions of the back, and a projection on the other portion with which the other leaf of the hinge is connected with a sliding connection, substantially as specified.

386,907. ABNER G. TISDELL, Brooklyn, N. Y. for "Photographic plate-holder."—Filed August 20th, 1887. Serial No. 247,122. (Model.)

*Claim.*—1. As a new article of manufacture, a photographic plate-holder having frame-sections each composed of three pieces of wood suitably attached, the grain of the central pieces running lengthwise of the sections, and the grain of the exterior pieces running at right angles to the grain of the central pieces, the said frame being provided with a shutter groove or grooves formed in the said exterior pieces transverse to the grain thereof, substantially as described.

2. In a photographic plate-holder provided with an exposing-shutter and grooves for the said shutter, the combination of the pieces D D D and the pieces E E E, and the grooves for the ex-

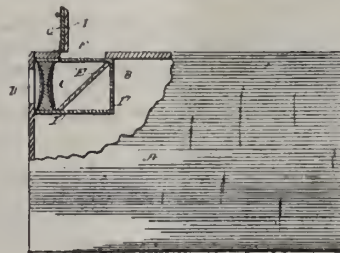
posing-shutter, formed in the pieces E, transverse to the grain thereof, the grain of the several pieces composing the sections running substantially as described.



3. In a photographic plate-holder, the combination of the frame having grooves for the exposing-plate, a back K, a spring which forces the plate upward, and a head-block lying close to the said back K and having its edge adjacent thereto bevelled to the same, as at b, whereby the force of the spring is caused to press the plate close against the back, substantially as described.

386,996. WILLIAM H. LEWIS, Brooklyn, assignor to E. and H. T. Anthony & Company, New York, N.Y., for "Photographic camera."—Filed January 6th, 1888. Serial No. 259,999. (No model).

*Claim.*—1. The combination, with a photographic camera, of a finder consisting of a concave lens and a reflecting-surface placed behind the lens and at an angle thereto, and apertures in the camera in front of the lens and above the reflecting-surface,



the latter provided with a cover having a mirror on its under side, substantially as set forth.

2. The combination, with a photographic camera, of a finder consisting of a concave lens, a diaphragm covering a portion of the lens having a square aperture therein, and a reflecting-surface placed behind the lens and at an angle thereto, and apertures in the camera in front of the lens and above the reflecting-surface, substantially as set forth.

3. The combination, with a photographic camera, of a finder consisting of a concave lens, diaphragms applied over a portion of the lens, a reflecting-surface placed behind the lens and at an angle thereto, and apertures in the camera, one in front of the lens and another above the reflecting-surface, the latter being provided with a cover having a mirror on its under side, substantially as set forth.

4. The combination, in a finder for photographic cameras, of a concave lens, a mirror placed behind the lens and at an angle thereto, and hair-lines or their equivalent to determine the centre of the picture, substantially as set forth.

5. The combination, in a finder for photographic cameras, of a lens, a diaphragm covering portions of the lens, hair-lines or their equivalent which intersect at or near the centre of the lens, a mirror placed behind the lens and at an angle thereto, an aperture in the camera in front of the lens, and another over the mirror, and a cover for said last-named aperture provided with a mirror on its under side, substantially as and for the purpose set forth.

6. A finder for photographic cameras, comprising a finder-box complete in itself when separate from the camera, made substantially as described and shown, and having an opening at one end and another at the top provided with a cover, a concave lens, a reflecting-surface behind the lens set at an angle thereto, and another reflecting-surface arranged on the under side of the cover, substantially as set forth.

7. A finder for photographic cameras, comprising a finder-box complete in itself when separate from the camera, made substantially as shown and described, and having an opening at one end provided with a lens, and another at the top, and two reflecting-surfaces, the first arranged to receive the image from the lens, and the other to receive it from the first by reflection, substantially as set forth.



## Correspondence.

## RETOUCHING.

SIR,—“The fear that photography is becoming a slave to the fatal dexterity of the retoucher.” This last part of Mr. Heighway’s article will have been to some the most interesting. I have myself long been hoping for a critic who should coldly, calmly, and accurately point out the “rejuvenescing” spirit in the camera of Her Majesty’s photographers. The frame of the last sentence is confessedly borrowed from 1 Kings xxii., but as it would be unkind to call them “lying” prophets, I have varied the expression.

Here is another notable instance. Some of us keep up Dr. Johnson’s habit of a walk down Fleet Street. In a window will be seen the portrait of a lady, known to many as clever, enthusiastic, kind-hearted, and, above all, truth-loving; so much so, that she cannot bring herself to adopt conventional epistolary forms, but signs herself “Sincerely, Annie Besant.” Yet she encourages the exhibition and sale of a portrait, the negative of which has, by the retoucher’s pencil, been metamorphosed into — the misguided offspring of a wax model and a too-trusting China doll.

Again, “My age is 50, but thanks to Pears’ soap, my complexion is 17.” Many a photographer, on seeing the picture with the quaintly ungrammatical subscription, must have thought, “Graphite and diamonds are identical, no doubt; but I never heard Cumberland lead called soap before.”

Don’t be afraid, Mr. Heighway! Photography will ever right itself, and photographers “never, never, never—well hardly ever—shall be slaves!” “So fine a fear in our large Lancelot.”—Sincerely,  
W. GREATHEED.  
67, and 69, Chancery Lane, 18th August, 1888.

## WILSON’S HANDBOOK.

DEAR SIR,—I should not be concerned to offer further comment on the subject of Mr Wilson’s “Quarter Century,” but that you, Sir, appear to have seriously misconstrued the drift of my complaint. No doubt the fault is entirely my own. I do not, however, like to labour under the imputation that I accuse Mr Wilson of plagiarism. I made no such charge—the form of his book renders such a suggestion absurd—nor did I complain of the *quantity* of “scissors-and-paste” matter, but distinctly of its *quality*, and especially of the want of editorial care. An amusing evidence of this is furnished in the extracts you reprint, where Mr. Wilson betrays his ignorance of the difference between retouching the negative and spotting the print, or great carelessness in placing Mr. Gibson’s hints on spotting out defects in photographic prints in a chapter devoted to “Retouching and Decoloring the Negative.”

I am most pleased to see that you give these “selected articles,” as they fully prove my contention that a lot of indifferent and purposeless stuff (as far as its use in the book is concerned) has been literally pitchforked together and dubbed “A Complete Text-Book of the Art.” As I said, I am indebted to you for reprinting these selections, although you half suggest an unfair suppression of them on my part. I may say I did not dare to ask you to allow me to reproduce these four-and-a-half columns of “selected articles,” as I did not for a moment dream that you could or would afford space for them, or that they were worth reprinting; and also because I felt that my argument was strong enough without this further evidence.

In speaking of “original matter,” I may explain the distinction was as between the work of Mr. Wilson’s pen, and his scissors and paste-pot. I did not suppose Mr. Wilson had ever originated anything in photography

except this new and original way of manufacturing “Complete Text-Books of the Art.”—I remain, dear sir,  
yours truly,  
WILLIAM HEIGHWAY.  
29, Bedford Street, Covent Garden, London, August, 13, 1888.

## REDUCING THE DENSITY OF NEGATIVES BY VARIOUS AGENTS.

DEAR SIR,—On reading the above article by Mr. Charles Ehrmann on page 506 of last week, it struck me that I had previously read something relating to a spent oxalate developer used in conjunction with a fixing-bath before, which to-day I happen to come across again in the “Journal Almanac” for 1882, wherein a correspondent advocates the use of about an ounce of old ferrous oxalate developer to be added to a pint of fixing solution, allowing the plate to remain therein for ten minutes. He says it gives very brilliant negatives, and recommends everyone to try it.

I may here add, that I have often reduced a negative by flooding it with a normal fixing solution to which I have previously added a few drops of cupric chloride solution.—Faithfully yours,  
A. TREYER EVANS.

Newport, Monmouthshire.

## PHOTOGRAPHIC GRIEVANCES IN CANADA.

DEAR SIR,—I would like to make a few remarks with reference to a letter of Messrs. Notman and Son, published in your issue of the 3rd inst. The gist of Messrs. Notman’s letter is to make out that the photographers of Canada suffer no grievance in consequence of recent legislation which places a prohibitive duty, for such it was meant to be, upon imported dry plates. Now considering that a brand like Ilford has to pay something like 90 per cent. duty before it can enter the Dominion, it must be a great disappointment to those who worked the oracle, to find that in spite of their efforts the importation of plates of some brands has practically suffered little diminution. But here lies another side of the question—that is, the question of forcing Canadian photographers to use a brand of plates that they justly have no faith in working. I would not speak so emphatically if I had not recently made a tour through Canada, and have, to some extent, been behind the scenes. As regards getting good negatives with the Canadian Stanley plates, that is easy enough—just as easy as it would be to get good negatives with the worst English plates in the market—and this consequently means nothing. But here are facts.

The Canadian Stanley plate is a very different brand from the United States Stanley; the latter possesses a certain recognised rapidity, and is practically uniform in quality. The Canadian Stanley, besides wanting in uniformity, are really nothing more than slow plates (I do not say rapid plates are *never* made), about three times slower than “Ilford Ordinary,” and therefore about six times slower than “Ilford Special Rapidity;” and moreover I found that no photographer of repute would think of buying a stock of the native brand without first testing carefully a sample of the batch offered for purchase.

Supposing, therefore, that Canadians pay the same for plates as before the “prohibition” duty, they have to purchase both a slow and unreliable plate; but as most photographers of repute have no intention of using an inferior article, they have no resource but to submit to the fresh handicapping of their struggle for existence and good work, and to purchase, as they have hitherto done, a reliable British or American Brand. Is this no “real grievance?” If Messrs. Notman think it is not, Canadian photographers justly think it a very serious one. But why should Canadian photographers be obliged to purchase a brand of plates simply because Messrs. Notman are interested therein?

JOSEPH J. ACWORTH.

Sheldmont, Shootup Hill, Brondesbury, N. W., August 14th.



## Proceedings of Societies.

### NORTH LONDON PHOTOGRAPHIC SOCIETY.

An ordinary meeting was held on August 7, at Myddleton Hall, J. TRAILL TAYLOR in the chair. W. P. Dando was elected a member.

A. MACKIE read a report from the President and the Rev. E. Healy, certifying that the accounts of the Smith Testimonial Subscription had been duly inspected by them and found correct.

The PRESIDENT commenced the discussion on "Intensification" by briefly describing the more important methods, from the calotype process to the present time. He said that Mr. Fox Talbot recommended increasing the proportion of aceto-nitrate in the developer when a dense (calotype) negative was required. When Scott Archer introduced the collodion process, he recommended the addition of nitrate of silver to the acid pyro developer for the purpose of strengthening the image. Later on, when the iron developer superseded the pyrogallic, a weak solution of pyrogallic acid, to which a little nitrate of silver was added, was used after development, and was proved to be remarkably efficacious, remaining in use till the present time. A considerable number of intensifiers have been devised for application to the negative after fixation. The image is, in the majority of cases, converted to a chloride, which is afterwards blackened by the application of a second solution. The earliest form of this intensifier was introduced by Mr. Carey Lea, of Philadelphia. The plate was whitened by the application of bichromate of potassium and hydrochloric acid, and, after washing, was immersed in a solution of Schlippe's salt; this turned the deposit to a reddish colour of great chemical opacity. The lead intensifier of Eder and Toth also gives great density, and is excellent for negatives of line subjects. Many of this class of intensifiers are suitable for gelatine films as well as collodion, and amongst them might be mentioned bichloride of mercury, followed by a weak solution of either hyposulphite of soda, sulphide of ammonium, ammonia, or sulphite of soda; the latter salt possesses the advantage of not requiring such thorough washing between the various manipulations as the others do. The best, however, of what may be termed the bleaching processes is that generally known as Dr. Monckhoven's. The plate is whitened in a solution of bichloride of mercury and bromide of potassium, and blackened by the application of a dilute solution of cyanide of silver. Where only a slight increase of density was needed, a weak solution of iodine was useful; where more density was needed, a very convenient one-solution intensifier could be made according to Selle's formula—ferricyanide of potassium and sulphate of uranium. The dusting-on process applied to the back of the plate permitted almost any amount of density to be given to the thinnest negatives.

Mr. MACKIE said that he believed he was the first to suggest this application of the dusting-on process. He had, however, found that the constant variation of the amount of moisture in the atmosphere rendered the process too uncertain to be of any practical value. He thought Monckhoven's the best intensifier yet known for gelatine plates. All the mercurial processes yielded fairly permanent results if carefully carried out, sulphite of soda being perhaps the best blackening agent; unfortunately, it did not work with all brands of plates, some appearing to gain little, if any, density after treatment. Where only a small increase of density was necessary he preferred immersing the negative after fixing in a bath of sulphate of iron; this seemed to lighten the negative, and at the same time materially increase the density. Plates so treated could afterwards be intensified with any of the ordinary mercury intensifiers, but would not completely bleach, the deposit remaining of a buff colour; this did not, however, interfere with the subsequent blackening.

The PRESIDENT asked if Mr. Kennett did not first suggest the use of sulphate of iron for this purpose.

Mr. MACKIE answered in the affirmative, but said Mr. Kennett added it to the fixing bath, and one did not always know before fixing whether the negative was not already dense enough. His modification consisted in applying the iron solution after fixing.

The PRESIDENT said that for line work a bleaching solution of bromide of copper followed by a solution of silver nitrate or Schlippe's salts was very useful.

F. W. HART said that he had found the ordinary mercury and ammonia developer so efficacious that he had not experimented

very much with any other. He had lately seen some very fine results produced with the cyanide of silver.

E. CLIFTON said that he had used Monckhoven's intensifier for some years, and had found it very satisfactory; the solutions could be used over and over again until they failed to act. The bleaching solution was—

Bichloride of mercury	...	...	...	10 grains
Bromide of potassium	...	...	...	10 "
Water	...	...	...	1 ounce

After thoroughly whitening, the plate is well washed and immersed in—

Cyanide of potassium	...	...	...	10 grains
Nitrate of silver	...	...	...	10 "
Water	...	...	...	1 ounce

and after the blackening action has gone through the thickest parts of the deposit the plate is well washed and dried.

Mr. MACKIE spoke well of this formula, and said that negatives so intensified could be reduced, if too dense, by immersion in a weak hypo bath. A weak acid bath would reduce negatives intensified by the ordinary mercurial intensifiers.

Mr. HART said chlorine water was also used for the same purpose.

Mr. CLIFTON said he had tried the mixture of iron, alum, and citric acid, recommended by B. J. Edwards, but had not found it to answer well. When the silver solution was added to it, as directed, there was a tendency to precipitate.

Mr. HART had tried a somewhat similar formula, published by Wratten and Wainwright, but had failed to obtain satisfactory results.

Mr. BISHOP thought the ordinary mercury and ammonia intensifier answered well, and seemed to be permanent. He preferred, however, to obtain density in development by using a second developer strong in bromide and pyro after all the detail had been brought out by a normal developer.

Rev. E. HEALY had succeeded in getting printing density on a plate exposed about two hundred times too much by soaking in an eight-grain solution of pyro, and cautiously adding ammonia.

Some excellent collodio-bromide transparencies by F. Dunsterville, of Madras, were then passed round, and received considerable attention.

On August 21, "The Capabilities and Shortcomings of Single Lenses" will be discussed.

The outing on Saturday will be to Hale End, assembling at that station about a quarter past three, and working through the Forest to Chingford.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The usual weekly meeting was held on Thursday, August 9th, W. COBB in the chair.

The CHAIRMAN read a letter he had received from A. L. Henderson, staying at Wiesbaden, stating that he was improving in health.

J. B. B. WELLINGTON passed round some silver prints from negatives taken at the previous Bank Holiday outing. A yellow screen had been used on this occasion; the effect was noticeable in the marked contrast of portions of the foliage of the trees in the picture.

The CHAIRMAN asked whether any difference had been found in using coloured glass as a screen, or coating a plate of glass with a coloured film.

J. B. B. WELLINGTON said the example before the members was the result from a sheet of glass coated with collodion stained with turmeric; the screen was fixed midway in the bellows of his camera.

F. A. BRIDGE preferred the screen close up to the back of the lens.

The question whether the image was interfered with by the difference of position of a glass plate fixed behind the lens opened up some little discussion.

P. EVERETT questioned whether the erythrosine bath, if left exposed to light for any length of time, did not deteriorate.

J. B. B. WELLINGTON thought not; he had a solution that had been exposed to the light for the past six months, and found no appreciable deterioration.

The CHAIRMAN exhibited some prints by the Pizzighelli process, and also several prints from paper that he had prepared himself; the latter he did not consider very successful. The



sepia tone, however, of some of these were considered very good. He had found the printing very slow.

A. COWAN showed prints of the group taken at the outing at Chesham.

## Talk in the Studio.

**LINSEED AS A SUBSTITUTE FOR GUM-ARABIC.**—A Tunbridge correspondent sends the following:—Linseed is recommended as a substitute for gum-arabic. The seeds are first boiled with water for an hour, the resulting thick mass filtered, and then treated with twice its volume of 90 per cent. spirits of wine. A flocculent white precipitate separates, from which the dilute spirit can be readily decanted. A yield of 10 per cent. of dried "Gummi Lini" on the weight of the seeds taken is obtained. The gum forms a clear, grey-brown, fragile mass, which dissolves in water without taste or smell, similarly to gum-arabic. Two grammes are sufficient to form an emulsion with 30 grammes of oil, which resembles the emulsion formed with gum-arabic, both in taste and in appearance.—*Burgoyne's Monthly Magazine of Pharmacy.*

**MISUSE OF THE TERM SCIENCE.**—The *Scientific News*, commenting on a report by Emden, the theatrical architect, says:—"In concluding this notice of a very useful memoir, we cannot help taking exception to the following passage:—The Stage is still, to a large extent, ignored by the State and by science. Science has, of late years, turned industrial. She makes railroads, steam-engines, factories, and mills; she tins meat and condenses milk; but she has not troubled herself about the Stage, and is only now waking to its necessities. We have here the misuse of the term science against which Herschel, Humboldt, Whewell, Grove, Lewes, and Crookes have all in turn protested, but, as we see, in vain. Science does not make tin, or condense anything. She discovers facts, traces out their relations, and reduces them to laws. The utilisation of such facts and such laws she leaves to industrial art, over whose doings and omissions she has no control."

**INTERNATIONAL COPYRIGHT OF PHOTOGRAPHS.**—A. E. Whitehouse, of the Hyde Park Gallery, 30, St. George's Place, S.W., appeared before Mr. d'Eyncourt, at the Westminster Police Court, yesterday, to answer eighteen summonses under the Copyright Act of 1862 (25 and 26 Vict., chap. 68) at the instance of Mr. Charles Hauff, the London agent of Messrs. Adolphe Braun and Company, of Paris, charging him with selling and multiplying for sale pirated copies of their registered copyright photographs—La Longeuse, La Beequée, En Bacchus, and A. Cythère. Mr. Mann (Mann and Taylor) appeared for the prosecution; and Mr. R. C. Glenn was counsel for the defendant. Mr. Mann said that Messrs. Braun and Co., the well known photographers of Paris, had been in the habit of acquiring from artists of celebrated pictures exhibited in the Salon the right to take negatives for the purpose of producing a copyright photograph, copies of which could be sold. Within three months of the opening of the Salon they registered their copyright at Stationers' Hall, England. In 1862 photographs first became the subject-matter of copyright to the author, being a British subject. The author was the person who made the negative, not the mere operator. The Act of 1862 dealt only with the right of a person who was a British subject, but it incorporated the International Copyright Act of 1844, which provided that an Order in Council might be made giving to subjects of foreign countries with whom a treaty or convention might be made the same right of acquiring a full and perfect copyright in their works in this country as an Englishman possessed, subject of course to proper registration. In 1886 the copyright law was amended and consolidated, but it did not take away a foreigner's right of registration in this country, and therefore, by an Order in Council made Jan. 10, 1882, following a treaty or convention with the French Republic, the complainants, who had done everything which the law required to preserve their property rights, complained that the defendant had and still continued to infringe them by selling and exposing for sale the photographs specified in the informations. Mr. d'Eyncourt pointed out that the proceedings were under the Act of 1862, which admittedly only applied to British subjects. It was a case of very great difficulty. Mr. Mann said the complainant was proceeding as if he was a British subject. To all intents and purposes, the Order in Council following the International Copyright Act of 1844 made him one. Mr. Glen stated that his idea

of the law was very different from his friend's. This case was of great importance because it raised a large international question, and he thought that it ought to be argued in one of the superior courts. The complainants had no copyright they could register in this country. Mr. d'Eyncourt: I confess I should not be sorry to find I have no jurisdiction. Mr. Mann: But you have, sir. You have express jurisdiction conferred by statute. After a great deal of additional argument as to the provisions of the International Copyright Acts, the magistrate adjourned the case, the learned counsel for the defence stating that his client claimed the right to sell the pictures in dispute. *Daily Chronicle*, August 11th.

**WALKS IN THE ARDENNES.**—This is the title of a sixpenny book by Percy Lindley, illustrated by Julian Weedon, and published at 125, Fleet Street. The book touches not only on touring in the Ardennes, but also deals pleasantly with those portions of the Low Countries with which the tourist will be concerned in reaching the pleasant parts of Belgian Luxembourg. Some of the illustrations are very pleasing, the two views of the Scheldt being well worth the price of the book.

**PHOTOGRAPHIC CLUB.**—The subject for discussion on August 22nd will be "Stereoscopic Work." Saturday outing at Highgate. Meeting at the Gate House.

## To Correspondents.

\* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER AND CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

R. B. BAKER.—1. We do not think you can obtain commercially any rolls of paper anything like so small as you require, but all makers of machine-made papers will supply the paper in rolls if enough is ordered at a time; 30, 36, 40, and 54 inches are usual widths, and a roll will ordinarily weigh several hundredweight. Lloyds, of Crown Court, Fleet Street, or Spalding and Hodge, of Drury Lane, will supply a suitable paper at from 5d. to 7d. per pound. 2. A less well made paper suitable for this purpose would cost about 3½d. per pound. 3. Copper foil down to about a hundred and fiftieth of an inch thick can be had in rolls from Smith, 23 and 24, St. John's Square, Clerkenwell, London.

J. WHITBOURNE.—You are not likely to have any difficulty, either with the Belgian Customs or the street authorities.

F. M. SUTCLIFFE.—The spots are due to hard pieces in the paper, and they will be far less noticeable if you allow a longer time on the sensitizing bath.

F. R. FRASER.—1. We know of no such plates; but those made in America will generally stand a higher temperature than those made in Europe. 2. No, because the demand for them is less.

G. and V. LAVIS.—The result is very interesting, and we should be glad to have details as to the preparation of the plates.

JOHN DAVISON.—Your suggestion is an excellent one, and we have already taken steps in the matter.

E. WILLIAMS.—Your negatives, in this case, must have been almost like sheets of plain glass. In fact, the whole of the surface is far blacker than any part of an ordinary photograph. Take one of the prints and gum two pieces of white paper on it so as to leave a dark line, or cut a small hole in a deep shade of a silver print and lay it over the lightest part of such a print as you send us.

LEX.—The picture in question is either at Amsterdam or the Hague, we are not quite sure which, but there is an excellent replica of it in our own national collection. We do not know where you can obtain a photograph of it, but you can try Spooners, in the Strand, or Mrs. Evans, Duncannon Street.

## The Photographic News.

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# THE PHOTOGRAPHIC NEWS.

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### CLOUD EFFECTS IN PHOTOGRAPHS.

WE sometimes meet with a good deal of complacent utterance on the superior artistic effect of modern photographic landscapes in which sky effects are introduced, coupled with a sort of compassionate reference to the days when, it is said, it was the highest praise to speak of a negative as having an absolutely opaque sky. We think, however, that it might be questioned whether, on the one hand, the free use of printed-in skies is not more frequently than otherwise productive of a result which is neither true nor artistic; and, on the other hand, whether there was at any time such a general approval of a blank whiteness in the skies, and absence of endeavour to obtain the beautiful effect of nature as exhibited in the varied masses of cloud and clear sky, as is implied in the position thus taken up.

That there has been from very early days an appreciation for natural cloud effects in photographs, and an endeavour, not without success, to obtain them, may easily be demonstrated. One set of pictures alone, the photographs of sea and sky produced by Gustave Le Gray some thirty years since, will suffice to show that there was in the early days of photography no lack of recognition of the beauty which existed in the atmospheric regions, or of the improvement which a representation of these beauties conferred upon the photographs in which they were delineated. We think that some latter-day photographers would be rather surprised, if brought to a collection of the best work of this character, produced so long anterior to the gelatine bromide process, the rapidity of which they may suppose to be essential to anything like a decent representation of the fleeting effects of moving water and sky.

The other part of the question, that as to whether the free use of printed-in skies, so commonly indulged in, is generally speaking an advantage, and if not why it should be disadvantageous, and under what conditions the representation of cloud effects may be satisfactorily introduced so as to be an improvement to the picture, is the one which will be of most present interest, and is that which we propose now to discuss.

There are two distinct faults, often met with separately, and not infrequently seen in combination, in the case of skies artificially introduced into photographic pictures. The first fault is that of badly printing in, and the second that of inappropriate selection of sky negative to accompany the landscape. When thus combined, as is by far too common, there is no doubt that a plain clean blank space to represent the sky is much to be preferred. Referring to the first evil—that of the sky being badly printed-in—we have frequently seen at photographic exhibitions, pictures in which there has been a sort of vignetting of the objects bordering on the sky, in order to obtain a clear space for printing clouds upon, and then the cloud negative has been softened at the edges, or similarly vignettied, as it

were, in order to avoid any sharp edge from being noticed. We can call to mind—and no doubt many of our readers can do the same—cases wherein the foliage and twigs bordering on the sky, even in foreground objects, and the masts and cordage of boats and ships in a similar situation, have been thus weakened and reduced to mere smudginess. The effect has been, in so far that there can be said to be any effect other than that of being spoiled by the proceeding of sky printing, to represent these parts of the picture as half lost in smoke or fog. Some of the weakness we speak of may be due to halation, but if such exist, there is no need to exaggerate and emphasize it by the senseless method of sky printing to which we have referred. Contrast such a flat, stale, and unprofitable work with the beautiful, forcible delineation of twig and leaf, mast and cordage, against the sky, which will be found in good paintings, and in the most successful photographs. There is no need, with this striking representation of near objects against the sky, to have anything like harshness. It is Nature's own representation, beautiful to the eye, and beautiful when properly reproduced, either by painting or photography.

We have spoken particularly of the evil of weakening near objects when in juxtaposition with the sky. With distant objects the excuse may be put forward that it is right that they should appear somewhat subdued and lost. Certainly they should; but aerial perspective does that for us, and the tendency of the photographic process is commonly to make them appear too faint. Even distance, therefore, will generally be injured by the double softening involved in the method of sky-printing of which we have spoken.

Another fault which belongs to the manipulation of the sky negative, is one that is not so often met with, and consists in the leaving of a visible edge to the printing that is done from the cloud negative. This fault and its remedy are so obvious, that there is no need to go further into the matter. The other part of the question, that of the selection of cloud negatives appropriate to the picture to which they are to be added, is one on which much might be said. It is, however, a fact that people generally are so little observant of the atmospheric phases of nature, that a cloud scene taken almost at random will, if carefully printed-in, and not made too dark, convey the idea of an improvement upon a blank sky, to the majority of those looking at it. That this failing to notice critically the kind of sky and clouds in nature that accompany particular scenes, extends beyond the general uncritical public, is evidenced by the fact that many paintings—even those exhibited in our Royal Academy—are declared by competent judges to err in this particular.

Those who desire something more than to add to their landscapes a certain prettiness that will please the uncritical, will endeavour to select cloud negatives represent-



ing such a condition of the sky as might be in keeping with the rest of the picture, both as regards possibility or truthfulness, and artistic effect as satisfying the eye of the spectator. Towards the fulfilment of these conditions certain rules or common-sense principles may be laid down. One point to be observed is that the sky printing should not be carried to too great a depth. There are certainly special occasions when the sky may appear very dark and lowering, but in ordinary landscape work, when a fair-weather scene is represented, it is only the highlights of the picture that will appear lighter than the darkest part of the sky. Moreover, if there is anything wrong or unsuitable in the cloud negative, it may pass unobserved when lightly printed, whilst, if printed deeply, the errors of selection will be so much the more prominent. Defective manipulation, too—such as showing a white line or decided edge—will be so much less noticeable, and more easily remedied by touching, when the sky printing is kept light.

When deciding to print-in sky backgrounds, there are two courses open to the operator. The first, and probably most usual course, is to purchase cloud negatives from those who make a speciality of this branch of photography. In favour of this plan it may be urged that it is by no means an easy thing to secure clear, vigorous negatives of a cloud character by those who are only accustomed to ordinary work with the camera. Then, again, there may be considerable delay in waiting for a favourable sky for the purpose. In towns, moreover, there is commonly such an amount of mist or smoke as to interfere with the work; whilst in towns, again, it may not be practicable to get such an extent of sky clear of obstruction down to a tolerably low horizon, as it is desirable to have for sky negatives in general. Whilst on this last point, we may mention that we have met with the statement that it is a mistake to take a sky negative to a low horizon, as clouds low down have not the forms which ought to be introduced higher up in the picture. The latter clause of this statement is evidently true, but it does not involve the former part. On the contrary, it is as wrong to print clouds belonging to a part of the sky near the zenith, low down towards the horizon, as it is to print horizon clouds high up in the picture; and if the cloud negative itself is not taken to a tolerably low horizon, it becomes necessary, when printing a negative having some part of the horizon low, as is usual with the greater number of landscape negatives, to bring clouds properly belonging to the upper part down to the horizon. It is therefore desirable that the cloud negative itself should be taken down to a low unobstructed horizon. When the subject of the landscape or scene is such that there is no low horizon, of course only the upper part of the sky negative will be required and will be used. A drawback to the use of purchased cloud negatives is the possibility of seeing the same clouds figuring in landscapes by different operators. On the other hand, in addition to the advantages which we have pointed out, there is the advantage that purchased negatives are generally on paper, and may therefore be printed from either side so as to suit the direction of light prevailing in the rest of the picture.

Whether the cloud negatives are the work of the landscapist himself, or are purchased, there are certain rules which should guide him in the selection of a particular sky. Such, for instance, as that of a calm, sunshiny picture, should not be accompanied by clouds characteristic of a stormy or tempestuous scene. Common-sense, added to an attentive observation of nature, will best guide the photographer in this matter. One of the most daring flights of incongruity, but one which many of our readers will doubtless remember to have met with, is the combination of a sky having powerful masses of cloud behind which the sun is evidently shining and illuminating their edges, with a scene in which there is sunlight illumination, coming from one side or from behind the camera.

The time is at hand when many workers are preparing negatives and prints to figure at the autumn and winter

exhibitions. We hope to see that the faults which we have mentioned as so disfiguring to landscape photography have become rarer, and that it will be more universally realised that printing clouds into a landscape sky is by no means certain to be an improvement, but is an operation that, to be successful, requires considerable judgment in selection, and great care and nicety in execution.

### THE MEISENBACH METHOD OF BLOCK-MAKING—A PATENT VOID.

THE feature which is considered most characteristic of the Meisenbach method of producing a grain is the use of a grating first in one position and then in another (generally at right angles to the first), a proceeding which, undoubtedly, gives a more plastic and searching grain than the use of a graining screen consisting of two series of lines ruled over each other.

As one of the Meisenbach Patents (No. 2156 of 1882) has been declared in the official journal of the Patent Office to be void for non-payment of duty, it is interesting to give further working particulars of the best development of the method indicated (but not very clearly expressed) in the specification, and in doing so we take the substance of what has previously appeared in the PHOTOGRAPHIC NEWS:—

The old idea of placing a network between the half-tone negative and the photo-lithographic paper on which the transfer is made, and thus breaking up the tone, is one which has been modified in several ways of late. The term network must be taken in a very wide sense, and includes film negatives obtained by photographic and mechanical processes from originals of various kinds; one of the simplest ways of getting such a network film being to photograph a sheet of paper or card-board which has been ruled with closely and regularly spaced cross-lines, and to strip the film from the negative thus obtained; while another method is to work a grain on a lithographic stone, and to make a vigorous impression of this upon thin or translucent paper.

A finely-woven gauze stretched on a frame was found to be fairly satisfactory, excepting as far as its texture was found to be uneven; threads of unequal diameter occurring here and there, and consequently damaging the result.

Husnik has simplified the method, and gives the following particulars:—

In the first place a series of clean parallel lines are engraved upon a polished lithographic stone, it being necessary to use a diamond point and a good ruling machine, and the lines should be so close together that there are about a hundred or a hundred and thirty to an inch. The stone thus prepared is got ready for printing in the usual way, and impressions are taken upon dull surfaced enamel paper. One of the impressions is then photographed, either on the same scale or slightly reduced, but two negatives are made; one with lines corresponding to the long way of the plate, and the other with the lines corresponding to the narrow way of the plate.

The photograph to be copied is now focussed, and one of the line negatives is interposed between the objective and the sensitive plate, and, indeed, quite close to the latter. About half the exposure is now given, after which the lined plate in front of the sensitive surface is replaced by that lined plate on which the ruling is in the contrary direction, and the remainder of the exposure is given. On development there is obtained a negative on which the gradations of the original are fairly translated into a network grain, and which negative yields by the photo-lithographic transfer process, by the asphalt process, or by the albumen process, a relief block having all the good printing qualities of the best commercial work.

In Husnik's book is an illustration printed from a block made from a grain negative by this process, and we have had this illustration reproduced by the ordinary method. It has suffered somewhat in reproduction, but gives a good idea of the value of the process.

Meisenbach, in his specification, does not make it very clear that the "shifting" is turning round so as to bring one set of lines at an angle to the other, although this seems to have been the meaning. He says:—



A transparent plate is hatched or stippled in parallel lines. A transparent positive is made of the object. The two plates are joined, preferably face to face. From the combined plates a definite negative is photographed in the ordinary manner. In order to cross-hatch and break the lines of the shading for obtaining a more plastic appearance of the printings made from the typographic or other block, the hatched or stippled plate is shifted or moved once or more during the production of the said definite negative. This negative is transferred in the usual manner on to a plate of suitable material, which is grained or etched in the usual manner to form a typographic block. For the engraving plates the negative is transformed into a positive, and the latter is transferred on to the etching plate in the usual manner. The negative produced from the combined plate may also be used for the production of photographs and photo-lithographic plates. Both the object and the hatching or stippling may be produced photographically on one and the same plate, in place of using two separate plates, and this plate used direct for the production of an engraved plate. On the other hand, when typographic blocks, photographic or photo-lithographic plates, and the like are required, a negative must be made for transfer. To obtain cross-hatched or broken shading its original is moved during photography. Having thus described the nature of my invention, and the manner in which the same is to be carried out in practice, I wish it to be understood that I do not claim broadly the manufacture of typographic or other blocks by means of photographic plates, nor do I claim the use of a transparent plate with hatched lines in such manufacture; but what I claim, and wish to secure by letters patent is:—The one or more times exerted moving or shifting of the hatched plate on the photographic negative or positive plate during the production of the definite negative or positive from which afterwards the typographic or other printing block is made, as and for the purposes set forth."

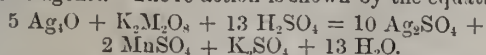
## ON THE LOWEST STAGES OF COMBINATION OF SILVER.

BY DR. W. R. HODGKINSON.

In the *Berichte* of the Berlin Chemical Society of this week (23 July), the third part of a communication by Otto von der Pfordten appears, on the composition of lower oxides of silver. In two previous communications he has shown that compounds of an oxide of silver,  $\text{Ag}_2\text{O}$ , can be obtained by the action of very dilute alkali on a dilute solution of what is practically a silver tartrate, a solution of silver nitrate in sodium or potassium tartrate, and also by the action of phosphorus acid on an ammoniacal solution of silver oxide, such as is obtained by adding dilute ammonia to a silver nitrate solution until it just becomes clear.

The free oxide,  $\text{Ag}_2\text{O}$ , can be obtained, but not easily, from these tartaric or phosphorous acid solutions by an excess of soda, working always with very dilute solutions. The oxide may be dried over sulphuric acid in a vacuum, but not without some decomposition, the product containing varying quantities of oxygen from 1 to 2.5 per cent., the theoretical amount for  $\text{Ag}_2\text{O}$  being 3.58.

This sub-oxide is a deep black amorphous powder, and a characteristic property is, that potassium permanganate and sulphuric acid dissolve it perfectly, forming a salt of ordinary silver oxide. Metallic silver is not affected by these re-agents. The re-action is shown by the equation—



By using a permanganate solution of known strength, and determining the silver dissolved, the relation of Ag to O can be obtained. The freshly prepared oxide is quite insoluble in cold ammonia or acetic acid. Hydrochloric acid converts it into a mixture of silver and silver chloride. No sub-chloride is formed, as the tendency to form ordinary chloride is too great. Sulphurous acid does not dissolve  $\text{Ag}_2\text{O}$ , but reduces it to metallic silver.  $\text{Ag}_2\text{O}$  forms silver sulphite. Peroxide of hydrogen is without action cold; on heating, metallic silver is separated.

After twelve hours' shaking with metallic mercury no alteration either in appearance or in properties was pro-

duced. It is slightly soluble in water, forming a greenish solution. This solution is accompanied by decomposition.

Silver sulphide,  $\text{Ag}_2\text{S}$ , is best made by treating the fresh and moist  $\text{Ag}_2\text{O}$  with sodium hydrogen sulphide, and washing by decantation. It does not keep so well as the oxide under water, but may be washed and dried in a vacuum. In the drying it undergoes a change of colour from deep black to grey, but no loss, as with the oxide.

A large number of reactions show distinctly that this substance is a real compound, and not simply a mixture of silver and silver sulphide.

From these results the existence of subsalts of silver seems to be quite settled. That they are exceedingly unstable compounds was to be expected from the general character of silver compounds. The results should be of interest to photographers, as showing the possibility of subsalts of silver being formed in the sensitive film, and decomposing during the action of development into an ordinary silver salt and metal.

Von der Pfordten has not yet made a sub-chloride from the suboxide direct, but no doubt this will also be soon done, and then we shall see whether we have the same body to deal with as that obtained by the action of light on haloid silver salts.

The idea of photochlorides or physical varieties of silver chloride being formed by the action of light seem to me much too complicated and unchemical to be retained much longer. My own uncompleted experiments have satisfied me that in every case of exposure of silver haloids halogen is split off, and combines with anything that may be present, giving rise to reactions of more or less complexity.

In a perfectly dry condition, probably light has no action on a pure silver haloid, or one only to a small extent, the reduction ceasing after a certain quantity of halogen has been separated. In the presence of water undoubtedly the halogen attacks the hydrogen, liberating oxygen as ozone; whether this precedes or results from the decomposition of hypochlorous acid I am not yet prepared to say. Ozone is formed if the action in contact with water take place vigorously, and at the same time some peroxide of hydrogen is formed. With 80 per cent. alcohol a similar result is obtained—that is, an oxidation to aldehyde—with some unsaturated organic acids, as cinnamic, fumaric, haloid acids are produced. In all these cases an equivalent amount of a subsalt of silver is produced, which, in the case of the chloride, I believe to be  $\text{Ag}_2\text{OCl}_2$ , which, in a moist condition, may also contain some combined water.

As with the oxide and sulphide obtained by Von der Pfordten, these subsalts when in a dry, or nearly dry state, rapidly decompose by light, so that after washing and drying some of the exposed silver chloride in daylight, there is always a quantity of metallic silver mixed with subsalt.

Indeed, this action will go on to a great extent, possibly until nearly all the halogen is eliminated. If some chloride that has been exposed to light in contact with water, or some substance that takes up halogen readily, be washed with concentrated lithium chloride solution and water until most of the  $\text{AgCl}$  is removed, and then dried over sulphuric acid *in vacuo*, be exposed to light, and fresh surfaces continually exposed, as can be done by grinding it in a mortar every day for a week or two, it will be found that nearly all dissolves in nitric acid.

Chloride that has become as dark in colour as it will go by exposure under water or some other medium undergoes further colour changes, on exposure after washing and drying, becoming finally nearly black.

In this action the moisture of the air undoubtedly plays a part, and chlorine escapes probably as hydrochloric acid. This is, however, difficult to prove experimentally.

The darkened subchloride (!) placed on very slightly moistened blue litmus paper turns it red, and after a week or so the paper is bleached. Still, I do not lay much stress on this experiment, as I have only done it once.



As to the question of whether halogen is set free in the case of exposure of a gelatine plate, it does not seem at all likely that any could be set free in such quantity that it could be in any way observed. Supposing such a substance as  $\text{Ag}_2\text{OCl}_2$  to be formed by the action of light on four molecules  $\text{AgCl}$ , the proportion of  $\text{Cl}$  liberated is very small compared to the weight of the original silver haloid molecule, even supposing it to be  $\text{AgCl}$  only; and the small quantity of haloid would be taken up by the gelatine most readily, probably as a compound of  $\text{HCl}$ .

The substance I have partially isolated from exposed silver chloride by the solvent action of lithium chloride on the unaffected chloride is most readily decomposed by ammonia—even cold—into metallic silver and ordinary chloride. Von der Pfordten's sub-oxide is similarly decomposed into silver and a solution of oxide of silver in ammonia on heating or on continued contact.

The uncertainty of the analysis figures obtained by simply igniting the exposed chloride or bromide, even after a careful washing process to extract as much unchanged haloid compound as possible, can be seen from the relative weights of the elements in these probable compounds.

By employing Von der Pfordten's method with permanganate, I hope shortly to get still stronger grounds for the belief in the compounds  $\text{Ag}_2\text{Br}_2\text{O}$  and  $\text{Ag}_2\text{Cl}_2\text{O}$ , as products of the action of light on  $\text{AgBr}$  and  $\text{AgCl}$  in presence of water, and against the unchemical "photo-chlorides."

## LAW FOR PHOTOGRAPHERS.

BY S. J. DEBENHAM.

### CHAPTER IX. (Continued).

#### BUSINESS TRANSACTIONS.

##### *Debtor and Creditor—Enforcement of Claims—Defences.*

THE production of a receipt signed by the creditor is not conclusive evidence of the payment of the money expressed thereby to have been paid. Proof may be admitted to show a mistake was made, or that otherwise there was really no discharge.

I need hardly say that a receipt for £2 or upwards, to be admissible in evidence, must be on a penny stamp (except to refresh the memory of a witness). The stamp should be cancelled by the receipt being written across it, or the initials of the recipient together with the date. Omission to cancel the stamp properly renders the receiver liable to a penalty of 40s.

A debt, however, may be discharged otherwise than by actual payment, *i.e.*, by agreement between the parties for some other mode of settlement, called in law accord and satisfaction.

When the debtor and creditor have agreed that something shall be done by the former in satisfaction of the claim, and this is done as agreed and accepted, the right to sue for the original demand is gone.

An example of this is as follows:—A landlord sued his tenant for money due for use and occupation of premises. The defendant pleaded that the landlord had levied a distress for the rent, and the goods being of adequate value, the plaintiff, instead of selling them, had taken them in satisfaction. This was held a good defence.

It is commonly supposed that the acceptance of a smaller sum than is really due from a debtor in discharge of an amount admitted to be due (called a "liquidated" demand) precludes the creditor from recovering the balance, but it has been over and over again laid down that there can be no payment in full of a debt but payment of the actual amount due. The circumstances under which it was paid, however, may be such that a gift to the debtor of the balance is inferred.

If the creditor take a bill of exchange or promissory note from the debtor for the amount of the claim, he cannot enforce the claim during the currency of the security; this is, in fact, payment. But if the bill be dishonoured, he can sue either for the debt or on the bill.

A release under seal (by deed) is a good defence to the claim, but if not under seal a consideration must be shown to make it available.

If a creditor dies leaving a will by which the debtor is appointed executor, this is by some writers stated to be a release from the debt. This, however, is not the law. The error arises from the fact that the executor is the person clothed with authority to represent the testator, and, amongst other duties, to get in his debts; and of course a man cannot sue himself. But creditors or unpaid legatees can make the executor pay his own debt.

If the amount had been offered or tendered previous to the action being brought, this is a defence. The tender may be made to an agent duly authorised. It must be a tender of the whole sum due, and to avail himself of the plea the debtor must pay the money into Court.

The Statute of Limitations is a bar to any claim to which it can be pleaded. This dates back to the time of James I. The Statute (21 Jas. I. c. 16) enacts "that all actions of account, and upon the case . . . and all actions of debt grounded upon any leuding or contract, without specialty, and all actions of debt for arrears of rent, shall be commenced and sued within six years next after the cause of such action or suit, and not after."

This statute applies to all actions upon written or verbal contracts for the recovery of debts or damages, including Bills of Exchange.

The 7th section of this Act provides that if at the time the cause of action arises, the creditor be "within the age of twenty-one years, *feme covert*, *non compos mentis*, imprisoned, or beyond the seas, such person or persons shall be at liberty to bring the same actions, so as they take the same within such times as are before limited, after their coming to or being of full age, discover, of sane memory, at large, and returned from beyond the seas, as other persons having no such impediment should have done."

By Anne c. 10 s. 19, the fact of defendant being beyond seas at the time the cause of action occurred gave the plaintiff six years after his return to this country.

If a written promise to pay be made, the Statute does not operate until six years thereafter. Formerly a verbal promise was sufficient, but Lord Tenterden's Act 9 Geo. IV. c. 14 enacted that such a promise or acknowledgment must be in writing.

The acknowledgment, if without an express promise, must be unequivocal and unqualified, so that a promise to pay may be inferred. For example, the following letters were held not sufficient to take the cases out of the statute:—

"I have to request you will be pleased to send me in any bill, or what demand you have to make on me, and, if just, I shall not give you the trouble of going to law."

Letter written to a clerk of the plaintiff:—"I will not fail to meet on fair terms, and have now a hope that before, perhaps, a week from this date I shall have it in my power to pay him, at all events, a portion of the debt, when we shall settle about the liquidation of the balance."

The signature of the acknowledgment will be sufficient if it be that of an agent of the party to be charged (the debtor) duly authorised to make such acknowledgment.

Payment of part of the claim is sufficient to take the case out of the statute if made under circumstances which infer a promise to pay the balance, and the onus will be on the defendant to show the contrary of this.

The reason part payment was allowed to over-ride the statute was that it was evidence of a fresh promise, and the Act of Geo. III. provides that nothing therein contained shall alter, take away, or lessen the effect of any payment of any principal or interest. The payment need not be in money if parties agree that goods shall be supplied in part payment of a debt, and goods are supplied and received accordingly; this will amount to a part payment, and will bar the operation of the statute. And where there are accounts on both sides, and the parties go through them and strike a balance in favour of the creditor, this con-



nects the debtor's claim thus allowed into a set-off, which is equivalent to a payment, and takes the case out of the statute.

Of course a defendant may set-off any debt due from the plaintiff to him against the claim of the latter, and by the Judicature Acts he can also raise the defence of a counter-claim, which is not the same thing, though similar, and the distinction need not here be fully explained. One difference, however, is that a defendant may set-off as counter-claim a claim for damages, which he could not set-off strictly speaking; e.g., in a case recently reported, where a card-maker sued for the price of mounts, and the defendant counter-claimed for damage alleged to have been caused to his photographs by the injurious material used in them.

To be available, the defendant's claim by way of set-off must be thoroughly sound, and such as he could maintain if brought forward in an independent action. It must have been due at the commencement of the plaintiff's action.

But if partners sue for a debt due to the firm, the defendant cannot set off a debt due from one of them only; nor can one of several defendants set-off a debt due to him alone from the plaintiff.

Infancy is a defence which is almost fatal to a photographer's claim, inasmuch as a person who was under age at the time the debt was contracted can only be made liable for necessities. Not that the term "necessaries" is absolutely confined to such matters only as are absolutely essential to his personal subsistence or support. It is used to describe articles purchased for real use, and which are not merely ornamental.

But I will use the word "minor" as infant, though the English legal description (not the Irish, by the way) does seem absurd when speaking of an individual, perhaps, six feet high.

A minor being a captain in the army, it was held that liveries for his servant were necessities, but not cockades, which he had ordered for some of the soldiers. Uniform, as a Volunteer's, was held a necessary, but not a chronometer, though the minor was a lieutenant in the army. Perhaps this was because the price was £68.

Much depends on the minor's rank in life. It is the province of a jury to decide what are necessities. Most questions of this description have arisen in the cases of undergraduates at the Universities, and the inclination of juries has been to comprise as many things as possible in the list of necessities. Articles of mere luxury cannot, however, be necessities, and I am inclined to think photographs would come under this description.

Where a minor is sued for the price of goods supplied to him on credit, he may, for the purpose of showing that they were not necessities, give evidence that when the order was given he was already sufficiently supplied with goods of a similar description, and it is immaterial whether the plaintiff did or did not know of the existing supply.

(*Barnes v. Toye*, 13 Q.B.D. 410, decided in the Divisional Court on motions for a new trial.) In this case Mr. Justice Field said, "Looking at the position in life of the defendant, there is nothing to show that the goods supplied were not of the class of necessities; but the defendant says the contract is one which does not bind him, because he was already supplied with goods of the same class. (The claim was for a tailor's bill.) In summing up, the judge had told the jury they were not to take this into account. . . . The law is that an infant is not permitted to bind himself by contract, but to this there are exceptions. . . . In more modern times the rule is expressed generally that an infant may contract for the supply of necessities suitable to his condition in life. . . . I am of opinion that the question should have been left to the jury whether these goods were necessities, taking into consideration not merely the character of the goods, but the question whether the defendant was in possession of such

a supply of goods of the same description that he was not in want of these. There must be a new trial."

In the County Courts the judge is also the jury (unless a jury be sworn), and as I have mentioned, half the Queen's Bench cases are now tried without juries.

I have already shown that married women are by their marriage (called in law coverture) exempted from liability on contracts, except in respect of separate estate.

The most modern case is *Scott v. Morley*, 20, Q. B. Division, 120, where the form of the judgment now always adopted in judgment against married women is as follows:—"It is ordered that the plaintiff do recover (the amount due), and costs against the defendant, such sum and costs to be payable out of her separate property as hereinafter mentioned, and not otherwise. And it is ordered that execution hereon be limited to the separate property of the defendant (the married woman) not subject to any restriction against anticipation, unless by reason of s. 19 of the Married Women's Property Act, 1882, the property shall be liable to exemption notwithstanding such restriction."

The popular idea is that a husband is *prima facie* liable for the debts of his wife, and until lately this was the law as to necessities supplied to her. As pointed out above, this word is not confined to the essentials of existence.

The Chief Justice recently laid it down broadly, that the husband is not *prima facie* liable for the debts of a married woman, inasmuch as now the marriage raises no presumption of agency. But I venture to express a little doubt upon this point, and do not think that a long series of decisions under which the law has been settled for years is likely to be persistently and permanently overruled. However, for the present the law must be considered settled by the judgment in *Debenham v. Mellor* given below.

In *Debenham v. Mellor*, decided in the House of Lords on appeal, the judgment is to the following effect:—

Where the husband neither does, nor assents to, any act to show that he has held out his wife as his agent, to pledge his credit for goods supplied on her order, the question whether she bears that character must be examined upon the circumstances of the case.

That question is one of fact. The management of the husband's house would raise a presumption of agency as to matters necessarily connected with that arrangement, which ought not to be got rid of by a mere private arrangement between husband and wife. Otherwise, where such management did not exist. The defendant was the manager of a limited company's hotel at Bradford, where his wife acted as manageress. They cohabited, and he made his wife an allowance for clothes, but forbade her to pledge his credit for them. She purchased clothes in London, the bills for which were at first made out in his name, and were paid by her. She afterwards incurred with the same firm a debt for clothes, and they demanded payment from the husband, with whom they had previously no communication. It was held (affirming the judgment of the court below) that the husband was not liable; that, under the circumstances, the mere fact of cohabitation did not raise a presumption of agency, nor require him to prove a notice not to trust his wife.

## THROUGH JAPAN WITH A CAMERA.

BY W. K. BURTON.

### CHAPTER IV.

HAKODATTE (*continued*)—TEA HOUSES—THE BATH.

I MADE several exposures of scenes in Hakodate, but do not consider that the results are of sufficient interest to be worth sending to England. One day of my sojourn in Hakodate—after business was over—was devoted to photographing the citizens who had been so hospitable to us during our stay in the town. They appeared to enjoy the performance heartily, and afterwards took us round to



a "tea house," and there entertained us in Japanese style. I shall take occasion before long to describe very fully a Japanese feast; in the meantime, something must be said of the "tea-houses," which are a very great feature in Japanese life.

The tea-house in Japan may be said to take the place of the restaurant, the coffee-house, the public-house, the tavern, and, to a great extent, the club in England.

Tea-houses are of all sorts and conditions, from miserable, poky little houses by a country road side, used merely for the hasty refreshment of the passing traveller, to large and handsome houses, with a number of spacious rooms, in which parties of Japanese take their relaxation.

The tea-houses are used on all sorts of occasions. Do two friends meet and wish to have a few words of talk?—to the nearest tea-house. Is a piece of business to be done?—it is the same. If a friend is to be entertained, it is commonly done at a tea-house. Does a Japanese wish a rest in the middle of the day, he hies him to the nearest tea-house, and there lies down, and goes promptly to sleep. If a number of young men wish to have a merry evening, it is generally to a tea-house they go; and, if they want music, they call in *Gaisha* (professional singers), of whom more hereafter.

The roadside tea-house may be said to be rather a resting-place than anything else. When a traveller stops at such a house, he is immediately handed the never-failing cup of tea, and generally a dish of sweet cakes is put down beside him.

Generally some more solid food can be had if asked for, and always *saké*, the wine of the country.

For the tea, &c., offered as a matter of course, there is no fixed charge. The guest pays what he thinks fit; and it is an understood thing that the payment does not so much bear a relation to the quality or quantity of the fare as to the wealth of the guest. Thus a rich man, travelling, may pay as much as 1*d.*, or even 1½*d.*; a man of moderate means will pay perhaps ½*d.*; whilst the coolie class appear to pay nothing at all, yet always to be welcome at this wayside tea-house.

From a tea-house of the kind described, to those near the larger towns, which are fashionable places of resort, there is every gradation.

The larger tea-houses around the towns are, so far as I know them, used as places of amusement and relaxation only. At all of them the "tea-house girl" is a great institution. She waits on the guests; but the "waiting" means a great deal more than it does at home. It is her duty to entertain them, as well as merely to bring what they require in the way of food and drink. She is full of innocent fun and of infinite and endless good nature—of fun which appears to rise spontaneously from a happy mind and of good nature—which nothing appears to ruffle.

The bath is an institution which, in Japan, is considered of much more importance than at home. The Japanese are continually bathing in exceedingly hot water. I have already mentioned the public baths. These, except when medicinal, are used only by those who cannot afford to have baths in their own houses. Every one who can afford it has a bath in his house—or near his house. It is not at all an uncommon thing for the bath to be at some distance from the building, and to see the various members of the family coming out of the house of an afternoon in nature's garb to take their turns and have a dip. The bath in a private house is like a large oval shaped tub. A vertical copper tube, some five inches in diameter, passes through the water at one end. In this tube charcoal is burned till the water is raised to the desired heat, which is, with the Japanese, very high.

Foreigners, as a rule, cannot at first stand the great heat; but they very soon come to like it, going into water which at first feels scaldingly hot; and certainly the dip into the hot water is surprisingly refreshing, and, strange to say, is especially so in very hot weather. It must be a

mere dip, never lasting more than about five minutes. This may be repeated several times a day.

In every hotel and tea-house there is a bath for the use of guests, which may vary in size from a small affair such as I have described as common in private houses—a deep tub, just large enough to sit down in—to a great, deep wooden tank almost large enough to swim in.

On arriving at a hotel or at a tea house to stay any length of time, it is customary at once to have a bath. If one is in European dress, a *ukata*, or bath dress is provided. This is simply the ordinary Japanese garment, consisting of a robe something like a dressing-gown open all down the front, and kept from remaining quite open by a sash tied round the waist.

The amount of privacy—or rather absence of privacy—of the baths varies with the place. Many of the bath rooms are about as public as would be a front shop window in the Strand. Further, at the tea-houses, one of the female attendants often considers it her duty to remain in the bath room to attend to the bather's wants; any attempt to try to make her understand that foreigners are so foolish as to consider this attention indelicate would result in complete failure. All this is very embarrassing to foreigners at first, but most of them get quickly accustomed to it.

The idea of a cold bath appears to be quite foreign to the Japanese, and my request that I be allowed to go into the bath before the charcoal fire was lighted was, I think, looked on as a symptom of mild insanity.

#### NOTES FROM NEW YORK.

PHOTOGRAPHIC matters in and about New York during this summer are very quiet; the issue of two new books, one entitled "The Photographer's Book of Practical Formulae," compiled by W. D. Holmes and E. P. Griswold, and "Anthony's International Almanac," being perhaps the chief items of interest.

I am informed that the electric incandescent light is soon to be introduced into the New York Amateur Society's dark room, which will undoubtedly add to the comfort of working. The Society, for the convenience of its members, keeps on hand a stock of different brands of plates, which has been found particularly useful for those who make outings on Sunday or holidays. When the shops are closed, plates can always be had at the Society. Having a professional printer in attendance, ready to assist members in the developing of plates, mixing toning baths, and doing printing at odd times, has been found to be particularly useful.

The American Slide Interchange has completed its organization, and embraces seven societies. The executive committee elected to conduct its affairs consists of George Bullock, of Cincinnati, Ohio; Edmund Stirling, of Philadelphia, Pa.; and F. C. Beach, of New York. The committee has issued a form for use of each Society, wherein members are urged to give as much information about the subjects or special processes used in the making of slides as possible. It is ruled somewhat as follows:—

Subject, Location, &c.	Maker of Negative.	Maker of Slide.	Developer.	Lantern Slide Plate	Miscellaneous Information about Subjects or Special Processes used in making Slides.
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When a lantern exhibition occurs, these lists of information become useful in informing the audience about points of interest. The duty of the committee is to select from the slides submitted by the different Societies only those of merit, which will then go the rounds of the interchange for exhibition purposes. If the committee uses proper judgment there is no doubt but what the quality of lantern exhibitions will be much improved.

From Mr. Beach we learn that he is engaged in experimenting on a new combination developer, which, as far as his experiments go, answers admirably for instantaneous



time exposures, and for transparencies and lantern slides. It is mixed in concentrated form, and should be kept in the dark or in a yellow glass bottle. The formula is as follows :—

No. 1.—Pyrogallol	...	...	172 grains
Hydroxylamine	...	...	20 "
Hydrochinon	...	...	80 "
Sulphurous acid	...	...	2 ounces
Distilled water	...	...	2 "
No. 2.—Carbonate of potash (C.P.)	...	...	3 ounces
Water	...	...	8 "

To develop an instantaneous exposure, half a dram of No. 1 and No. 2 are put into a graduate, with water to two ounces. The development proceeds rapidly, yet gradually, like pyro, with the additional advantage that there is absolute freedom from fogging of the film by the prolonged action of the developer. Also, the developer itself keeps remarkably clear, scarcely changing its colour after a long time. The No. 1 solution is light yellow coloured by reflected light, and greenish yellow by transmitted light. The colour of the negative is a brown black, beautifully clear in the shadows. It will be observed that sulphite of soda is not employed, Mr. Beach finding that the sulphurous acid has a similar effect, without in any way slowing the action of the developer.

During this summer a new detective camera, called "Ford's Tom Thumb Camera," has been introduced, taking pictures  $2\frac{3}{4}$  inches square, sharp beyond a distance of eight feet. The subjoined cut gives an idea of its construction. Fig. 1 shows the camera when removed from

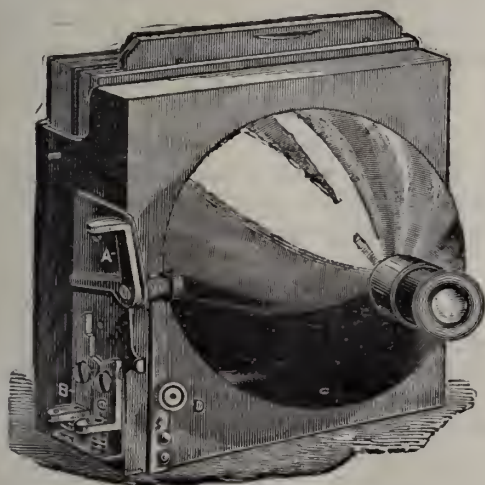


Fig. 1.

the box. It is stamped out from thin metal, neatly nickel plated, and is furnished with a Gray periscope lens, similar to that used in the concealed camera. The shutter is in the form of a hemisphere, rotating just behind the hemispherical or globular front. Its axis projects out at one side, and ends in a right-angled crank, A, the lower arm of which engages with triggers B and C. The actuating spring is on the axis, and the speed of the shutter is regulated by the flat friction spring operated by the thumbscrew, D. The upper arm, A, is pushed down with finger which sets the shutter, locking the lower arm in front of trigger, C. If an instantaneous exposure is desired, the trigger B is pressed down, which carries with it trigger C. A time exposure is made by pressing down trigger C. The arm then strikes B, and is intercepted. Pressing down B allows the shutter to close small springs under the triggers, and keep them pressed up in place.

Fig 2 shows the camera enclosed in a neat black walnut box with a hinged cover, and an aperture on the side for operating the shutter. It holds three plate-holders. A

sliding bottom is provided which allows the camera to be readily removed, and here is room for two extra plate-holders. These are made in book form, and are very simple. The intention of the inventor was to get up a

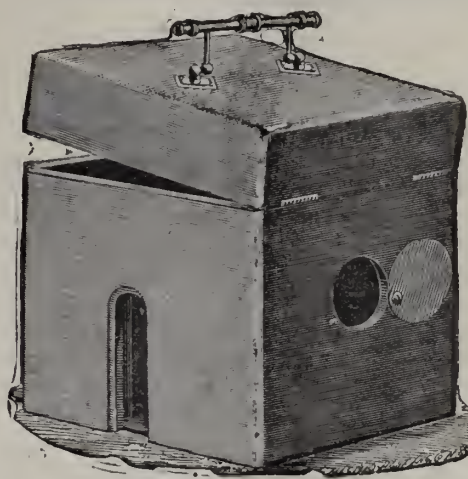


Fig. 2.

machine at low cost which would take a picture somewhat larger than the well-known "concealed or vest camera." A special blackened brass plate having a circular opening, is set in the back of the camera when circular pictures are desired. It is removable at pleasure. The box is about five inches long by four wide, and six inches deep. Very good lantern slide negatives may be made with it, which are also well adapted for enlarging purposes. I send one or two bromide prints, from negatives made with this apparatus. He sells it at the low cost of £2.

The Minneapolis Convention of American Photographers was a failure so far as photographic results are concerned. Many of the prominent photographers did not attend. Judging from reports from reliable sources, Mr. Geo. G. Rockwood, of N.Y., exhibited the simplest and best apparatus for obtaining magnesium light pictures. The first fall meeting of the New York Amateur Society occurs on Sept. 11. Mr. Ives, of Philadelphia, is expected to demonstrate his new orthochromatic process. Several American amateurs are travelling abroad, doubtless taking in the fine English scenery, so well adapted for the camera.

Our new addition to current literature is "The Science of Photography," illustrated and published monthly at Philadelphia. Its art department is especially rich in valuable suggestions, and it is otherwise neatly gotten up. So far its date of issue and publication has been rather irregular, doubtless due to the newness of the management to the publication business.

Another novelty in the photographic line is the new "Kodak" detective camera just introduced by the Eastman Dry Plate and Film Co. It weighs less than two pounds, and contains enough bromide paper to make a hundred pictures about  $2\frac{3}{4}$  inches in diameter, suitable for enlarging or lantern slides. The lens is wide angle, taking objects three feet distant, and beyond, sharp. A continuous cylindrical shutter is provided, operated by simple yet ingenious mechanism.

A new feature is the fact that the company will undertake to develop the hundred exposures, print positive albumen prints mounted and burnished, and supply in addition a fresh spool for a hundred more exposures, for \$10, or equal to £2. A neatly printed book for recording exposures is provided, and a special manual telling just what to do accompanies it. Any one knowing nothing whatever about photography can use it, and readily obtain good pictures. The plan seems to be devised to pro-



mote a large business for the company, and is based, as they claim, on a division of labour. The buyer makes the exposures, and they finish the pictures. A hundred negatives and positive prints are thus made for \$10.

New York, August 4th.

SULPHITE.

### Notes.

Attentive readers will know how often the camera gun in its various forms has been described in the PHOTOGRAPHIC NEWS and in the YEAR-BOOK, and in one of our recent reports of the London and Provincial Photographic Society, it is incidentally mentioned that "J. White exhibited a camera for photographing birds on the wing. It was mounted at the end of a gun stock, the trigger releasing the shutter. When pressed close to the shoulder in taking aim, the apparatus could be held quite steady." With reference to the matter, J. Lendon Berry, of Cardiff Street, Aberdare, writes:—"I wish particularly to draw attention to the fact, that mounting any ordinary camera at the end of a gun stock, with a trigger that actuates any pneumatic shutter that might be used, forms the subject of a patent applied for by myself, and such application was accepted as 'improvements in or connected with photographic cameras,' No. 3779, dated 12th March, 1888. I enclose a few prints made from negatives taken with it, also photographs of the gun by itself, and with an ordinary camera mounted on it, with full printed description of the same."

Mr. Berry's photographs are very excellent from the special point of view which should be taken in criticising photographs of the "snap-shot" class. The views are mostly street scenes, and they are sharp, well exposed, taken from a convenient height, nicely adjusted on the plate, and, what is more, they give no indication of the reality of the scenes having been interfered with by diversion of attention to the photographer and his doings. Indeed, from what we see, we are inclined to think that the gun camera, if totally divested of a gun-like appearance—and an ordinary camera on a gun stock is not like enough to a gun to frighten any reasonable person—may have real advantages as regards accuracy, quickness, and steadiness of aim.

With regard to Mr. Berry's patent claims, we need say nothing, excepting to remind him that the mere "acceptance" of an application does not imply that the department guarantees the originality of the invention, and it gives an applicant no claim in the face of prior publication. Still, putting all this aside, many readers will be glad to know that Mr. Berry makes and sells, at a very low price, a gun stock and trigger arrangement, to which any ordinary camera can be conveniently attached; the trigger acting on the pneumatic ball by an ingenious device, which in itself is, we imagine, quite patentable.

A circular, enclosed by our above-mentioned correspondent, J. L. Berry, gives a description of an ingeniously devised combination tripod-head and clamp, which seems

likely to serve the tourist well. One of the arms of the tripod-head is elongated, so as to take a clamping screw, adapting the arrangement for fixing to the edge of boat, fence, post, or railway carriage window.

The true craftsman is often almost lost to sight in the whirl and strain of competitive commercialism—a thing often exemplified by the fact that clever and ingenious arrangements by workers in outlying districts often come to our notice but casually, while those articles upon which the commercialist has fixed as engines to bring profit to himself are constantly forced upon the attention of ourselves and others, with all the meretricious fantasy of strange types and eccentric arrangements by the printer.

The "Arts and Crafts" Exhibition, which is to be held at the New Art Gallery, Regent Street, during October and November of this year, is, we take it, intended to foster that craftsmanship in which the worker takes pleasure, and in which the worker is something more than a machine. The circular of the "Arts and Crafts Exhibition Society" sets forth the following sections into which the exhibition is to be divided, each section in the catalogue to be prefaced by a short article by a master in the particular craft concerned. Textiles: Gold and silversmith's work, including enamelling, metal and iron work, fictiles, decorative painting, wall papers, book-binding, printing, glass, stained glass, wood and stone carving, cabinet making, and design modelling.

At first, the committee will undoubtedly have much difficulty in knowing what to allow or what to exclude: photography, for example, might come in under printing; for what is it but printing with nature as a type or mould?

The "Arts and Crafts" Exhibition is a thing which, perhaps, cannot properly form itself finally for years, but it has the advantage of the active support of many who are known to work hard and successfully in the cause of industrial art, a thing which will be obvious when we mention the following as on the committee:—W. A. S. Benson, Walter Crane, Lewis F. Day, E. Burne Jones, William de Morgan, William Morris, Emery Walker, Thomas Wardle (Leek), Stephen Webb, H. J. N. Westlake. The secretary is Ernest Radford, The New Gallery, 121, Regent Street, W. The Society of Arts has guaranteed £50 towards the expenses.

A correspondent of the *Standard* has been puzzling over the reason why some of the photographs of lightning in the possession of the Royal Meteorological Society exhibit a ribbon-like structure, while the appearance is totally absent from others. Thinking that the effect may be due to taking the photograph of the lightning flash through a window, he has been trying to produce the same result by interposing a sheet of window glass between a brightly illuminated slit of the camera. "So far as these experiments have yet gone," the *Standard* gravely states, "he is not in a position to assert that all the peculiar



band-like appearances can thus be imitated, but there is no doubt, he asserts, that a photograph of an unribboned flash, taken obliquely through a window, must exhibit appearances very similar, if not identical." It would be hard to find a more delightful specimen of the *non sequitur* than this. In the first place, the experimenter has not succeeded in producing the ribbon markings which puzzle him; and if he had, would he seriously contend that photographing a brightly illuminated slit is at all analogous to photographing a flash of lightning?

Photography has proved a boon and a blessing to the bachelors of Dutch India. The young men there are so eager to be married that they write to their friends in Holland to find them wives. The friend selects the willing lady, conforming to the suggestions in the letter, a photograph of the chosen one is enclosed in the reply, and after a lapse of a few months a soiled left-hand glove, with a power of attorney, is received from the far-away bachelor. We are not told whether it is stipulated that the photographs must be untouched, so that the bachelor may see the lady who wishes to become his wife without the factitious charm which the retoucher's pencil imparts, but we should scarcely think he would be so ungallant. At the same time, he would be well advised if he laid down the condition that the lady should have a photograph taken specially for him. It is a singular fact that a lady, say of thirty years of age, has an idea that she is represented quite truthfully by the photograph which was taken of her when she was five-and-twenty.

A French doctor has recently published a curious synopsis of the recent Criminal Anthropological Congress. He has discovered that, contrary to what is often believed, the criminal, as a rule, has not a ferocious countenance, and the more hardened he is, the softer the expression of the face, and the finer the traits. Abnormal development of the jaws, absence of beard, abundance of hair, and a lapping ear, are also evidences of moral obliquity. The portraits of criminals exhibited by S. G. Paype at the last photographic exhibition ought to be valuable evidence on this point. Speaking from recollection, there were certainly some of the faces which were well-favoured, but the majority were ill-looking, and of a low type of intelligence. But probably these were criminals of small ambition, and imprisoned for such trifles as petty larceny, misdemeanour, burglary, &c. The criminal type referred to by the French doctor refers to such notoriety as Lacenaire, Pel, Fenayron, and other first-class murderers.

The delays of the law are peculiarly exemplified in the case of *Downes v. Fallowfield*, which has from time to time been reported in these pages. The trial was on the list in the beginning of last October, and after the usual attendances day after day of plaintiff, defendant, and a host of witnesses, with no result but waste of time and money for about a fortnight, it finally came on for hearing. Mr. Justice Manisty devoted about two hours to the case, and finding it hopelessly unintelligible from its technicalities, referred it to a scientific expert. It was more than six

months before the expert made his report, and when he did so, and the case again came on, the judge flatly refused to adjudicate on the question of damages, observing that the plaintiff and defendant must arrange between themselves, or the question must again be referred. Weeks went over, and ultimately a notice appeared in the list of Friday week that *Downes v. Fallowfield* would be "mentioned." Some of the public interested in the case attended the Court and waited in vain for the "mention." It then came out that the reference got into the list by mistake, but that had the counsel on either side been present, the case would have been "mentioned;" but these gentlemen were far away in the country, and so this matter again stands over until after the vacation. We do not know that anybody was to blame for the delay, nor could we say whether it could have been avoided, but this is no consolation to the plaintiff.

## CHAPTERS IN ELEMENTARY PHOTOGRAPHY— A GUIDE TO BEGINNERS.

BY W. M. ASHMAN.

SEVENTH ARTICLE.

*The Rectilinear Lens.*—Rectilinear lenses are of the doublet type—that is, an objective comprising two combinations instead of one, like that which we described in the previous chapter. These doublet lenses differ somewhat in curves, density, and the distance at which the cemented combinations are removed from each other. Opticians are then enabled to provide photographers with a variety of lenses, differing very little in outward form, but which, nevertheless, are possessed of special characteristics offering advantages not found in other instruments. Thus we find in opticians' catalogues lenses termed ordinary, and rapid doublets, rapid rectilinear, rapid symmetrical, rapid euroscope, &c., all of which are constructed to give the vertical lines of a building or buildings free from this distortion, whether called rectilinear or otherwise, and the perspective is generally satisfactory. "Wide angle" doublets, rectilinears, &c., some of which will embrace an angle of nearly 100°, are apt to show some curvature at the margins, and perspective is also defective, near objects being magnified, and distant objects diminished, out of due proportion. Such lenses are, however, invaluable to photographers, notwithstanding any defects of this kind, especially for the purpose of portraying flat surfaces embracing a very wide angle—or, in other words, photographing in confined situations—as, for example, the front of a building situated in a narrow street. In what respects do the lenses of large and small angle differ? says R. Morrison, the celebrated American optician.—"Wilson's Quarter Century in Photography":—

"If you have a tube of one inch diameter and one inch long, it would be a square, or have an angle of 90°; and if a lens were placed in it it would show a picture of all objects in front of it that were included in a line drawn diagonally from the back to the front of the tube, and continued to the horizon. The same lines drawn towards the ground glass will show the size of the illuminated circle at the focus of the lens. To illustrate, suppose there were ninety posts or trees, placed at equal distances apart; if you place a lens, with an angle of 90°, at such a distance from them that they will exactly cover the circle, and then place another lens of 45°, but of the same focus, only forty-five trees will be seen, but each tree will be exactly alike in size. In this case each tree would occupy the space of one degree, and if the lens was placed at half the distance, it would take the space of two degrees, and only half the number would be shown, but each tree would be twice the size."

The foregoing extract will show that there is a fixed relationship between the angle of a lens and the size of



the plate it will cover. The size of each object taken from the same standpoint being determined by the focus, and not the diameter. Neither the angle or focus of a lens is directly influenced by the diameter, as any lens will give any angle if mounted in a suitable tube. "Wide-angle lenses are less rapid than those of smaller angles, principally on account of the limited diaphragm-aperture allowable. All lenses of rectilinear type are composed of two actinic or achromatic combinations of the same size, made up of flint and crown glass, differing more or less in

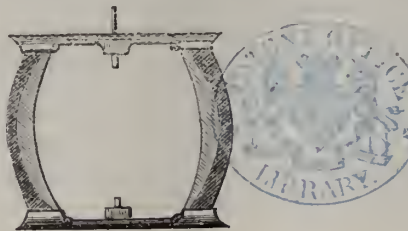


Fig. 17.

curvature, but when mounted in position present a concavo-convex surface at each end of the tube, the convex surface being outward, as shown in fig. 17.

Near the middle of the tube provision is made for the insertion of Waterhouse diaphragms, except where the Iris diaphragm method has been adopted. Although stops are provided for the purpose of diminishing the illumination, and at the same time increasing the crispness of the marginal lines—as, for instance, in copying a map, plan, or any other object near at hand, the dimensions of which indicate the use of a white angle lens. Yet under ordinary circumstances no diaphragm beyond that of the stop plate is absolutely necessary, especially with aplanatic lenses, as many of the modern instruments are called, the term signifying that a sufficiently well defined image for practical purposes can be obtained without the use of a diaphragm. The large aperture thus available renders a lens of this class an extremely valuable instrument for instantaneous work, photographing badly-lighted interiors, which latter always require a prolonged exposure, and for portraiture in or out of doors. A character for general proficiency has been won for the rectilinear doublet, and it is unquestionably the most useful lens one can possess. Let us suppose that as a doublet such a lens will give an image in focus at eight inches from the posterior lens to ground glass screen. This would be termed eight inches back focus. Then, if we remove the front combination and withdraw the ground glass to sixteen inches, an image double the previous size will result, and, theoretically, the time necessary to expose in the camera would be fourfold; but for reasons given in the last chapter antediminishing the working aperture, a more prolonged exposure becomes necessary. In addition, rectilinearity suffers, and if the subject be high buildings near at hand, they will appear distorted; but when employed as an ordinary landscape lens, it acts as perfectly as any other. It is, however, essential that when used in this way a small diaphragm should be inserted in the slot previous to focussing, and in front of the single combination provided the distance is suitable. When the stop or diaphragm is situated too close to the lens the working aperture is thereby diminished, and the field of view is limited in consequence; besides which the image would be indistinct at the edges, from what is known as curvature of image.

To avoid the defect curvature of field, which is characteristic of single lenses, the stop is placed at such distance that the divergent rays which enter shall reach the margin of the combination (now an actinic meniscus), and in passing become sufficiently lengthened to produce a flat field, and thereby correct the error which is only in some measure performed by the lens alone. A stop placed too

far in front of a single lens is liable to produce what is known as a flare spot, namely a disc of light fog about the same dimensions as the aperture of the diaphragm, and really an image thereof. The remedy is obvious.

The portrait combination is of doublet type, but differs from those we have been considering in many respects. A portrait lens has a front combination cemented, which presents a plano-convex surface, convexity being nearest to the object photographed. The back combination (uncemented) presents a bi-convex surface. The curves are so arranged that the aberration of one lens is corrected by that of the other; a compromise being thus effected, a tolerably distinct image can be obtained at a moderate focal distance with the full diameter of the lens. As these lenses are designed chiefly for rapidity of exposure, objects situated at different planes cannot with full aperture be rendered sufficiently distinct in the camera. Some will appear in focus, while others will be fuzzy; hence the necessity of using a stop to lengthen refracted rays, and so sharpen the focus. Mr. Waterhouse, whose name has been mentioned in connection with diaphragms, recommended sliding stops being placed in the tube midway between the combinations of a portrait lens, and the advice has been universally accepted. The use of diaphragms will be more fully treated in the next chapter.

#### A TRIP TO THE CHANNEL ISLANDS.

BY LOCKE MACDONA, B.A.

"WHERE shall I spend my holiday?" The reply to this question at any period during the last month (July) might have been, "It doesn't much matter where, so long as you provide yourself with a couple of stout mackintoshes, one for actual use while the other is drying." Armed, then, with this indispensable article, a minimum of luggage, a  $7\frac{1}{2}$  by 5 camera, and four dozen plates, I steamed out of Paddington at 3 p.m. one afternoon with a light heart under my waistcoat, and a return ticket to the Channel Islands in my pocket. I reached Weymouth about 9 o'clock, and transferring my impedimenta to the top of an omnibus in waiting at the aforesaid terminus, I found myself in a few minutes at the quay, and after depositing my luggage in the saloon of the diminutive little *Cygnus* strolled into the town to prepare myself for the sea journey by taking on board a substantial supper.

The steam whistle gives forth its hoarse warning that it is 11.15 p.m., and after the usual rattle of chains and coiling of cables, we steam out of the harbour, a fresh breeze and drifting angry-looking clouds presaging a dirty night; and so it turned out. Though a good sailor, the woeful cries of souls in agony, and the clatter of china in a not too well ventilated saloon, gained the day, and I, too, succumbed to the general malady.

But we are now entering the pretty harbour of Guernsey, and after a refreshing cup of coffee on the quay, and about half an hour's delay for unloading, we steam out once more for our destination, St. Heliers, the capital of Jersey. About 11 a.m. we slowly steam past the crowd of sightseers on the pier, and enter the harbour. There is just enough water to float us, and we have to disembark into small boats at a charge of 3d. a head. A plentiful assortment of omnibuses stand ready to convey passengers to the various hotels. The one recommended to me by a friend in the town was the "Bristol," an unpretending little hostelry facing the explanade and bay, and both my two friends who joined me two or three days later and I myself have reason to thank our stars for being sent to such a comfortable house. For the modest sum of 6s. a day we were fed like the proverbial fighting cock; and when our jaded limbs sought repose, we were allotted the most delightful little bedrooms, exquisitely clean and comfortable, with a charming look out on the bay. Our landlord, his wife, and Kate (who waited on us) were most attentive in every way, and we were quite sorry when the time came to leave



the snug little hostelry. I myself arrived four days before my two travelling companions, both of whom were ardent disciples of the camera. One was a 'Varsity man fresh from "Alma Mater," whom I will call Oxoniensis, or for shortness O. The other was a distinguished amateur, who has landed many a medal in his day, and whom I will call Jingle. My heart rejoiced greatly when, on the Sunday morning, I had the satisfaction of beholding them drawing up alongside the quay, and after the usual congratulations I escorted them to the "Bristol," where they did ample justice to a substantial breakfast of eggs and bacon.

As the day was dull we could not do much with the camera; however, O. and myself took a plate or two into the town, determined to have a smack at something. A public-house was the first thing that arrested our attention. Smile not, gentle reader; those who have visited the National Gallery may have seen Copley's spirited painting of the death of Major Pierson, while defending the town of St. Heliers against the French. This picture is a faithful representation of the spot, and O. and myself, bursting with patriotic zeal, unlimbered our cameras and "went for" the historic subject. On one side of the door of this historic "public" is painted the tragic announcement, "Here Pierson fell," and on the other the somewhat prosaic legend, "Guinness's stout, on draught and in bottle."

Next morning we were up at a very early hour, as Jingle, who is a photographic epicure, and who had sneered at our enthusiastic efforts to immortalise Major Pierson on the previous afternoon, suggested that we should take the steamer to St. Malo, and work our way to the picturesque town of Dinan and do something creditable. So, after a hasty cup of coffee at our hotel, we rushed off with our cameras and a supply of ammunition to the steamer, which started for St. Malo at 8 a.m. After a pleasant sail of about three hours we entered the strongly fortified port and harbour of St. Malo.

Our natural enemies, the Customs, were waiting for us on the Quay. Jingle, who is an old hand at the business, with an airy and non-chalant waive of the hand, got through successfully; but O., much to his disgust, was compelled to open up a plate-box; but fortunately there were but two plates in it, these, of course, being spoiled. We made our way to the Franklin Hotel, that our host at the "Bristol" had recommended, and we did full justice to a *déjeuner à la fourchette*, which we just arrived in time for. We were well satisfied with this hotel; the charges were reasonable (about 12 francs a day). After we had finished our breakfast we sallied out into the town to "prospect." Jingle warned us to be careful how we pointed our cameras at any of the fortifications, instancing the case of one of his friends who was treated to a gratuitous course of bread and water for this indiscretion. So we considered it best to be on the safe side, and forthwith made for the official abode of M. le Commissaire de Police, and stated that we were English tourists, desirous of taking some views. He graciously granted us the required permission, and we returned to the "Franklin" for our things. There is plenty to do at St. Malo in the way of shipping. We got several very good things, notwithstanding the bad weather, for the rain poured down steadily for at least two hours, during which time we confined ourselves to the smoking room, and either read the papers or went to sleep. About 5 p.m. a burst of sunshine caused us to make a bolt for our cameras, and rapidly unlimber, and in about ten minutes we each of us had secured some good views of the harbour.

As it was now close on dinner time we repaired to the "Franklin" and sat down to an excellent *table d'hôte*. After dinner we sallied forth in search of amusement, and were directed to the Casino, where, after paying two francs each for admission, we entered a room, at one end of which was a table, over which presided a gentleman who invited us to place the coin of the realm on certain squares marked out on the aforesaid table, which having done, a number of diminutive toy racehorses were set in motion; but

as they failed to stop at the particular spot that we preferred, we felt for our return tickets, buttoned up our coats, and made our way back to the "Franklin" and turned in. Next morning we held a consultation, and decided to return by the morning boat to Jersey, as the weather looked so uncertain, precluding much photographic success at Dinan, where we had intended to go.

Three hours' pleasant sail landed us once more at St. Heliers, and we were fortunate now in securing some fine views of the harbour and shipping, the sun once more favouring us with his welcome presence. After lunch we determined to set out and try our luck at St. Aubins, a prettily situated suburb of St. Heliers. We took the train from Cheapside Station, within a stone's throw of our hotel, and in about fifteen minutes the toy railway, after skirting the bay, landed us at St. Aubins, a pretty terminus boasting of a fountain surrounded by ferns, and a stained glass window. We tramped up the hill, through the village, and took two or three nice views of a group of cottages on the right halfway up the hill, and a view of the same cottages with the bay in the distance. This spot will well repay a visit with the camera.

We then returned to the "Bristol" in time for dinner at 6'30. There is not much in the way of amusement in St. Heliers in the evenings, but a stroll on the pier is very pleasant while enjoying one's cigar. We made the acquaintance of two very nice fellows from London; one of them, from his strong resemblance to William Terriss in the "Union Jack," we christened Jack Medway. The ladies of St. Heliers turn out every evening on the pier. They dress well, are not shy, and prefer to leave their mammas at home.

Next morning, after breakfast, we started, with our slides well filled, to the little terminus at the other side of the town, which in about twenty minutes brings us to Gorey; we walk along the shore and take several views of Mont Orgueil Castle, a very fine old ruin on a promontory towering over the pretty little harbour; after which we catch the train to Grouville, the next station to Gorey on our way back. Here we found several pretty bits notably the village with its quaint old church, on which, we expose a couple of plates. We then returned to St. Heliers, and after a three o'clock lunch we settle up with our host, our bill being ridiculously small, considering the way we were fed and looked after. We didn't forget to reward Kate for her attention to us. There was a little misunderstanding about tipping the said damsel, and the result reminded one of those arithmetical questions. How much did she gain by the transaction? Answer—Seven and sixpence.

Jingle now began to think of returning. He was disappointed in not having paid a visit to Dinan, but hoped to do so another time when the weather would be more favourable. O. and myself went with him in the Weymouth boat as far as Guernsey, as we thought we might finish up the two days that remained by a visit to the lesser island. We disembarked and made our way to Gardner's Royal Hotel, to which we had been recommended, and we found it moderate and comfortable, eight-and-sixpence a day being the inclusive charge. We saw our esteemed friend and jovial *compagnon de voyage*, Jingle, off, and then retired.

Next day we did some instantaneous things on the pier, and a few of the harbour, and then got on the car that was waiting at the hotel, and had a pleasant drive through charming lanes till we reached a very picturesque bay, surrounded by rocks and caves, where we halted for lunch at the Hotel Gouffre; but I can't say that we were pleased with the rather high charge of 2s. 6d. for what we had. The drive home was very pleasant—one of the sights being a wonderful fig tree eighty-five feet high and forty-five feet broad, growing under glass; this tree bears three crops a year, and supplies Covent Garden Market. The hothouse is heated artificially. We certainly felt uncomfortable inside; some facetious members of our party



clamouring to be let out, remarking that they were "turning into figs." We are once more in the cars, and soon are rattling through the town and back at our hotel. After a wash and brush-up, we dine, after which, I am ashamed to admit, all interest in anything further ceased.

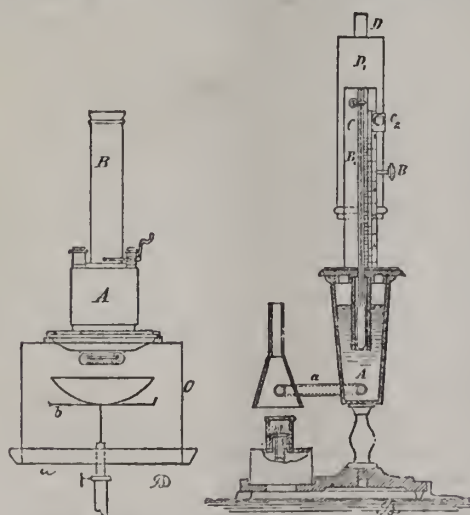
Next day we bid farewell to Guernsey, and after a calm passage in the fine steamer, the *Great Western*, we arrive at Weymouth and catch the train to London, where we arrive about eleven a.m., after a most enjoyable holiday.

### SIEMENS' INVERTED BURNER FOR RAPID EVAPORATION.

WALTER HEMPEL proposes to utilise Siemens' "regenerative burner," on a smaller scale, for the purpose of rapidly evaporating liquids.

In the accompanying cut, *A* is the "regenerative burner," with flame directed downwards, as supplied by the "Fabrik Patentierter Beleuchtungs-Apparate," Dresden (Alstadt), Fabrikgasse 5. *C* is a glass cylinder resting upon a plate *a*, which can be adjusted higher or lower, and the outer rim formed by the cylinder and edge of the plate is filled with fine sand. The capsule containing the liquid to be evaporated is placed upon a support, *b*, which may be raised or lowered independent of the plate. The burner being a stationary fixture, screwed fast to some gas delivery pipe, it is necessary to have the other parts of the apparatus movable. When a capsule is to be introduced or removed, the plate with cylinder is lowered by a mechanism not shown in the cut, and when the flame is required to do its work, it is again raised.

The rate of evaporation is regulated either by the size of the flame, or by raising or lowering *b*. Evaporation takes place very rapidly, much more so in proportion than when applying heat from below in the usual manner. As the capsule does not come



Siemens' Inverted Burner.

Kapeller's Ebullioscope.

in contact with the flame, it does not matter what material it consists of. The author reports that he has concentrated solution of fluoride of ammonium in capsules made of wood and paper pulp. The absorption of sulphuric acid from the flame is the smaller the closer the flame is to the liquid to be evaporated, and none at all is absorbed if the flame is in contact with the liquid.—*Eur. d. D. Chem. Ges.*, 1887, 900.

Since this article has been in type we have received from the manufacturers a circular in which the apparatus is described with greater detail. Some changes have been made in the form of support, and the admission of gas, but the main parts and the principle remain the same.

These burners are made for the present in two sizes. No. 1, consuming about 9 cubic feet per hour, and evaporating about half a pint of water from a capsule 5 inch in diameter, costs 80 marks; No. 2, consuming about 14 cubic feet of gas per hour, and evaporating about fourteen fluid ounces of water, from a capsule 10 inches in diameter, costs 100 marks at the factory.—*American Druggist*.

### ON THE EARLY DAYS OF PHOTOGRAPHY.

BY HENRY C. BRIDLE.\*

It is well to turn sometimes to first principles, to the early lessons, the A B C of any line of study to which we are devoted. It has been therefore thought advisable in this first talk to give a resumé of the history of photography, and if this does nothing more, it will raise in our minds a feeling of respect for those who, through much toil and surrounded with many difficulties, have done so much for the advancement of science, making for us the path smooth and plain which to them was strewn with apparently insurmountable obstacles.

The age we live in is an age of advancement. It is an age of utility. Everything must have an object. Perhaps this is carried too far, for is it not generally the case, if you speak of any new thing being done, any new discovery made, the first question you hear is, "Is there anything in it?" This indefinite term "anything" standing for the definite thing money or money's worth.

In comparing the work of the scientists and the philosophers of the earlier ages with the work of the scientists and philosophers of the present day, we are struck with the difference in the object. The ancient philosopher thought it beneath him to be engaged in devising means for promoting human welfare and happiness, while the modern philosopher is ever making this his goal.

Seneca says:—"The inventions of such things (i.e., things for the use and good of mankind) is drudgery for the lowest slave," while Bacon says:—"The end proposed by science is for the comfort of mankind to work effectively for the purpose of lightening the annoyances of human life." Now, as Barnes has said, "The principles of science are so wrought into the very structure of society, its customs, opinions, language, laws, that no political revolution, no convulsion, no change can ever cause them to be forgotten." This is said of science generally, and it is especially true of photography. Photography is the handmaid of all the sciences. She aids the astronomer in all his observations. She records with accuracy the starry heavens, revealing to him points of light, the possible suns of other systems, which the finest telescope had not hitherto revealed to human eye. She reproduces the eclipse so faithfully that the astronomer can, at his leisure, examine and study the phenomena thus pictured, and make deductions therefrom which are of incalculable benefit, and which would be impossible to obtain under the excitement and haste necessarily attending such an event. Photography is hand in hand with the physician and surgeon in their study of disease, aids the chemist in his work, and besides numberless other ways of usefulness. She pictures for us scenes of home and foreign lands, thus giving pleasure and knowledge which, without her aid, we could not acquire. Photography is dependant on light, chemistry, and optics. Professor Tyndale says that light was a familiar phenomenon to the ancients, and from the earliest times we find men's minds busy with the attempt to render some account of it. In this they made small progress, but they did arrive at the conclusion that light moved in straight lines. They also knew that those rays of light were reflected from polished surfaces, and that the angle of incidence was equal to the angle of reflection; but here they stopped, and it was not until the year 1621 that the law of refraction was discovered. The ancients were familiar with the rainbow, but not until the immortal Newton gave to the world the results of his experiments and deductions was it known that solar light was composite, and not simple. Newton took a beam of light and analyzed it by passing it through a prism, and to his astonished gaze the image of the sun was drawn out to an image whose length was five times its breadth, and divided into bands of different colours. But even Newton did not go far enough, and it was left to Dolland, the optician, to apply and extend the discoveries of his predecessors by proving that in combining two different kinds of glass he could extinguish the colours and produce achromatic lenses—lenses which yield no colour, and which Newton thought an impossibility. On passing a beam of light through a glass prism we obtain an elongated coloured image divided into seven parts—red, orange, yellow, green, blue, indigo, violet—which Newton called a spectrum, and commonly spoken of as the seven primary colours.

If we place a piece of sensitive paper so that the spectrum shall fall upon it, it will not be equally acted upon by the different rays. In one part the action will be very intense, while

\* Talks before the Philadelphia Amateur Photographic Club.



in another part it will be nothing, and on closer examination it will be found that this beam of light is not only composed of seven colours, but also of three different powers or properties. Thus, the chemical or actinic power resides in the blue end of the spectrum, with its maximum in the violet; the luminous power having its maximum in the yellow and exerting no chemical influence, and the heat powers having for its maximum the red. It will, therefore, be seen that it is to the violet rays in light that we look for aid in producing the wonderful results of light painting.

Without the aid of chemistry, photography could have no existence. The early philosophers had their attention called to some striking characteristics of light in its action upon certain chemicals. In their search for the philosopher's stone they tumbled upon a combination of silver with chlorine, which on being fused was converted into a horn-like substance to which they gave the name of horn silver. They found this was blackened by exposure to sunlight, and, as they said silver differed from gold only in being mercury interpenetrated by the sulphurous principle of the sun's rays, they thought this change was the commencement of the process, but as this proved not to be the case, the fact was just recorded and no further search made, and it was not till the eighteenth century that any further progress was made. At that time Scheele, a celebrated Swedish chemist, stated his belief that the blackening was due to a metallic state. To him also is due the credit of discovering, by experiments, the different properties contained in the sun's rays. In 1810 Ritter repeated and confirmed the experiments of Scheele.

Prior to 1828 Dr. Wollastou, of England, had made some interesting experiments with gum guaiacum. The violet rays turned paper stained yellow by a solution of this gum to green, and was soon changed back again by exposure to the red ray. Sir Humphrey Davy noticed that oxide of lead, while moist, is turned red by exposure to the red ray, and puce colour when exposed to the violet ray. He also noticed that a solution of chlorine in water remains unchanged when kept in the dark, but is decomposed into hydrochloric acid by exposure to the sun. In 1802 was published an account of experiments made by Wedgwood, in copying paintings on glass by placing them in contact with paper sponged over with a solution of nitrate of silver, but there being at that time no known chemical that would dissolve out the silver not acted upon by light, and so fixing the image, further attempts were abandoned. From this time to the year 1814 no efforts were recorded of endeavours to increase the knowledge of sun painting. In 1814 or thereabouts Joseph Niepce, in making experiments, discovered a process by which the first permanent sun picture was produced, but he did not use silver salts, but a resin called Bitumen of Judea, spread on highly polished plates of metal. The rays of light changed the bitumen and made it insoluble, while the part not acted upon by light was dissolved away by oil of lavender. Some of his specimens are yet to be found in the British Museum. After some time he accidentally became acquainted with Daguerre, who had also entered the field of experiment. He took a silvered plate, and after exposing it to fumes of iodine, a substance only discovered in 1812, he was able to produce a picture in the camera which he developed with the fumes of mercury, and fixed with hyposulphite of soda. I have read somewhere that the development of the latent image by means of mercury was purely accidental, and it does seem a marvellous thing that Daguerre should have been able to reason out that there was a latent image, and that the fumes of mercury would act as a developer. The use of hyposulphite of soda as a fixing agent had been previously suggested and advocated by Herschel.

About this time Mr. Fox Talbot was experimenting, for in a communication to the Royal Society, dated January 31st, 1839, he states that he had been applying the property of discolouration of the silver salts by light to useful purposes. The paper he prepared by dipping it in a solution of chloride of sodium and drying it, and then placing it in a solution of nitrate of silver. When dry it was brought into intimate contact with the object to be copied, and exposed to the light, and thus a negative was obtained, and this being placed on another piece of prepared paper, and exposed to the light, produced a positive copy. Mr. Fox Talbot thus laid the foundation of photographic printing. In 1841 he patented another process which he called Talbotype or Calotype process. This was the first introduction of iodide of silver applied to paper, which on exposure in the camera to light, received a latent image capable of being

developed by the aid of gallic acid, and fixed with hyposulphite of soda. This method is the main point in the collodion process, and was the starting point for all rapid photographic processes. Great honour is due to these three devoted workers, Niepce, Daguerre, and Talbot, standing as they do as the originators of a branch of science which shall for ever take a prominent part in the thought and daily work of humanity. To obviate the difficulty arising from the use of paper in which the image was formed, and which consequently was not so sharp and well defined as the impression made by the Daguerrean process, Sir J. Herschel proposed and was the first to use glass plates, and in 1847 Niepce de Saint Victor (nephew of Joseph Niepce) produced pictures made on glass plates by means of albumen containing iodides and bromides of silver. These were a great advance on the calotype process, as they gave beautifully sharp distinct images full of delicate details. I shall never forget the delight I experienced when I produced my first albumen negative. I had worked the Daguerreotype process, the calotype, and the wax paper, when my attention was called to this new departure.

In 1851 the Frenchman Le Gray first suggested the use of collodion as the vehicle for holding the sensitive material. But it was Scott Archer, of England, who really made the process practical in the solution of the gun-cotton, or pyroxyline as it was generally called. Iodide alone was first used in the collodion, but afterwards a mixture of bromide and sometimes of chloride was used. The latent impression was developed with pyrogallie acid by Archer, but was superseded by the use of sulphate of iron, suggested by Talbot, but carried into practice by Turrey.

This process kept its ground for more than twenty years almost without a rival, and to it we are indebted for the recording of many an event and phenomena, recalling many delightful tours and events connected therewith, keeping fresh in our minds the faces and forms of many a dear one who perhaps has long passed away, and registering for the aid of science many a phenomenon and transaction which could not have been obtained without its aid. All honour then to this our old-tried and faithful servant, and if at times it seemed to fail us—if, as it were, the very spirit of evil which refused to be exorcised took possession of it—yet we had every reason to be grateful to it, for these fits of temper were only what we ourselves are all prone to, and on account of its great service and general good conduct such small defects were willingly overlooked, and, as before said, the collodion or "lost plate" process, as it is now called, should be remembered with gratitude and honour by those of us who have experienced its friendship.—From *The Science of Photography*.

## HOW TO PHOTOGRAPH.

### No. II.

BY THE PHOTOGRAPHIC CRANK.

EVERY amateur will, of course, begin on landscape work. The taking of fine portraits that will eclipse the best work of city studios should not be attempted by the amateur for the first week at least. The dry plate holders should be covered up with a black cloth before going out into the field, and as little sunlight allowed on them as possible.

**Exposure.**—When the landscape to be taken is picked out, set up the tripod firmly, and screw on the camera. Have that instrument as level as possible. Then, with the black cloth over the head, extend the camera until the picture on the ground-glass is exactly in focus. Place the holder properly, and then you will be in a position to spoil your first plate.

If you will recognise the fact that your first plate is doomed anyhow, you may, by not taking a picture the first time, save many future plates. Here is what may be done. With the cap on the lens, pull out the dark slide half an inch—take off the cap for one second, then replace it. Pull out the slide another half inch; take off the cap for another second. Replace the cap and pull out the slide another half inch, and so on until you know that you have exposed the plate entirely. Then, if your plate is five inches long, you will have given ten exposures. The first strip will have an exposure of ten seconds, the next of nine, and so on to the last, which will have an exposure of but one second.

Then develop that striped plate. One or two stripes will probably blacken the moment the developer is poured on the plate; the others will come up more slowly. When the plate is fixed, you will then see which stripe has had the correct exposure, and



you can then judge about what time to keep off the cap of your lens on a day that is similarly bright. It will help you greatly if you keep an accurate account in a notebook of exposures, giving time of exposure, the hour of the day, whether it was sunshine or cloudy, and any other particulars that may occur to you, and then note results after development. Still, most amateurs get to doing the thing by guess, and as there is a good deal of latitude in development, the results are better than might be expected.

For development you will have to have at least two trays. Vulcanite cost the most and are the cheapest. I use 5 by 8 trays, so that I can develop two plates at a time. Two graduating glasses are needed, one holding four ounces, the other one drachm. Get three bottles, one holding half a gallon, and the other two ten ounces each. A pair of scales that will weigh up to an ounce is needed in making your developer. Here is the formula for the Beach developer, which is a sort of universal developer that will do for any plate or film.

#### No. 1.—Pyro Solution.

Sulphite of soda (chemically pure crystals)	4 ounces
Warm distilled or warm melted ice water...	4 "
When cooled to 70° add—	
Sulphurous acid water (strongest)...	3½ "
Pyrogalllic acid ...	1 ounce

#### No. 2.—Potash Solution.

A.—Carbonte potash (pure) ...	3 ounces
Water ...	4 "
B.—Sulphite of soda (pure) ...	2 "
Water ...	4 "

Mix A and B separately, and then combine on one solution, marking it No. 2. These solutions will keep for a long time, while most other formulæ will not, and so besides being a very concentrated solution, it is a very economical one. To make

**Working Developer.**—Put four ounces of water into the large graduate, and put into the water two drachms of No. 1, and half a drachm of No. 2. Put your plate film side up in one of the ebonite trays, which should be marked "pyro," and pour over it the developer, seeing that all the plate is covered. Rock the tray gently, so as not to allow air-bubbles to remain on the plate. The picture will gradually appear on the white surface of the exposed plate. If it comes up very slowly, put some more of No. 2 in the big graduate (say half a drachm) and pour the developer out of the tray into the glass; then quickly pour back on the plate again. Not more than four drachms altogether of No. 2 should be used in four ounces of the developer, for if the picture does not come then, the plate is hopelessly under-exposure.

Is is hard to tell in print just when the picture is developed enough. It is a good plan to get from some photographer a correctly developed plate, and compare the one you are working at with the completed one. By looking through the plate at the red light you can see whether the picture has detail enough—whether you can see everything you want to see in the picture. When it is done, wash it for a minute or so under a tap, and then put it into the hypo solution. Into the big bottle, before you begin developing, put a pound of hyposulphate of soda. Then fill up the half gallon bottle with water. When the hypo crystals are dissolved the hypo solution is ready for use. A pound of hypo costs about six cents, and I use a large bottle so as to save the trouble of weighing the hypo. Buy a pound at a time. When the picture is developed, if you look at the back of the plate you will see that it seems covered with a milky white film. After it has been in the hypo tray for ten minutes you will notice that this whiteness has almost all disappeared. When it is completely gone the plate is fixed and can be taken to the light. The plate should then be well washed under a tap, and stood in a rack to dry. When it is dry it is ready to print from. The hypo tray should be marked "hypo," and be never used for anything else. Beware of the hypo. It is what photographers call a "brute." If a drop gets into the developing solution it is all up with that particular plate. If you put your fingers into the hypo, and then, without washing them thoroughly, put them into the developing tray, you will ruin your work.—*The Detroit Free Press.*

## Patent Intelligence.

### Applications for Letters Patent.

11,578. JULES DECOUDUN, 53, Chancery Lane, London, for

"Improvements in photometers for measuring intensity of light in the photographic camera."—August 10th, 1888.  
11,802. EDMUND JOHN PASSINGHAM, Sunbridge Chambers, Bradford, for "Improvements in the method of and apparatus for finishing photographic prints."—August 16th 1888.

Patent which has become Void through Non-payment of Duty.

2,156 of 1832. F. WIRTH. (*Meisenbach*).—Photographic plates

### Specification Published.

8,729. WALTER PEAD, of 99, High Street, Ramsgate, in the county of Kent, Bookbinder, for "An improved instantaneous shutter for photographic purposes."—Dated June 14th, 1888.

A diaphragm is arranged between the lenses of a camera in the same manner as an ordinary diaphragm, and which has double walls so as to leave between the same a slot or guide.

A plate is fitted into the slot and adapted to slide therein, the said plate having an aperture of sufficient size to allow the passage of the rays of light through the opening of the diaphragm when the said aperture and opening coincide or are opposite to one another during the movement of the plate or slide.

There is a spring catch, the free end of which is designed to engage in the hole in the slide when the latter is in its raised position ready for operation.

There is also a lever pivoted to the diaphragm and extending between the said catch and the wall of the diaphragm so that when the said lever is moved the end of the catch will be drawn out of the hole.

An india-rubber or elastic spring is provided which is attached to hooks at the edges of the diaphragm, and passes over a hook on the upper end of the slide.

The claims are:—

1. The combination with a diaphragm adapted to be inserted between the lenses of a photographic camera of a plate capable of sliding in or upon the said diaphragm, substantially as and for the purpose described.

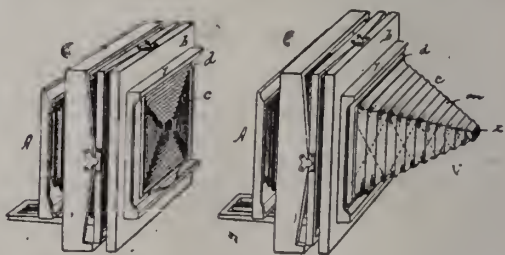
2. An instantaneous shutter comprising a diaphragm having double walls and a plate sliding between the same, substantially as described.

3. The improved instantaneous shutter constructed and arranged to operate substantially as herein before described.

### Patents Granted in America.

337,092. THOMAS W. MANN, Holyoke, Mass., for "Shading hood for photographic cameras."—Filed Nov. 19, 1886. Serial No. 219,337. (No model.)

*Claim.*—1. A shade-hood for photograph cameras, consisting of the flexible body *m*, attached by one end to the camera and having an opening in its free end, combined with the lazy-tong



frames *n*, attached by one end to the camera and to said hood, substantially as set forth.

2. The combination, in a camera, of the frame *d*, having the cross-bar *v*, the collars *o*, and the spring *w* on said bar, the lazy-tongs *n*, having one end pivoted to said collar, and the flexible hood *m*, having its base attached to said frame, and inclosing said lazy-tongs, substantially as set forth.

3. A shading-hood for photographic cameras made in pyramidal form of flexible material, and having an opening through its apex opposite the ground glass of the camera, and having an internal frame-support which is collapsible together with said hood, whereby the said open end of the latter is permitted to be moved toward and from said glass, and the hood, when distended, is supported in substantially a horizontal position, or one at right angles to the side of said glass, substantially as set forth.



## Correspondence.

### IVES ON ISOCHROMATIC PHOTOGRAPHY.

SIR,—Mr. Haddon, who calls attention to the fact that many, when describing new experiments, do not give sufficient data (p. 464), is mistaken in his "for instance." The information which he says I did not give, I gave several times, in the *Photographic News*, and elsewhere. See *Philadelphia Photographer*, December, 1879; *Photographic News*, September 5, 1884; *Year-Book of Photography*, 1885; *Anthony's Photographic Bulletin*, July 11, 1885; *Journal of the Franklin Institute*, October, 1886, &c., &c.—Respectfully yours,  
FRED. E. IVES.  
*Philadelphia, August 8, 1888.*

### WILSON'S HAND-BOOK.

DEAR SIR,—Allow me, as a plain-spoken lover of justice and mutual charity, to enter my sincere protest against the uncharitable, and withal unwarrantable, criticisms upon Mr. Wilson's "Hand-Book," which I have read in your issues of August 10th and 17th, signed by a person of the name of W. Heighway.

I cannot conceive Mr. Heighway's object in so writing of a fellow-author, whose works are more numerous, and decidedly more appreciated than his own, unless it be in imitation of some of the criticisms of John Ruskin. If this supposition be correct, I hasten to inform Mr. Heighway that his attempt is a huge failure.—And remain, dear Sir, yours faithfully,  
JOHN A. TENNANT.

30, Northgate, Darlington, August 20th.

### JAPANESE PAPER FOR POLISHING GLASS.

DEAR SIR,—We wish to bring to your notice a paper which we are importing specially for the use of photographers for cleaning glass plates, and similar purposes, to take the place of cloths. It is largely used by continental photographers, and possesses great softness without the dust generally to be found in Japanese papers, besides being less than half the cost. We shall place this paper on the market at 20s. per bundle of 2,400 sheets, size  $18\frac{1}{2}$  by  $16\frac{1}{2}$ ; and hope you will do us the favour of reporting on any advantage you may find it possess, for which purpose, we enclose you a small sample.

CHARLES STRAKER & SON.

*Bishopsgate Avenue, Camomile Street, August 20th, 1888.*

[We are pleased that our remarks on the use of Japanese paper for cleaning glass have given occasion to Straker and Co. to contemplate putting a special paper upon the market for glass cleaning purposes, one real advantage of paper over cloths being the non-liability of contamination of the plates with chemicals carried by cloths from articles previously wiped. With regard to the sample of paper sent, we are inclined to regard it as inferior to the Japanese as regards the power of removing adherent dirt, but it is softer to the touch, and rolls up into a somewhat more yielding pad. The very much lower price, however, will, perhaps, make it the more desirable material to use.—ED. P. N.]

## Proceedings of Societies.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE ordinary weekly meeting was held on the 16th; A. COWAN occupied the chair.

An excellent series of platinotype prints of Lichfield Cathedral was exhibited by S. G. B. Woollaston; the negatives were taken during the recent Convention, stripping films being used, in the manipulation of which the exhibitor is admittedly an adept.

A question from the box was read:—"Is the general ex-

perience of the members in favour of gelatino-bromide plates for lantern transparencies?"

F. P. CEMBRANO used collodion.

J. B. B. WELLINGTON said under circumstances it was not possible to make collodio-bromide emulsion. Gelatine plates were very convenient. Although he could not say that there was any marked difference in the finished transparency made from either of the two processes, yet he should give preference to the collodion.

J. J. BRIGNSHAW thought as good lantern slides could be made on gelatine plates as by any other process, and the plates had the great merit of being easily manipulated, and further the keeping properties of gelatine plates were in their favour.

F. P. CEMBRANO remarked that collodio-bromide plates could be kept for some time if care was taken with regard to their storage. He had recently developed some collodio-bromide plates made seven months ago, and he was of opinion that they had improved with keeping.

F. A. BRIDGE thought that there was little to choose between the two processes under discussion. The gelatine lantern plates now in the market gave excellent results.

W. ENGLAND said a large number of slides were turned out from his establishment every week from chloride plates.

F. P. CEMBRANO thought a long exposure was necessary with gelatine plates to obtain warm tones.

J. J. BRIGNSHAW advised the use of the soda developer for gelatine lantern plates. This would produce an agreeably warm tone with a normal exposure of the plate. The competition of lantern slide processes instituted by the Association some three or four years ago, he could state, created a great deal of interest, not only locally, but in the provinces. Other processes had since come into favour, and he would suggest that a lantern slide competition be held at a date to be fixed by the members; the competition being quite open, each member being at liberty to enter with any process he has taken up.

The Chairman proposed that J. B. B. Wellington should select two negatives for this purpose. This was agreed to. Members on application to have the use of these negatives for a given time for the production of the transparencies.

F. A. BRIDGE passed round a silver print showing patches of white spots.

S. G. B. WOLLASTON thought the spots were caused by bubbles in the sensitizing of the paper, an opinion that several other members shared.

Another question from the box was read: "Is a 4-inch condenser sufficient for all ordinary lantern purposes, or is a  $4\frac{1}{2}$ -inch condenser to be preferred?"

F. A. BRIDGE said a 4-inch condenser was to be preferred for the extra amount of light obtained with it, provided that it covered well; but from experience he knew that a great many condensers of this size did not, therefore it was safer to recommend a  $4\frac{1}{2}$ -inch. Many exhibitors, he knew, worked with  $3\frac{1}{2}$ -inch condensers, using only circular masks with their slides; by this means an appreciable increase of illumination was obtained. The several forms of condensers being referred to, F. A. Bridge said he preferred a double convex and meniscus combination.

S. G. B. WOLLASTON, referring to a question of development, said a friend of his, using the same plates and developer as himself, always got green fog on his negatives; but when the plates were developed at his (Mr. Wollaston's) place, the plates came out quite clear, water drawn from the same source of supply being used in each case; this had happened on each occasion that it had been tried. He proposed to bring some of the negatives to the next meeting; he was quite unable to explain it.

The subject for discussion on the 30th inst. will be "Lantern Condensers."

### PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

At Committee meeting held on 15th inst. the election of the following members was confirmed:—C. S. Grey, Brighton; J. R. G. Stroud, Walter Horrocks, G. Beaumont, Henry Mavius, and Harold Mavins, of Jersey; J. Pyefinch, Shrewsbury; R. W. Vince, Anerley; and Miss C. Griffiths, Huddersfield.

John Pyefinch, of Shrewsbury, was appointed Hon. Local Secretary for that district.

J. T. Craig and E. A. Whittemore, London, were elected members of the Association.

The Committee then considered two applications for assistance, after which the meeting terminated.



## Talk in the Studio.

**PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.**—The next monthly technical meeting will be held on Tuesday, August 28th, at 8 p.m.; open 7 at p.m. for Journals, &c.

**INTERNATIONAL COPYRIGHT OF PHOTOGRAPHS.**—The case in which A. E. Whitehouse, of the Hyde Park Gallery, was summoned by C. Hauff, the London agent of Adolphe Braun and Co. (see page 528 of our issue of last week), came on again for hearing on Wednesday, at the Westminster Police-court. Mr. Mann appeared for the prosecution, Mr. R. C. Glen was counsel for the defendant. Mr. Mann's contention was that the Act of 1862, which spoke of copyright works of a British subject, incorporated the old Act of 1844, and the Order in Council thereunder, dated 10th January, 1852 (made in consequence of the Convention between the English and French Governments) giving reciprocal rights to authors of both countries. Mr. D'Eyncourt pointed out that if this was the case, the preamble of the 1862 Act was inconsistent. It referred to copyright of British subjects. That was the first Act which alluded to photographs. Mr. Mann said he further relied on the recent Act of 1886, which carried into effect the Convention of Berne incorporated in an Order of Council of November 28th, 1887. This gave to the author of a literary or artistic work, first produced in one of the foreign countries of the Copyright Union, the same right of copyright as if the work had been first produced in the United Kingdom. Mr. William F. Benham, solicitor, gave evidence of the purchase of the alleged pirated photographs, and stated that the defendant did not have them in stock at first, his assertion being that they had not been printed owing to the wet weather. After the sale, and when served with a subpoena to produce the negatives, which he promised to do, he said that all the dealers did very much the same thing, and he supposed Messrs. Braun proceeded against him through spite, an assertion which was denied. He also said that he was only conducting the business for the trustees of the late firm, of which he was a member. A partner in the firm of Braun and Company, from Paris, and Mr. Hauff, the London agent, swore that the photographs put in evidence were piracies, and that they had been copied from reduced negatives. Other formal evidence was given as to registration, and at the conclusion of the case for the prosecution Mr. Glen said the pictures were produced before registration, and upon an authority of a decision in the Court of Appeal no penalties could be taken in respect of the sale of such after registration. The case was further adjourned for evidence on behalf of the defendant.

**SAFETY STOP-COCK FOR GAS BURNERS.**—Accidents happen not unfrequently through the flame of a gas-burner or gas-stove striking back to the orifice where the undiluted gas issues, and by overheating the rubber-tubing sets fire to the latter and to surrounding fixtures. Various plans have been heretofore proposed to prevent damage from this cause. But, while all these plans provide for the extinction of the burning gas or flame, none of them insures the interruption or stoppage of the current of gas. Klobukow has recently described a device which appears to accomplish the object by causing the gas delivery tube to be compressed by springs set into action after the fusion of a composite ring holding them apart. The apparatus is a peculiarly constructed stop-cock, with strong springs, which is applied to the gas-burner in the manner to be explained. The rubber-tubing attached to the burner passes through a ring and between two parallel bars, which are kept apart by levers, the ends of which are held in place by the ring, made of low-fusing metal. As long as this ring holds the ends of the levers, gas will pass through the tube. As soon as the ring is taken off or broken, the springs will come into action, and cause the two parallel bars to be pressed together, thereby shutting off the supply of gas. The ring upon which the action depends, and which is situated where the effect of heat (caused by the striking back of the flame) is first noticed, is made of a composition suitable to correspond to the temperature which is not to be exceeded. The best material to make the rings of is the fusible metal of Wood or Lipowitz, which melts at a temperature of 74° C. (165·2° F.) and 71·5° C. (161° F.)—*From the Druggist.*

**PHOTOGRAPHIC CLUB.**—The subject for discussion on August 29th will be "Keeping Properties of Gelatine Plates." Saturday outing at Chingford.

## To Correspondents.

\* \* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

**C. L. ROTHERHAM.**—If made more dilute, the action will be stronger, as gelatine does not readily absorb a strong solution. Indeed, a saturated solution scarcely softens gelatine.

**C. C. VEYERS.**—Thank you for sending it to us.

**THORNTON PICKARD.**—There appear to be several interesting points about the apparatus referred to.

**J. C.**—None were sent with the article.

**W. MORGAN.**—If during the whole hour a stream of water is running over the print, first on one side and then on the other, we think the hour's washing would be preferable. Long soaking, especially in hot weather, leads to a disintegration of the surface, and lack of brilliancy.

**LENS.**—F/6 means that the diameter of the stop or aperture so marked is one-sixth of the focal length of the lens for parallel rays. Cheap foreign lenses are often incorrectly marked.

**ANTIPODES.**—No such arrangements have as yet been made for such a proceeding, and we do not think it likely that arrangements will be made.

**BATHONIAN.**—See answer to R. B. Baker, last week.

**C. BAXTER.**—The addition of a little sugar is useful as causing it to sink in the paper less rapidly. To each ounce add thirty grains of loaf sugar.

**H. C. V. W.**—The paper is printed just as sent to us by the agents of the Convention. If sketches had been sent, they would have been reproduced.

**M. R. WARRINGTON.**—1. For such purposes it is very desirable to have a tripod with legs the length of which can be adjusted. Any dealer can supply such a tripod. 2. According to strict law you have no right to use the arrangement, provided the patent is, good. But we think you are quite safe. 3. An exposure of less than one-fiftieth of a second will probably suffice, but there are very few shutters in the market that will give so short an exposure.

**F. BARBER.**—The method is one almost identical with that form of the carbon process introduced by Pouncy, and possibly we may have something to say about it before long.

**PRINTER.**—Keep the prints down by stretching a string net over a frame that fits inside the tank, the net being adjusted about two inches below the surface of the water.

**DENSE.**—A solution of bleaching powder—the so-called chloride of lime—to which a small quantity of hydrochloric acid has been added. Take care not to make it too strong, a convenient strength for commencement being a drachm of the bleaching powder agitated with a pint of water and filtered, after which twenty drops of hydrochloric acid are added.

**LEX.**—The process which has been most extensively employed up to the present time is the substitution method, in which a somewhat intense collodion positive is floated off the glass and immersed in a solution of the chlorides of platinum and palladium until the whole of the silver has been replaced by these metals. After the removal of the chloride of silver by ammonia or hyposulphite, the film is floated on the enamel tablet, dried, and fired. Still it is a question whether it will not be better for you to adopt the "dusting on" method, which is fully described in a series of articles which appeared in the PHOTOGRAPHIC NEWS during 1882.

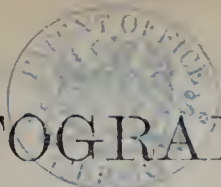
**THOS. B.**—This is what the inventor says, but we are inclined to think that no user of the article will endorse his statement. Write to the manufacturer of the article and ask him to let you have one on approval.

**NITRATE OF SILVER.**—There are considerable objections to its use, the principal objection being that the solution penetrates the porous body of the earthenware, and renders the vessel liable to contaminate anything which is subsequently put into it. Why not use a glass vessel?

**DARK ROOM.**—1. Paper stained with picric acid answers very well, but the colour soon disappears, owing to the volatilization of the colouring matter. The yellow cloth sold as "Golden Fabric" is to be preferred, this being, we believe, coloured with binitronaphthol yellow. 3. It was described by W. E. Debenham some time back, and you can find all particulars by looking through the back volumes of the NEWS.

**COLLODION.**—Commercial distilled water invariably contains a trace of ammonia, and this accounts for what you refer to.





# THE PHOTOGRAPHIC NEWS.

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### NATURAL CLOUDS IN PHOTOGRAPHS.

IN our article last week on cloud effects in photographs, we dealt with the subject of printing clouds from separate negatives into pictures in which cloud effects were either originally absent, or had been removed to make way for those introduced by separate printing. We propose now to take up the question of what are called natural clouds in photographs, by which expression it is understood that the clouds and accompanying landscape or view have been photographed simultaneously upon the negative.

Seeing that most successful photographs are occasionally produced, in which the sky shows with beautiful natural effects of cloud and variety of tone, at the same time that the rest of the picture comes out properly, it is worth while to consider what are the conditions under which such photographs have been made, in order to ascertain whether such conditions may not be more generally fulfilled, so that at all events a greater proportion of photographic pictures than has hitherto been the case shall be produced with the effects of sky that have actually accompanied the rest of the scene, rather than have a sky either blank, or filled up with cloud-effect which may or may not be such as would be natural in connection with the view.

It will be noticed that generally those pictures in which natural clouds appear with sufficient force are pictures of sea and sky, or of snow scenes. In these cases the exposure required for the foreground and other objects is so short that the sky itself is not much overdone when exposed simultaneously with them. The production of natural clouds in the negative is, however, not strictly limited to the cases mentioned, and the question before us is whether this accompaniment of a natural sky cannot be more extensively made use of than has generally been the case hitherto.

The difficulties attached to the general production of landscape negatives with accompanying clouds in good relation to the rest of the picture, belong to deficiencies of the photographic representation of the images presented to the camera coming under the head of optical or chemical causes; the means to be taken to overcome these difficulties will then relate firstly to the removal of such deficiencies themselves by the adoption of means necessary to obtain the most perfect photographic representation, and secondly to mechanical or other means for removing or abating the deficiencies which cannot otherwise be completely eliminated.

Two notable deficiencies or defects in the photographic process which militate against the successful production of clouds along with the landscape are, one, that the photograph does not register truly the varying degrees of light, but after a certain amount all high lights are represented by one equal or nearly equal degree of intensity; and the other, that the colours attaching to the objects in the

landscape, green particularly, have not a photographic value proportionate to their effect upon the eye of the beholder, so that in order to get them represented as sufficiently light in the photographs, those parts which have a more active colour—such as the sky—must be disproportionately over-exposed.

To take first the failing of the photographic process to register differences in the high lights. It is evident that this failing will, when it exists to any great extent, show itself by rendering the sky of one even tone, instead of exhibiting that variety amongst the lights which mark cloud forms. In this connection it must be noted that differences in the preparation of the sensitive film, and of the methods of development, will produce marked difference in the degree of truthfulness with which different amounts of light will be registered in the picture. We have known gelatine plates in which lights that we may call those of the second order would very soon overtake those of the first order, and the resulting picture was one consisting much more largely of one monotonous tone in the lights than ought to have been the case. Such pictures would be said to be deficient in "sparkle," the word being used to define that crisp standing out of the highest lights upon those of the second degree, which we see in nature, and which lends such a charm to a more perfect production, either of the camera or pencil. This particular defect is by no means to be confounded with want of density. It may even be accompanied by excessive density, whilst on the other hand a thin image may possess good gradation, and only require the application of an intensifier to produce a perfect result. The want of true registration of light is not confined to rapid plates, though probably it is in them most frequently found. We remember to have met with it in a striking degree in the wet collodion era, when working with a collodion iodised with cadmium only. Not that all cadmium collodion showed itself thus inapt, but in our own practice it was rather characteristic of this iodiser.

In addition to the particular constitution of the sensitive film, the mode of development has considerable influence in modifying the extent to which the more exposed portions of the plate give evidence of having received varying degrees of light acting upon them. We have found that to commence the development by immersion in dilute ammonia, as has been sometimes advised, has tended in our hands to produce that flatness which is due to insufficient discrimination of strong but varying lights in the picture. We speak with some diffidence on this point, as the particular mode of development referred to has been strongly recommended by some workers whose opinions must be considered as weighty. On the other hand, some pictures, in which the registration of lights throughout has been particularly good, were developed, as we were informed, with a very large amount of bro-



vide, the negatives having been much too greatly over-exposed to come up well under ordinary treatment. We recall to mind a set of photographs of this character shown by Warnerke at one of the technical meetings of the Photographic Society of Great Britain. These pictures, it is true, were of interior subjects, but the contrasts of light were in nature very strong, and the results were so good that we feel tempted to enquire whether that particular proceeding—*i.e.*, long exposure and highly restrained development—may not be the best to adopt when practicable. If such prove to be the case, the expression “over-exposure” must be withdrawn, or used only as relative to the exposure that would suffice with a more customary development. The question of the best means to adopt in order to obtain a more perfect registration of the degrees of light in the subject to be photographed is a very interesting one, and one that deserves fuller investigation than it has hitherto received. Meanwhile, as an aid to the reproduction of cloud effects in our pictures, if for no other reason, we must select such plates and such method of development as we find to give the truest registration of various degrees of light.

The next point to be considered is the difficulty caused by the photographically inactive character of the light proceeding from the foreground and even distant objects, such, for instance, as the green of the landscape, compared with the bluer tint pervading the sky. Here of course we may reasonably hope for help from the orthochromatic methods of preparing plates sensitive to the less refrangible rays, and from the use of the colour screen. The elegant method of preparing orthochromatic plates recently described by Ives\* puts it in the reach of every one to sensitize plates either with erythrosine or chlorophyl; while the recent announcement by Dr. Wolheim,† that phyllocyanin produces orthochromatic effects identical with chlorophyllan, will probably cause many experimentalists to substitute phyllocyanin for chlorophyllan in Ives's latest method of employing such sensitizers.

Remembering what excellent work in pictures with natural clouds has occasionally been done in the past, we look forward, with the help of the orthochromatic principle, and of more thorough investigation of the conditions on which true registration of degrees of photographic action depends, to seeing a much extended use of the skies incidental to the view that is photographed than has hitherto been adopted.

We come next to the mechanical means that have been employed for giving less exposure to the sky than to the other parts of the picture, so that the over-powering effect of light from the clouds, as well as from the clear portions of the sky, may be restrained sufficiently to prevent them from being lost in one general light, whilst the foliage and foreground are receiving sufficient exposure to bring them out. An objection that may be urged against methods of this kind is, that it is not possible to shut out the sky with anything like exactness, and that if it were possible, there would remain a hard line destructive of all artistic and realistic effect. Where foreground objects rise into the sky in places, it is obvious that in shielding the sky the foreground object will be shielded also, and so come out unnaturally dark. Nevertheless, there is frequently an advantage in some of the contrivances that have been adopted, and such are often employed with benefit. A very early contrivance was that of the late T. Sutton, who placed the diaphragm in a sloping position, the upper part forward. In this way the light from the foreground was admitted through a circular aperture, whilst the opening presented to the sky was in effect a narrow oval having its long axis of the size only of the diameter of the circle. This arrangement was contrived for use with a single lens. For a doublet, a special arrangement would have to be fitted up inside the lens tube. Another contrivance now in common use is

a spring shutter passing from side to side, and having its opening so cut as to give longer exposure to the foreground than to the sky. Yet another arrangement is one which we remember to have seen very thoroughly worked out by W. K. Burton. The general character of this arrangement is a flap shutter consisting of a piece of cardboard cut nearly to the form of the sky in the scene. This shutter is worked either inside the camera, when the hinge on which it turns is at the bottom; or in front of the lens, when the hinge is at the top. In either case the flap must be sufficiently far from the lens to prevent it from shielding too vague and uncertain a portion of the picture, and yet not so far as to cause a perceptible line to be formed. The general exposure is given by a second flap or by a cap, and the flap itself is only opened for such a short space of time as may be deemed requisite for the sky. All such mechanical means are necessarily imperfect, for the reason given, that there is no definite edge permissible, and we must either shield part of the view itself, or permit that portion of the sky contiguous to any other part of the picture to receive more exposure than the rest of the sky.

There is yet another means of obtaining the representation of the cloud forms in the sky of the negative, and it consists in reducing the intensity of the sky on the plate, or of intensifying the rest of the picture whilst the sky is not intensified. For this purpose it is necessary that a good gradation of tone exist in the sky of the negative, although it may in its original condition be too intense with relation to the rest of the picture. We have seen good effects produced in both ways. If it is desired to make the difference of intensity gradual, the negative may be treated quite wet; and if the reducing process is employed, the solution, ferric oxalate, ferricyanide, or hypochlorite as preferred, used with a soft large brush, the sky edge being kept lowest. If it be desired to make the edge rather more sudden against some object rising against the sky, the negative may be treated when in a partially dry condition. The method of partial intensification is adopted when the sky itself is of proper density, but the rest of the negative is lacking in vigour. The same variation of treatment, either whilst entirely wet or when partly dry, is admissible as has been referred to in connection with the reducing process. For this partial intensification we have found the method with iodide of mercury followed by Schlippe's salt described in the last YEAR-BOOK very convenient. The mercury solution is applied with a brush, and if in any place it has extended more than was intended, it is only necessary to avoid such place when following with the Schlippe's solution. After washing, another immersion in the hypo will remove the intensity given by the mercury where it has not been fixed by the application of the sulphantimoniate.

Of the two methods of producing cloud effects in photographs, we certainly prefer, when the subject admits of it, the method by which the sky actually accompanying the view is represented; but either may be used with advantage according to circumstances, although a plain sky is to be preferred to such printed-in effects as have too often been presented.

#### AN ASSISTANT DETAINING PHOTOGRAPHIC APPARATUS AS A GAGE FOR HIS PAY: LEGAL DECISION.

A LEGAL case which presents points of special interest has recently been decided in the Norwich County Court by Judge Price.

Albert Edward Coe, Photographer, of London Street, Norwich, employed the plaintiff to make the necessary exposures for a series of views of the Norfolk Broads, Mr. Coe finding the apparatus, and undertaking the development of the exposed plates. In the end, Mr. Coe declined to pay the full amount, on the ground of the work being

\* PHOTOGRAPHIC NEWS, page 335. † PHOTOGRAPHIC NEWS, page 513.



unsatisfactory, and the assistant then declined to return the apparatus. Mr. Coe then took proceedings in the County Court for the recovery of the apparatus or its value, and in the end the assistant was ordered to return the apparatus or pay its value. His claim against Mr. Coe does not seem to have been adjudicated upon by the judge.

All photographers will understand the difficulty of a case of this sort, a case in which so many disturbing influences may affect the quality of the resulting negative. At any rate, the case in question affords no encouragement to assistants to detain the property of the employer as security for money due.

The following report from the *Eastern Daily Press*, of the 22nd August last, is interesting as a record of the case:—

NORWICH COUNTY COURT, SHIREHALL, TUESDAY, AUGUST 21,  
BEFORE HIS HONOUR JUDGE PRICE, Q.C.

*Employer and Workman; Photographing the Broads.*

COE v. YOUNG.—In this case Mr. A. E. Coe, photographer, of London Street, had employed Mr. Young, a photographer, to do certain work, and for that purpose had entrusted him with photographic apparatus. The work had been completed, but not being satisfactory, he had not paid for it in full, and defendant kept the apparatus. He accordingly brought an action to recover £19 5s. 8d. for the detention of the apparatus. Young put in a counter-claim of £21 19s. 6d. for non-payment, damages, &c. Plaintiff was represented by Mr. Davies. His Honour, having read the items of the set-off, said the greater number of them were perfectly ridiculous, and he questioned whether they were recoverable. He considered it as being more of a breach of agreement, and therefore it ought to have been brought as a counter-claim. He proceeded to try Mr. Coe's claim. Plaintiff was sworn, and stated that the articles Young still retained were his property, and used in his business. He had been deprived of their use since June, and had to replace them at a cost of £7 or £8. He gave defendant a number of photographic plates, which he was to use and return to plaintiff with images on them, or else in their original condition. Thirty-six of the plates (worth 12s.) had not been returned to him in either condition. Defendant said he had returned the plates in the form of exposed negatives, and he had kept the apparatus because Mr. Coe had not paid him. Mr. Coe proved that he had not received the plates. His Honour said defendant had no right to keep the apparatus. It was not a case of lien. He accordingly gave judgment for plaintiff for his full claim of £19 5s. 8d.

The counter-claim was then tried. Young, being sworn, said he entered the service of Mr. Coe as an operator and retoucher on the Tuesday after Bank Holiday. Some time afterwards Mr. Coe told him he would like to have a series of views of the Norfolk Broads, and commissioned Young to take the series. Mr. Coe was to supply him with plates, to be exposed by him, and then returned to Mr. Coe to be developed and finished. The price agreed upon was £15 15s. for the whole job. His Honour—Then I understand there was a contract in which you undertook to do the work satisfactorily? Young—There were no terms in the agreement as to the quality of the work. His Honour said that in law a contract implied competency on the part of the person who undertook it. Young said the productions were the best his skill could produce under the atmospheric circumstances, which were not suitable. He was not supplied with the most sensitive form of plate which was essential to successfully photographing the Broads. Mr. Coe advanced him £6 10s. for out of pocket expenses, which he had spent twice over. When he completed the work and went for his remuneration he was told that the work was unsatisfactory, and that he would not be paid. He had had no complaint before. Mr. Davies said the photographs were bad in many respects, and practically worthless. Young denied this, but did not call an expert to speak to their value. His Honour, in giving

judgment, said the £6 10s. advanced reduced Young's claim of £15 15s. to £9 5s. He could not recover his rail fare between Yarmouth and Norwich. As to the special damages Young averred his character had sustained through the allegations of incompetency, which he estimated at ten guineas, his Honour said he had caused that himself by bringing the action. Judgment was given in favour of Mr. Coe for £19 3s. If the photographic apparatus was returned within a week the amount would be reduced to £13 13s. This Young promised to do. Costs for two scientific witnesses were also allowed Mr. Coe.

CHAPTERS IN ELEMENTARY PHOTOGRAPHY—  
A GUIDE TO BEGINNERS.

BY W. M. ASHMAN.

EIGHTH ARTICLE.

WHY are stops placed in front of some lenses, and not so in others? it may be asked. We are now able to recognise that, in the case of single lenses, the proper position for a diaphragm is at an easily ascertainable point somewhere in front. In practice we always find landscape lenses constructed in that manner; then why not the doublet or triplet combinations, it may be argued, instead of a central situation in the tube? This latter alternative, it may be said, has been chosen because in practice it proved more serviceable. If a diaphragm be placed in front of a doublet combination, the area of illumination, or field, as it is called, will, in consequence, be diminished without conferring an equivalent advantage therefore—that is, so far as lenses having a tolerably flat field, like those of rectilinear type, apply. But in the case of a portrait doublet the limited disc which would be produced would be more sharply defined over the entire area represented, or in other words, the field would be flattened. Preference is, therefore, given to a central position, in order that the field may not be curtailed, although it is at the expense of a little curvature; and with large size diaphragms this becomes more apparent than with small. It is with a view to lessen the defect of curvature as much as possible that experienced photographers, who use portrait lenses, take the precaution to arrange the accessories they desire to be prominent in a picture in a more or less crescent form around the principal subject, leaving those portions which they wish to appear subdued to suffer from spherical aberration. The employment of a small diaphragm, or a lens having a flat field, would defeat this object. Large groups of persons are usually posed in crescent form in order that those who occupy positions at each end may not appear blurred, which would occur if all were placed in a straight line. We have seen that marginal rays come to a focus nearer than central rays. Photographing a large group is an illustration of this. To return to our subject of diaphragms—the kind known as “Waterhouse,” and introduced by a gentleman bearing that name, are strips of metal (blackened brass) thin enough to pass through a narrow slot into a collar fixed in the lens tube. These are pierced in circular form, and the aperture of each bears a fixed and unalterable relation to the focal length of the lens. Starting with the aperture of the stop plate or the largest size diaphragm provided, we have the full working capacity of the lens, which may be one-fourth, one-eighth, one-twelfth the equivalent focus. The insertion of a stop the next size smaller reduces the value of the aperture, perhaps one-fourth, and, as a consequence, increases the length of exposure to about double. The effect will be to give increased sharpness with less brilliancy, and the smaller the diaphragm employed the more pronounced will these characteristics be. J. H. Dallmeyer says:—

Always use the largest possible stop in order to secure vigour, roundness, and atmospheric effect in the picture. A small stop produces sharpness, but at the expense of the foregoing essential qualities. As a rule, focus for some prominent object in the



foreground, or upon that which is to constitute the point of interest in the picture. Do this with a medium stop, then insert the next or the next but one smaller, sufficient to prevent objects not focussed upon appearing too much blurred.

The Photographic Society of Great Britain, acting upon the recommendation of a select committee appointed to consider the subject, issued a standard which they called the Universal system, and they based their calculation upon the relationship of aperture to focal length, starting with the portrait doublet at its maximum serviceable opening  $\frac{1}{4}$ , or one-fourth of the equivalent focal length. Rectilinear doublets can be had to work at  $\frac{1}{4}$  and upwards.

Leading opticians are not all agreed as to whether the system is the very best which could be easily adopted, and until they arrive at a definite understanding among themselves the system is universal only in name. Its value may be practically illustrated thus:—Given a lens known to be of twelve inches equivalent focus, in which there is a diaphragm of one inch diameter, and an exposure of two seconds upon an ordinary dry plate is found sufficient for a dimly-lighted subject, the stop would be said to represent  $\frac{1}{12}$ —one-twelfth the focal length. Replace this stop with one of half an inch, and we quadruple the necessary exposure thus:—12 multiplied by itself is 144, and 24 multiplied by 24 equals 576.

The Waterhouse diaphragm necessitates a separate plate of metal being used for each aperture required. To obviate this inconvenience a rotating plate is sometimes used in the lens tube; it is punctured with holes, the varying diameters of which have a definite ratio to focus. The iris diaphragm is also a fixture, and is a system of flat metallic plates or sheaves, which can be readily opened or closed, as desired. This is effected by rotating a circular plate having a milled edge thereon. There is usually an index upon the exterior of the tube intimating up to what point to rotate the plate in order to obtain any particular number of diaphragm, as  $\frac{1}{16}$ ,  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$ , &c. Different makers have their own special arrangements for working these diaphragms, which have now come so largely into use. A useful feature in one lens possessed by the writer is that of a second indicator, designed to show at a glance the time of exposure required. This plate is so adjusted that when the diaphragm has been set to say  $\frac{1}{16}$ , this indication will be opposite the figure, meaning that  $\frac{1}{16}$  requires four times the exposure of full aperture.

Other forms of diaphragms have been devised with the view of proportioning the amount of different rays admitted to the lens, as well as "stopping" the passage of others which could with advantage be dispensed with. Sutton found that by inclining the stop plate at an angle of  $35^\circ$ , the illumination from the foreground was increased in value four times in proportion to that of the sky. Perforated and semi-translucent coloured diaphragms have from time to time been used; they possess the property of conferring a greater degree of softness and detail, without detriment to general sharpness. As more light enters the lens, though in a somewhat modified condition, exposure is thereby accelerated.

Circular openings are usually chosen for diaphragmatic apertures; this is probably done for convenience; but in passing it is proper to observe that any other shape has been proved to answer equally well, so long as the area remains the same.

In referring to rectilinear lenses as possessing a tolerably flat field, it must not be supposed that wide angle lenses of this class are free from spherical aberration; if this were so there would be no necessity for the use of a stop, which is in reality a part of the lens. Wilfred A. French, writing on the limitations of lenses in "Mosaics," 1888, says:—"Given a wide angle lens of standard excellence to cover, say, a  $6\frac{1}{2}$  by  $8\frac{1}{2}$  plate, and including an angle of about  $90^\circ$ . With full aperture, or the largest of a set of revolving stops, this will cover sharply only the central portion of the plate. The bold curves of the glasses com-

posing the lens cause the image-producing rays to be more or less refracted, resulting in what is called spherical aberration, to which is due the imperfect definition at and about the edges of the picture. Now spherical aberration, from which positively no lens is exempt, can be corrected by means of diaphragms . . . The smaller the diaphragm, the greater amount of marginal definition . . . Frequently such a wide-angle lens is used in connection with a smaller plate—a 4 by 5, for instance—which it will cover well with a medium stop, or even with full aperture, but for obvious reasons will be equivalent to a lens embracing only a moderate angle."

From the foregoing extract, and what has been previously brought under notice, it would appear that when instantaneous work is required, an advantage may be gained by employing a lens capable of covering a larger plate than it is intended to use. Then, instead of reducing the aperture by means of a diaphragm, in order to sharpen marginal rays, those portions may be discarded, as they are practically crowded out.

## LAW FOR PHOTOGRAPHERS.

BY S. J. DEBENHAM, SOLICITOR.

### CHAPTER X.—BANKRUPTCY, ETC.

THE last ground of defence to be mentioned is the bankruptcy of the plaintiff or the defendant.

The law, as regards bankruptcy in England, is now administered under the Bankruptcy Act, 1883, 46 and 47 Vic., c. 52, and by s. 44 of this Act the bankrupt is deprived of "the capacity to exercise and to take proceedings for exercising all such powers in, or over, or in respect of property as might have been exercised by the bankrupt for his own benefit at the commencement of his bankruptcy or before his discharge, except the right of nomination to an ecclesiastical benefice."

And by s. 54 (1) unless a trustee is appointed, the Official Receiver shall be the trustee for the purposes of this Act, and immediately on a debtor being adjudged bankrupt, the property of the bankrupt shall vest in the trustee. (2). On the appointment of a trustee the property shall forthwith pass to and rest in the trustee appointed. These sections, it will be observed, refer to "property." Therefore all pecuniary claims are included, except as next mentioned.

Any claim for damages for personal injuries, whether physical or moral—e.g., the effects of an accident, or libel, slander, &c.—are not included.

As regards the bankruptcy of a debtor, the law is as follows:—

The mere adjudication of a man as bankrupt does not release him from his debts. This occurs when he obtains his discharge. The order of discharge releases him from all debts provable in the bankruptcy, with the exception of debts due to the crown, or "from any debt or liability incurred by means of any fraud or fraudulent breach of trust to which he was a party," or from any debt or liability whereof he has obtained forbearance by any fraud to which he was a party (S. 30, Clauses 1 and 2).

By Clause 3, an order of discharge shall be conclusive evidence of the bankruptcy, and of the validity of the proceedings therein, and in any proceedings that may be instituted against a bankrupt who has obtained an order of discharge in respect of any debt from which he has been released by the order, the bankrupt may plead that the cause of action occurred before his discharge, and may give this act and the special matter in evidence.

In order to become a bankrupt, an "act of bankruptcy" must have been committed.

S. 4 of the Act defines the acts of bankruptcy which a debtor may commit.

It is not all debtors, however, who can be adjudicated bankrupts. A foreigner may be made bankrupt if he contracted the debt and committed the act of bankruptcy in



England, or even if the debt was contracted abroad, and he be resident in England; but otherwise the court has no jurisdiction over foreigners.

A married woman may be made bankrupt in respect of her separate property. By the Married Women's Property Act, 1832, it is provided that "every married woman carrying on a trade separately from her husband is in respect of her separate property to be subject to the bankruptcy laws, in the same way as if she were a *feme sole*."

An infant (or minor, as I prefer to call them) cannot be made bankrupt. Vice-Chancellor Bacon decided that he could, but this decision was over-ruled by a later case.

A lunatic may be made bankrupt if found lunatic by inquisition, and a committee of his person and estate duly appointed.

Other persons who were formerly not liable to the bankruptcy laws, or respecting whom there was a doubt, but who are now under its jurisdiction, are Members of Parliament, felons, and undischarged bankrupts.

The Acts of Bankruptcy enumerated in the Act are as follows: I quote from the Act itself.

(a). If in England or elsewhere he (the debtor) makes a conveyance or assignment of his property to a trustee or trustees for the benefit of his creditors generally.

(b). If in England or elsewhere he makes a fraudulent conveyance, gift, delivery, or transfer of his property, or any part thereof.

I must add as a note upon this that such transfer would be void. Such transactions are generally assignments to a creditor in consideration of a present advance by him and an old debt due to him. The test of this being fraudulent, is whether the arrangement was made *bona fide* with the view of enabling the debtor to continue his business, or whether it was a mere scheme by the transferee to obtain payment of an existing debt due to him. The relative extent of the further advance gives a criterion for determining the validity of the arrangement.

(c). If in England or elsewhere he makes any conveyance or transfer of his property or any part thereof, or creates any change thereon which would under this or any other Act be void as a fraudulent preference if he were adjudged bankrupt.

(d). If with intent to defeat or delay his creditors he does any of the following things; namely, departs out of England, or being out of England, remains out of England, or departs from his dwelling-house, or otherwise absents himself, or begins to keep house.

This last offence needs explanation. It means if a man shuts himself up, and excludes himself from society, including his creditors; and denies himself to them persistently.

(e). If execution issued against him has been levied by seizure, and sale of his goods under process in an action in any Court, or in any civil proceeding in the High Court.

This does not extend to executions under process in any matter not being an action in any Court other than the High Court.

(f). If he files in the Court a declaration of his inability to pay his debts, or presents a bankruptcy petition against himself.

(g). If a creditor has obtained a final judgment against him for any amount, and execution thereon not having been stayed, has served on him in England, or by leave of the Court elsewhere, a bankruptcy notice under this Act, requiring him to pay the judgment debt in accordance with the terms of the judgment, or to secure or compound for it to the satisfaction of the creditor or the Court, and he does not, within seven days after service of the notice, in case the service is effected in England, and in case the service is effected elsewhere, then within the time limited in that behalf by the order giving leave to effect the service, either comply with the requirements of the notice, or satisfy the Court that he has a counter claim, set off, or cross demand which equals or exceeds the amount of the

judgment debt, and which he could not set up in the action in which the judgment was obtained.

(h). If the debtor gives notice to any of his creditors that he has suspended, or is about to suspend, payment of his debts.

By s. 6 of the Act, a creditor shall not be entitled to present a bankruptcy petition against a debtor unless the debt owing by the debtor to the petitioning creditor, or if two or more creditors join the aggregate amount of the debts owing to the several petitioning creditors, amounts to fifty pounds, and the debt is liquidated,\* and payable either immediately or at some certain future time, and the debtor is domiciled in England, or within a year before the date of the presentation of the petition has ordinarily resided or had a dwelling house or place of business in England.

If no cause be shown to the contrary, a receiving order is made against the debtor.

A general meeting of his creditors is then summoned and held "for the purpose of considering whether any proposal that may be made for a composition or scheme of arrangement shall be entertained, or whether it is expedient that the debtor shall be adjudged bankrupt, and, generally, as to the mode of dealing with the debtor's property."

On a receiving order being made, the debtor has to furnish a statement of accounts, and submit to examination as to his conduct, dealings, and property.

This must be public, in open court: and these examinations occur daily during the sittings of the Court in London. By the way, I should add that in the country, bankruptcy proceedings are taken in the County Courts.

Of course photographers or other persons in business (or out of it, for that matter) will not have recourse to bankruptcy proceedings against a debtor, if desirous of acting with prudence and economy, unless no other course be open as a remedy for recovery of a debt. It is, to begin with, expensive; a payment of £10 being required by the government on the petition being presented. You are actually very unwilling to "throw good money after bad," as the proverb runs. And there are many ways available to a creditor not generally known, but by means of which I have many times obtained payment of debts that seemed to be lost.

1. There is the garnishee process. This is a much better way to go to work, frequently, than the process of execution by *fi. fa.* (the ordinary seizure of furniture by sheriff or county-court bailiff). If you have reason to believe that your debtor has money claims against other persons (and very often a man does not pay because he cannot get in his own debts), you can, by adopting the garnishee process, compel those debtors (called garnishees) to pay you instead of him.

I have done this in the case of solicitors, whom I had to sue some time ago for an advertising agent.

2. It may happen that your debtor is legatee under a will, or entitled under a settlement to money or stock in the hands of an executor or trustee. You can obtain an order, if your judgment be in the High Court, charging such stock with the amount of your judgment. I, as a member of the County Court Committee of the Incorporated Law Society, sought to have a similar provision made in aid of County Court judgments, and my recommendation was embodied in the report, but it has not been carried into effect in the new County Court Act. Why, I cannot conceive, except, indeed, that many other valuable suggestions we made have been also ignored. The County Court is said to be the poor man's Court. If so, there is the more reason why every facility should be afforded for his obtaining his due, especially after paying the exorbitant County Court fees which he must do to get his judgment.

3. Perhaps the debtor has leasehold or even freehold

\* Computed, ascertained.



property. You can (again, if your judgment be in the High Court) make the judgment a charge upon it, and have the property sold to satisfy your claim.

4. You may also claim the appointment of a receiver of his property.

#### A PHOTOGRAPHIC PUBLISHER'S TALK ABOUT PORTRAITS.

WITH a little judicious questioning, a *Star* reporter the other day got some interesting information, "mainly about people," from a photographic publisher, who, with modesty acquired during an extensive business in ballet girls and bishops, and other retiring celebrities, asked as a favour that his name should not be made public.

"You want to know something about the people I sell, how their photographs are obtained, and to what extent the public buy them?" he said, not at all aghast at our representative's comprehensive query. Taking the last point first—it is an interesting test of a public character's popularity, and a pretty reliable one, too, since admiration in this case means a call upon the pocket—the photographic publisher remarked. "Putting all political feeling aside, I am bound to say that Gladstone is at the top of the poll. He sells far and away the best of all—a hundred to one of any other man, even did in Beaconfield's time, and the demand doesn't fluctuate. Much the most popular man on the Conservative side is Lord Randolph Churchill, whose photograph sold especially well after his Dartford speech."

"And the men who are on neither one side nor the other?" put our reporter, interrogatively.

"Oh, Mr. Chamberlain! Well, curiously enough, he hasn't sold so well now he has become—well—"a gentleman," though he is now kept in West-end shops, where he wasn't kept before. By the way, at some establishments, Gladstone has to be boycotted. The other day a duchess took up, in a West-end stationer's, a portrait of the Grand Old Man; but she no sooner caught a glimpse of the subject, than she contemptuously put it on the counter, face downwards, and accidentally dropped into poetry, remarking:—

"Oh! that wicked old man,  
He is ruining the country as fast as he can!"

There is no demand for the present leader of the House," the man of photographs went on, and impassively added, in answer to an anxious inquiry, "No, there is no photograph of Mr. Smith and Mr. Walter taken together. Among literary men," he continued, "the best demand now is for Rider Haggard. Tennyson stands first among the poets—of course from a business standpoint—Spencer among scientists, Mr. Irving among actors, and Miss Ellen Terry among actresses, excluding, of course, the Gaiety ladies. Of these Phyllis Broughton stands first, and Nellie Farren—who is too seldom taken in character—close after her. Parsons are not in brisk demand. Stopford Brookes is most sought after, because, besides being a popular man, he is good-looking. Of royal photographs—eagerly collected by Americans—the Queen laughing of course, has had a good sale as a curiosity. She was once taken smiling. Do you know how that was? The photographer had kept her Majesty waiting, and, with nervousness, tripped and went sprawling. This so tickled the Queen that she could not keep her countenance during the sitting. The most popular photo of the Princess of Wales—who always sells well—is the one in which she was taken as a doctor of music. A royal photo much sought after, but hard to get, is that of the late Emperor Frederick taken as he appeared at the jubilee celebration here in England. He was only photographed by a Berlin firm, and there has been such a heavy demand in Germany that we have got very few here."

"Of course, all our celebrities are not equally ready to face a camera?"

"Oh, no. Gladstone is very obliging in that way, but some are very difficult to get. The Lord Chief Justice is. While a photographer was at the Law Courts once, taking some of the other judges, a learned brother playfully pulled him towards the camera, saying, 'Come, now, Coleridge, you must be taken.' But his lordship was not to be caught even with his learned brother's chaff. He fled. Another man very reluctant to face the camera is Mr. Henry Irving. He has only been taken twice in character since he has made his name—as Shylock and as the Vicar of Wakefield. The Mephistopheles 'photo' is only of a picture. The 'Olivia' photograph was wrung from him by a caricature—a photograph 'made' up by a too enter-

prising photographer, who succeeded only in enabling a rival to produce an 'authorised version.' Once, before photography was as instantaneous as it is now, an attempt was made to take him as he unsuspectingly left his private house. But he must have got wind of it somehow; at any rate, he baffled the plotters. 'Ouida' has remained more obdurate than even Mr. Irving, and has gone the length of acknowledging, as a reason, that she does not consider herself sufficiently prepossessing. George Eliot was bashful in the same way. The only photograph of her is taken from an old Daguerreotype. Another lady novelist, Miss Braddon, is unapproachable with a camera, and Canon Liddon, with Dr. Pusey's antipathy, won't have a photo taken."

"What about the P.B.'s; are they very shy?"

The only answer was a smile, so on this interesting point our readers are left to form their own opinion. Taking our inquisitive reporter gently off the scent, his informant remarked, "Mrs. Langtry was about the first to be paid for a sitting—none get the fabulous sums often put to their credit. Dorothy Dene gets a royalty, but for the most part these lovely ladies are paid in their own coin—their own photographs. The women who, perhaps, have been most often taken are Mrs. Langtry, Miss Maude Branscombe, and Miss Mary Anderson."

Here the photograph man threw off enough of his modesty to say that the negatives of some of the ladies are "touched up" before the printing is done—wrinkles are taken out, and so on; but what he said on this head shall not, for the sake of the ladies and their photographers, be repeated.

When an obscure man bursts into notoriety there is an interesting and often exciting hunt for his counterfeit presentment. The negative of "No. 1" taken in Volunteer uniform, almost made the fortune of a photographer in a small way of business. The anxiety of the trade now is to get up-to-date photographs of Mr. Walter and Mr. Buckle. The photographic publisher, like a good many more people, makes harvest out of a scandal. He loves, from his own peculiar point of view, to have a divorce case in "camera." Is there such a case on the *tapis*, he must get the photographs of the petitioner, the respondent, and all the co-respondents before they are bashfully bought up by the people they portray, as in some notorious cases they have been. Lady Colville Campbell forbade the sale of her photograph when it became most interesting, because she was in the Divorce Court, and the trade was successfully threatened with the terrors of the very uncertain law on the subject. A beautiful enlargement, however, may now be seen in the window of a Regent Street studio. The Duke of Marlborough is another Divorce Court figure whose portrait is very scarce, and recent inquiries in America after the new Duchess have elicited the answer that she is "not made," as they put it.

Different classes of "photos" go to different markets, the Gaiety ladies, of course, are affectionately collected by the mashers; the commoner kinds of ballet girls in tights are exported in large quantities to the Colonies; and the soldiers in India create a big demand for these photographic samples of "the girls they've left behind them." The crowned heads, as has been stated, are packed off to America.

Among the interesting items our reporter gathered before he bade farewell to the photograph seller and his interesting samples of all sorts and sizes, was that soon we are to have a new photograph of Mr. Gladstone taken in a group in which Professor Drummond figures; that presently we shall be able to have our photographs taken in sheets, gummed and perforated like postage stamps, so that we may the better introduce ourselves by letter; and that the Prince of Wales has earned the undying gratitude of photographic publishers by sending up enormously the sale of Smiths and Sullivan.—*The Star*.

#### COMPOSITION AND CHIAROSCURO.

BURNET'S *Practical Essays on Art* have long been known to artists as, everything considered, the best practical work in England on the subjects with which they deal. These are "Composition in Painting," "Light and Shade in Painting," and "The Education of the Eye." We take the occasion of their republication by Mr. Edward L. Wilson to lay their main points before our readers, attempting, at the same time, to bring them into some logical connection, which Burnet did not try to do. He rather jotted down his thoughts as they occurred, and as the bent of his mind was practical rather than scientific, his work forms but a collection of useful rules to be kept at hand and frequently referred to.



A selection from it, made in the same fashion, would be of doubtful utility, and would give but a poor opinion of the whole. Burnet's book, though not regularly arranged, has its salient points, which become evident to those who study it for some time. His other thoughts naturally group themselves around these. In giving an orderly arrangement to our extracts, therefore, we are but doing what every reader of the work comes, in time, to do for himself, and in this way we hope to introduce the new edition to a new circle of students in the best manner.

Writing of composition, Burnet covers the ground several times over in his opening paragraph, where he says: "Composition is the art of arranging figures or objects so as to adapt them to any particular subject. In composition four requisites are necessary: that the story be well told; that it (the composition or group) 'possess a good general form; that it be capable of receiving a proper effect of light and shade; and that it be susceptible of an agreeable disposition of colour.'"

In reality none but a pedantic painter would separate, even in thought, the disposition of colour, the effect of light and shade, and the general form. Burnet seems to recognize this in the next sentence, where he says: "The form of a composition is best suggested by the subject or design, as the fitness of the adaptation ought to appear to emanate from the circumstances themselves." The practical rule which he derives from this—the most general statement which he makes—may be stated shortly, as follows: The circumstances of the action often oblige us to determine on a particular arrangement, as otherwise we might be obliged to put an emphasis on an insignificant object, or throw an interesting point of the action into shade or into the background. Hence the necessity of attending to the form or the composition from the first. Then, as simple forms are most effective, and are also easiest to manage, he naturally thinks it well to confine his further remarks to those which are simplest. These he considers to be "angular composition," by which he means composition in triangles, and "circular composition." Of each of these forms he gives many examples from the old masters, his remarks on which we reproduce, occasionally adding some of our own. The articles on "Composition in Landscape," which have already appeared in the *Art Amateur*, deal with several other sufficiently simple forms of composition in addition.

Of the many examples which Burnet gives of the use of the diagonal line are one, a very simple and obvious arrangement after Paul Potter, and another, a scarcely less simple, yet very subtle composition of Metz. A remark of Burnet's which applies with especial force to the former, is that many of the great masters, in composition of this angular class, have habitually crowded all of their most interesting material to one side of the diagonal (see article on "Landscape Composition," *passim*), as in Potter's picture of cattle, and the principal lines of the ground and sky lie all in the one direction, and at the one side. This, he well observes, gives a character of richness strictly analogous to that which we often observe in a first sketch, and which is then due to the multiplication of the outlines while the artist was searching for the right one. He also bids his readers remark that the few objects in the upper right-hand portion of the picture, a tree with one almost leafless branch, two birds, and a cloud, seem more important by reason of the open space around them, and, therefore, balance the richly-filled lower part. He is not quite right in that "therefore," as without the objects mentioned there would still be a good enough balance, the rest afforded to the eye by a large open space being almost as pleasant as the occupation given to it elsewhere. It is to be remarked that the branch before spoken of sympathizes with the principal mass in direction, showing that Potter felt that otherwise the composition would be out of balance, in spite of the interesting foreground group. Neither is the composition so merely angular as it appears at first, for the branch and the semi-detached cloud between them enclose the portion of the sky filled with light, and which, with strong contrasting accent furnished by the birds, must in a painting be very interesting.

Similarly, the composition after Metz—an interior, with a man waiting at a table placed near an open window—is not purely angular, or rather, diagonal, although the diagonal line is by far the most important as a line. But it, and all the other horizontal, perpendicular, and diagonal lines with which the picture is filled, are there simply to contrast with the roundness of the features and the flowing hair of the man's head. Burnet, in his remarks, deals principally with the colouring of the picture. "The figure," he says, "is dressed in black and white coming in contact. . . . The black is repeated by the hat, and diffused by

the black marble in the floor; the white is referred to the white marble in the floor, and collected into a mass by the white wall; the red of the carpet (or rather, rug, used as a table-cover), focussed at the light by a stick of wax, is repeated by the back of the chair, and carried up by the outside of the window on the edge of the picture," all of these objects being of various tones of red. Thus it would seem that if concentration is the principle of the composition as to form, diffusion is the same as to colour. It will be seen, too, that the colours are arranged so as to suggest a circular, rather than an angular composition.

Let us turn now to a striking example of circular composition, Raphael's cartoon of Ananias and Sapphira, which is probably known to most of our readers. Burnet calls attention to the simple means by which Raphael, while disposing his figures about a circle in perspective, secures a fine oval form to the whole, and gives the group of the apostles its due importance, although placed in the background. The postures taken by the figures by degrees approach more and more to an erect position as they recede from the foreground, while the apostles alone are drawn up to their full height, and are, further, placed upon a raised dais immediately above the break in the semi-circle caused by the fall of Ananias. He further says, very justly, that Raphael's greatness in composition is shown, not so much by his strict carrying out of so simple a plan, but rather by the ingenuity and knowledge displayed in selecting attitudes that are natural, that grow out of the circumstances of the story, and yet fill their place in his pre-arranged scheme.

We have room to refer to but one of the many examples which Burnet gives to illustrate his hints on the management of light and shade. The engraving is after the Dutch painter, Nolpe. Of this he says that when a dark shadow is carried through the picture, it not only affords an opportunity of giving a breadth of effect, but the receding portion of the sky and perspective of the ground are assisted by their sharpness being swallowed up. But we may add that this is also a good example of the one general rule of composition in masses of dark and light—viz., to carry light against light and dark upon dark for richness, as well as to contrast the darkest with the lightest masses for strength of effect. Both these principles are here carried out in the picture as a whole, and in all its details, making it, from this point of view, a very interesting and instructive composition. An easy experiment suggested by Burnet will further illustrate these principles. Let a light collected into a focus by means of a lens fall obliquely upon a wall—choosing, we should say, one of a rough cast in preference to a smooth wall—you will then have a bright spot of light contrasted with the darkest part of the surface, and the light as it spreads will lose in intensity. Both light and dark will be broken into by the projecting points of the rough-cast catching the light in one case and throwing shadows in the other. By varying the angle of the light, and by introducing various obstacles, one can in this way study all the principal effects of light and shade made use of by painters. Of Burnet's "Essay on the Education of the Eye," we can only say here that it is grounded on intelligent observation, and is more logically consistent than the other portions of his work. It is fully illustrated with diagrams. Artist and amateurs are to be congratulated on the republication of this useful work, which has long been out of print, and has in its earlier editions become rare and costly.—*Art Amateur*.

### Notes.

The *American Journal of Photography* makes some pertinent remarks about the recently concluded Minneapolis Convention, which remarks, if not directly applicable to the past exhibitions of the Photographic Society, at any rate deserve consideration by the management.

Our contemporary says:—"In a collection of the accidental productions of a year, where everything or anything is admitted, there must of necessity be not only a good deal which is indifferent, but also much which is positively bad. Where the chief aim is to cover as



extended a wall space as possible, there is not much scope left to the hanging committee for the exercise of judgment. The reservation of the right to reject any application not up to the standard of excellence may, and often does, cause unpleasant relations between committee and exhibitors; but the exhibition is bettered by the exercise of this discriminating power, and the cause of art furthered. If we are to regard our annual exhibitions as means for educating the photographer, by giving a record of the progress during the year, they fail dismally if no discrimination is used; if merely a display is made of whatever is sent in.

The next exhibition will be notable by the circumstance that no medals are to be awarded, and, maybe, this will lessen the number of exhibits, but perhaps will enhance the quality, as the mere commercialist, who only exhibits that he may obtain a medal, will not be represented.

On the other hand, the photographer who photographs for the love of the work may be expected to exhibit as before, and new workers of this class will probably be attracted by the new regulations.

"Photographing Expresses—an Interview with Mr. Cameron Swan," is the title of an illustrated article in the *Pall Mall Gazette* of Monday last. "The first essential," according to the interviewer's version of Mr. Swan's views, "is to select a spot where the light will fall behind the smoke of the engine. If the light is full on it, the smoke will come out entirely white; but if behind it, there will be shadows intermingled, and the sense of motion will at once be conveyed. Then, again, it is best to take your train in three-quarter view; amongst other advantages, this enables you to photograph the whole length of the train, and to catch the clouds of dust rising behind it. It is often a good plan, too, to select a spot where there is a curve on the line, as the leaning of the engine is an important factor in conveying the impression of speed."

When Mr. Swan told the interviewer that an express train travels about six inches in a hundred-and-twentieth of a second, and that this exposure would generally serve in bright sunshine, he was tolerably near the common experience; but his statement, "I can always 'hit' the train within a foot of any given point"—if, indeed, Mr. Swan really said this to the interviewer—must strike the reader as an extraordinary claim. To be sure of selecting a time within a sixtieth of a second has generally been believed by experts to be beyond the power of humanity.

"Printed in the Most Artistic Way Possible," is what is promised in the case of a series of views which is to constitute the Alpine Portfolio, a series to be issued by the Photographic Printing Company, of 62, Basinghall Street. As an illustration of what the series is to be, we have received a collotype sheet printed on cardboard, and said to be "from a photograph by W. F. Donkin." We feel

sure, however, that Mr. Donkin is not responsible for the sheet thus issued in his name, a sheet in which we have only the lower portion of one of Donkin's Alpine photographs; the upper part—so essential to balancing the effect of the snow—having been clumsily blocked out so as to leave white paper. It is annoying to read that the series is to include photographs by Mrs. Main; as, if her wonderful photographs of Alpine atmospheric effects are marred by the same ruthless hand, they will do much to bring photography into disrepute among artists and persons of culture.

The People's Palace is being turned to account by the opening on Sunday of the capital loan collection of pictures now being exhibited there. The East End public crowd in by hundreds, and their behaviour would satisfy the most bigoted priest. It is needless to say the criticism is of the most original kind. "That's painted by 'and, Maria," we overheard one youth saying to his sweetheart, as they stood in front of Sir John Millais' "Apple Blossoms." "Don't suppose twenty guineas 'ud buy it. It's called 'Apple Blossoms' (reading the label) by Sir John Millais." He had never heard the name of the great painter, and how should he know how to pronounce it? "That's a fox," said one young lady, standing opposite a piece of still life representing the trophies of the chase. "No it aint, you silly!" observed her companion, giggling, "it aint got no tail. It's a 'are." And they strolled away in happy ignorance of the fact that the animal in question was a small deer.

The dangerous proximity of sticks and umbrellas to the pictures when some energetic critic insisted on emphasizing his or her remarks with a vigorous thrust of whatever might happen to be in the hand, made me shudder. But no doubt there will be an improvement in time, when the critics get more accustomed to look at pictures. From pictures they may even come to photographs. We fancy a photographic loan exhibition could be easily got up at the People's Palace. With the hosts of amateurs roaming about the country, there ought to be no lack of material, and next to the pleasure of taking a photograph comes the pleasure of seeing it hung in an exhibition. So far as the East End working classes are concerned, we do not hesitate to say that to them a photographic exhibition would seem more wonderful than even a collection of paintings. The contents of the East End photographer's show case, and the sixpenny ferrotype taken in Epping Forest by the strolling operator, form the limits of their knowledge of the art, and an exhibition of good work would be a perfect revelation. Could not something of the kind be arranged?

Society journals make some wonderful discoveries. One of them says that a prominent New York politician has arrived in London to procure photographs of English, French, and German workmen. His object will be "to obtain the most miserable looking specimens," and these photographs, having been multiplied, will be scattered broadcast throughout the States to illustrate Mr.



Blaine's idea of the sad condition of European labourers, and especially where Fair Trade exists. It is not quite clear, from the wording of the paragraph, whether the "miserable looking specimens" refer to the photographs, or to the workmen; but it is not of much consequence, as the whole thing is probably a concoction.

The services of the photographer are to be dispensed with at the Beauty Show to be held at Spa, on September 15th. On the last occasion the decision was arrived at from the contemplation of the photographs of the competitors. But this plan does not appear to have given satisfaction, and the ladies must present themselves in person. We are not surprised at the judges preferring to see the originals rather than the photographic copies; at the same time, it would be interesting to know whether the alteration is due to any feeling that photography is unreliable. The photographers who took the beauties on the last occasion were certainly placed in an embarrassing position. If they sent out the photographs untouched, they would not please the sitters; if, on the other hand, they retouched the negative, they would not satisfy the judges. It may be that the latter had an opportunity of seeing the lady after they had awarded the prize to her photograph, and were disappointed with the result. Anyway, they have resolved this time to adopt the contrary course, and so the successful ladies are to be photographed after they have received their awards.

The *Court Journal*, referring to the recent case of a Custom House officer insisting upon opening a box of negatives belonging to an amateur who had just arrived at Norway, says that under the Customs Laws Consolidation Act the amateur photographer had a right to demand to be taken before a justice or before the collector or superior officer of Customs and explain his case, so that there is no need for other amateur photographers in a similar case to be similarly treated. This may be, but we fancy that until some special instructions have been issued to Custom House officers with respect to amateur photographers, the remedy will not be of much use. A demand to be taken before a superior officer will not prevent a stubborn official from satisfying himself what the suspected parcel contains.

It is to be hoped that our Bulgarian *confrère*—we are really somewhat timorous of attempting to write down his name in cold blood—who up to last Thursday was a prisoner in the hands of a band of brigands belonging to his interesting but somewhat unsafe country, will lose no time in making public his adventures. As the first photographer, probably, who was ever taken by the picturesque rufians he went out to "take," his experiences should be as novel as they are romantic; and it is not photographic circles only, we think, which would evince an interest in the account he must be now in a position to furnish of his life amongst the bandits.

At present, thanks to the tantalising enigma of Baron Reuter's telegram, we are wholly left in the dark as to no

end of details which we are naturally anxious to know. All we really know is that M. Stojavaloff—this, if we mistake not, is something akin to his name—is a free man; but as to whether he was duly ransomed, or was given up under protest by his captors, or voluntarily surrendered as a prisoner not to be kept at any price, we remain wholly uninformed.

Thus the to our readers most interesting question as to the value in sterling currency of a photographer is still left unanswered. We know, it is true, what the Bulgarian brigands appraised his value to be when they first caught him, but the worth of a man, be he a photographer or a funnambulist, or a flautist, or a phleboto-mist, or what not, is clearly not what is asked for him, but what he will fetch. Will M. Stojavaloff, therefore, kindly let us know, as soon as he conveniently can, what he fetched; or, in case he was released unransomed, will he be obliging enough to explain why his captors so quickly altered their opinion as to his value?

A negative of the interior of a real brigand's cave would be worth its weight in gold, and photographs of it would sell even faster than the *cartes* of the latest champion pugilist, or the most recent theatrical favourite of the period. If the Bulgarian Government were wise, indeed, in their generation, they would cease their ineffectual attempts to hunt down the brigands, and would authorise some enterprising Barnum of the period to open negotiations with the bandit chief, with a view to transporting him and his band—only, of course, in its innocent and Pickwickian sense—and all their belongings to this country, for exhibition at the Alexandra Palace—say when Professor Baldwin has killed himself—or at the Aquarium, or what used to be the Wild West. By the assistance of M. Stojavaloff a sufficiently realistic cave could be soon constructed, and we venture to predict that these real brigands would then succeed in drawing all London to see them. But this, we presume, is not likely to come to pass, and there is, therefore, all the more reason for the released Bulgarian photographer to publish his descriptive volume as soon as possible.

#### DEVELOPMENT WITH HYDROQUINONE.

BY HERMANN E. GUNTHER.

THE hydroquinone developer becomes more and more a general favourite in Germany, and many of our first operators, who used the iron developer till now, have adopted this new substance, fully appreciating its great advantages.

E. Kiewning, a well-known manufacturer of dry plates, recommends the following formula:—

a.—Hydroquinone	...	...	2 grammes
Alcohol, 40 per cent.	...	...	20 cc.
Sulphite of soda, 25 per cent.	...	...	...
solution	...	...	20 cc.
b.—Carbonate of soda	...	...	250 grammes
Water	...	...	1000 cc.

The alcohol required for the dissolution of the hydroquinone should, however, be bought of the strength of 96 to 98 per cent., and diluted with water to 40 per cent., to



be sure that it is free from empyreumatic substances, for, if the latter be not the case, the developing solution undoubtedly would fog the plate. After the alcohol has been diluted and the hydroquinone dissolved, the quantity of the solution is doubled by addition of the 25 per cent. sulphite of soda solution. The hydroquinone solution keeps for a long time. For a plate of 13 by 18 cm., take:—

Solution <i>a</i> ... ..	10 cc.
Solution <i>b</i> ... ..	30 cc.

This composition gives very fine, softly modulated negatives, and is energetic to the last drop. To increase the power of the developer, potassium bromide may be added in the usual homœopathic quantity, but for certain purposes it will be better to reduce the quantity of the sulphite of soda in the hydroquinone solution, as the development will then be more uniform, and more convenient than by using bromide of potassium. So the following composition will give very good results in the case of portraits which have been taken with highly sensitive gelatine plates, which, if developed in the usual way, would give only a grey and monotonous negative:—

Hydroquinone, dissolved ... ..	2 grammes
Alcohol of 40 per cent. ... ..	20 c.c.
Sulphite of soda ... ..	2 grammes
Water ... ..	20 c.c.

For a plate of 13 by 18 cm. we take:—

Hydroquinone solution ... ..	10 c.c.
Carbonate of soda solution 25:100 ... ..	30 c.c.

Only 2 grammes of sulphite of soda are contained in this solution, whilst in the previous given composition, to the equal quantity of solution 5 grammes of sulphite of soda are employed. If in this form the developer should work too hard, as much of a 10 per cent. solution of sulphite of soda is cautiously added to the hydroquinone solution as the case requires. Also a very good composition, but in its action not quite as quick as the previous one, is the following:—

<i>a.</i> —Hydroquinone ... ..	10 grammes
Sulphite of soda ... ..	50 "
Water ... ..	500 c.c.
<i>b.</i> —Carbonate of potassium ... ..	50 grammes
Water ... ..	400 c.c.

If carbonate of soda is used instead of the carbonate of potassium, the negatives become more brilliant, and more characteristic. In the case of under-exposure the quantity of the hydroquinone is reduced, and for a plate of 13 by 18 cm. taken only:—

Hydroquinone solution ... ..	5 c.c.
Carbonate of soda solution ... ..	30 "

The plate is treated with this solution until all the details have appeared, then the development is completed with a stronger normal solution. According to Adolf Kleffel, Fr. Mueller, the well-known photographer of Munich, has adopted the following composition:—

1.—Distilled water... ..	2,500 c.c.
Sulphite of soda ... ..	250 grammes
Carbonate of potassium ... ..	250 "
And,	
2.—Hydroquinone... ..	50 grammes
Distilled water ... ..	250 c.c.
Alcohol ... ..	250 "

For use, 10 cc. of the hydroquinone solutions are mixed with 100 c.c. of solution No. 1. This developer gives very fine negatives, even in the case of over-exposure. Kleffel has observed that in fixing the plates, though they were thoroughly washed before, a granular deposit was soon formed, which stuck so fast to the following plates that it could not be removed by rubbing with the hand. Then the fixing bath became more and more muddy, and after

two days it was entirely black and useless. This deposit, which is undoubtedly formed by rests of the developer coming in contact with the hypo bath, may be easily prevented by using between developing and fixing the plates an acid alum bath, consisting of:—

Alum... ..	10 parts
Water ... ..	100 "
Hydrochloric acid ... ..	(1:12) 4 "

Or, by adding directly to the fixing bath a little alum and hydrochloric acid, or citric acid. It will then be found that the hypo bath keeps for a long time quite clear.

Paul Baltin has published a formula for preparing the hydroquinone developer as a one-solution developer of very good keeping qualities; it consists of the following:—To 900 c.c. of water 5 grammes of hydroquinone are added, and entirely dissolved by shaking. Then 40 grammes of sulphite of soda are added, and dissolved in the same way; finally, the same is done with 75 grammes of potash. The developer is then ready, and keeps clear even without stoppering the glass bottle. If the developer is prepared in the same way, but using only half the quantity of water, then it works but slowly and flat, and it has to be diluted, to obtain better results. It is not necessary to use hot or distilled water in preparing the developer, aqueduct water being quite sufficient; if by employing the latter a very faintly brownish or reddish colour of the solution should be formed, this will be of no consequence.

It would, perhaps, be better, in preparing the developer, to dissolve at first the sulphite of soda, and then the hydroquinone; the solution keeps then quite clear. If, just before using the developer, about 5 per cent. of a 40 per cent. solution of caustic potash are added to it, this acts as an exceedingly powerful accelerator, and the solution remains quite clear. The same is the case if, in the above given formula, the potash is simply replaced by caustic potash.

The use of caustic potash has, however, the drawback that in hot weather the films treated with it entirely loose the plates and float in the fixing bath. As a perfectly certain remedy has proved a rather concentrated solution of common salt, in which the plates are immersed after development, without washing them, for a period of about five to ten minutes.

#### SCIENTIFIC DEVELOPMENT OF THE PHOTOGRAPHIC IMAGE.

BY JOHN CARBUTT (PHILADELPHIA).\*

At the solicitation of our President, for a practical paper to be read at the Convention, I have selected the subject, "Development of the Photographic Image." I have been impressed, when examining the work of different photographers, that much of it would have been greatly improved had the plate had treatment in developing suited to the subject and lighting. There are photographers who make the study of the developing of a plate of as much importance as the lighting of the subject, and it is by such that we find produced the highest results in photography.

You may take the most perfect plate sent out by the dry plate maker, and religiously follow his formula for development, but unless your own judgment is largely made use of in so preparing the developer as to suit the subject, the most mediocre result may be produced. Strength of alkaline solution and temperature at time of using are largely the controlling factors to a successfully developed negative. The photographer may arrange the most artistic pose and lighting, and produce but a poor result photographically by unskilful use of his developer, and he will most likely blame the plate maker for the poor quality of his negative.

The fixed alkalies, potassium carbonate and soda carbonate, in combination with soda sulphite, are the alkalies most in use by American photographers in forming a pyro developer. Of the two alkalies, the soda carbonate has my preference, especially in summer time. By compounding a stock alkaline solution in the

\* Read before the Minneapolis Convention.



following manner, it becomes a matter of extreme simplicity to form a developer suited to the lighting and subject in hand.

Take of—

Soda sulphite crystal	...	...	...	2 parts
Soda carbonate crystal	...	...	...	2 "
Water (warm)	...	...	...	10 "

This when cooled to a temperature from 60 to 65 degrees F. will be found to test 20 degrees with Baume's hydrometer. By dilution with water to one of the three following strengths a developer can be formed more suitable to the subject than by using one strength of alkali, as is commonly done.

1 part stock to	5 parts water weighs	...	3½ degrees B
1 "	8 "	...	2 "
1 "	10 "	...	1½ "

The 1 to 10 may be considered a weak solution, the 1 to 5 strong, and the 1 to 3 medium. To any one of these may be added pyro dry or in solution, in the proportion of from 1 to 3 grains to the ounce. It will be well to bear in mind that the slower and more vigorous working plate requires a developer stronger in alkali and weaker in pyro, and the reverse for a highly sensitive plate. For a subject in light-coloured drapery, I recommend the 1 to 10 alkali solution with from 1½ grains of dry pyro or ½ dram of 1 in 16 pyro solution, and 1 or 2 drops 10 per cent. solution of bromide of soda or potassium, or bromide of ammonia. For general run of subject having dark or mixed colours, the 1 to 3 alkali with from 1½ to 2½ grains of pyro to the ounce forms a generally useful developer. For dark colours in drapery and complexions, the 1 to 5 alkali will be most serviceable.

In conclusion, I would say that a full exposure, a weak alkali, and a little bromide to the pyro are conducive to well-modulated negatives, whereas a strong alkaline solution gives a flat and grey negative, lacking good printing qualities.

### THE CAMERA AND THE PENCIL.

THE spirit which animates modern art would find its most appropriate symbol in the photographic camera, since realism is not only dominant in painting, but is also the controlling principle in fiction and poetry.

We have come to look at nature face to face, no longer through a glass darkly; finding in the commonest object, in the humblest character, thoughts rich in beauty, strong in truth, and of high moral purpose. Without "o'erstepping the modesty of nature," we create new scenes, call forth unexpected manifestations, and discover likenesses and difference in things which delight the imagination or touch the heart. Shakespeare tells us his mistress's eyes were "nothing like the sun," and Richardson acknowledged that Clarissa's neck was "not so white as the lace upon it, whatever poets might say if they had been called upon to describe it."

Artists may cast reproach upon photography for its literal rendering of facts, for the line for line translation of a scene in nature; but in their heart of hearts they take the greatest delight in these actual transcripts. Some years ago, painters were very confident that photography had no claim to a place in art; nowadays, they are not so sure of it; the fact is, they are joining the ranks of the photographers, and very thankful we are, for our photographic art is bettered thereby. They not only speak kindly of photographic pictures, but often become enthusiastic over the beauties of the camera, and even covet a simple portrait or landscape for its beauty of expression or delicacy of tone.

We remember reading a paragraph in Goethe's "Sorrows of Werther," which comes in very appropriately to show how an avowed idealist does actually delight in the actual and commonplace things of nature. "About a league from the town is a place called Walheim. It is very agreeably situated on the side of a hill. From one of the paths which lead out of the village you have a view of the whole country, and there is a good old woman who sells wine and coffee there; but better than all this are two lime trees before the church, which spread their branches over a little green surrounded by barns and cottages. I have seen few places more retired and peaceful. I send for a chair and table from the old woman, and there I drink my coffee and read Homer. It was by an accident that I discovered this place one fine afternoon. All was perfect stillness—everybody was in the fields except a little boy, about four years old, who was sitting on the ground and holding between his knees a child of about six months. He pressed it to his bosom with his

little arms, which made a sort of great chair for it, and, notwithstanding the vivacity which sparkled in his eyes, he sat perfectly still. Quite delighted with the scene, I sat down on a plough opposite, and had great pleasure in drawing this little picture of brotherly love and tenderness. I added a bit of the hedge, the barn door, and some broken cart wheels, without any regard to order, just as they happened to lie, and, in about an hour, I found that I had made a drawing of great expression and very correct design, without having put in anything of my own. This confirmed me in the resolution that I had made before, only to copy nature for the future. Nature is inexhaustible, and alone forms the greatest masters."

Nothing in the whole range of art is perhaps so difficult to depict in their true relations as the sea and sky. The harmony is so exquisite in the whole scale from high to low, that the introduction of the slightest discordant element jars upon the feelings of those whose souls are tuned to its concord. The sea, infinite in variety of changing forms and hues, unwearied in its manifestations of grace, unconquerable in power and majesty, eludes the subtle touch of the most skilful painter to catch one phase of its lovely inconstancy, any one form of its fury. Even in its gentler moods, when, with soft murmurings, it sports with the beached margin of the shore, so mockingly transient is the exquisite modelling of the little waves, that the eye catches only furtive gleams of the beauty. And so of the sky. The constant play of an exhaustless energy evolves from its bosom form after form of loveliness, fleecy masses of wind-fretted clouds, soft filaments of fine spun vapour interpenetrated with changing lights, multitudes of dense white shapes wandering in thick flocks,

"Shepherded by the slow, unwilling wind."

We think it may be safely said that photography has taught us more of the sea's phases than centuries of untiring observations. We know full well the limitations of photography, and the pre-eminence of painting; but let us candidly acknowledge the great services it has rendered to art by treasuring up those transient shapes of beauty which the pencil despairs to record.

The old masters, even the Venetian painters, who lived upon the bosom of the sea, give us only now and then crude little patches of green or blue, evidently intended for sea, because they place little ships upon the patches, as much as to say, "this is the sea." It was left to modern art, almost the present century, to study the volume of the moving waters for its own beauty, and not as a mere conventional background for human motives. Turner comes very near nature. He gives the impression of mass and volubility, of transparency and mobility. He shows us the lapping and curling of the waves, with their lace-like traceries, the intermingling of light and shade broken up by the little surges and ripples; but even Turner fails to catch that perfect freedom in the flow, that rollic at the top of the wave when the spray seems hardly to know which to obey, the bidding of the wind or the impatient volume of the main wave striving to gain the shore.

To judge from the average paintings of sea and sky, what a vague idea people have of what a cloud or a wave is like. A blot of white upon a scutcheon of uniform blue is passed off as the work of

"Heaven's profoundest azure."

A rolling, twisting, convolution of green, with dashes of white, passes current for the flow of Old Ocean. These conventional ideas so blind men to the truth of clouds and waves, that when an artist who has looked at nature with unfiled eyes puts upon his canvas his conceptions, he is denounced by the critics for his presumption. And so when the camera gives us the sea or sky with nature's own image and superscription, we fail to render tribute to whom tribute is due.

We are glad to give our readers a most charming picture of sea and sky, entitled New York Harbour—the production of the Photo-Gravure Company, of New York. The distribution of light and shade is well managed, and the arrangement of the masses of dark and light is very effective. The repetition of the dark portion in a minor key, while giving balance to the picture, adds much to its harmony.—*American Journal of Photography.*

### Patent Intelligence.

#### Applications for Letters Patent.

12,006. JAMES EDWARD ANDERSON, and PERKEN, SON, and RAYMENT, 34, Southampton Buildings, London, W.C., for



"Improvements in Gas Supply Regulating Apparatus for Magic Lanterns and other Purposes."—August 20th, 1888.

12,086. HARRY WHITFIELD, 68, Broad Street, Birmingham, for "Improvements in Holders, Clips, or Easels for Photographs, Mirrors, Photograph Frames, Cards, and other articles."—August 22nd, 1888.

12,133. JOEL CADBURY, and WILLIAM HENRY RICHARDS, 6, Livery Street, Birmingham, for "Additions to, or the Ornamentation of, Photographic and other Frames, Stands, Brackets, and other Supports."—August 23rd, 1888.

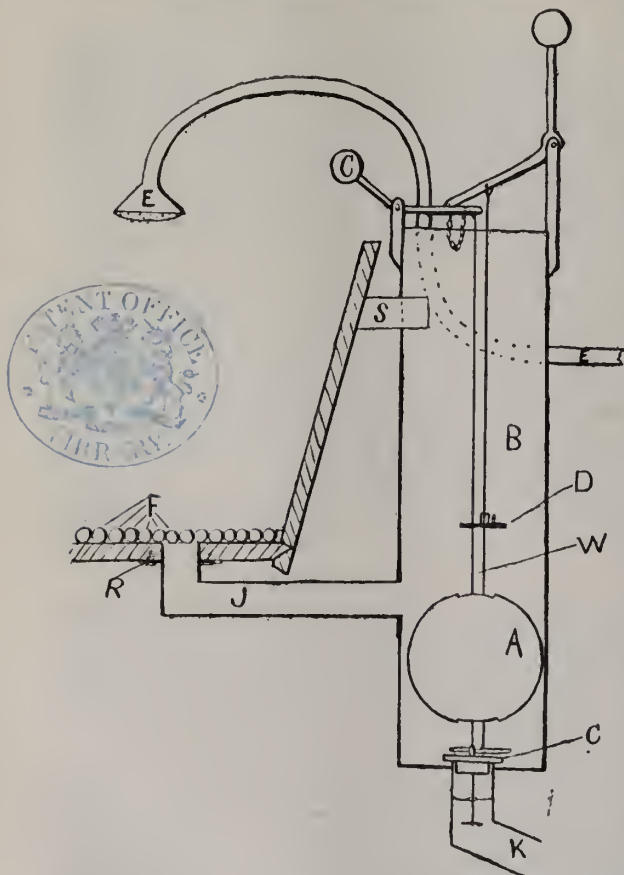
12,181. ARTHUR RAYMENT, of the firm of Perken, Son, and Rayment, 34, Southampton Buildings, London, W.C., for "Improvements in Shutters for Photographic Cameras."—August 2nd, 1888.

#### Specifications Published during the Week.

11,454. EDWIN HENRY BRINDLEY LYNE, 54, London Street, Fitzroy Square, London, W. for "Improved Apparatus for Washing Photographic Prints."—Dated 23rd August, 1887.

A pipe and rose to conduct a spray on the prints until the tank is as full of water as wanted, being regulated by regulator which ball raises, which lifts self-acting plug, which runs water off, leaving prints on marbles that cover bottom of tank, when, as ball lowers, it replaces plug, can be fitted on anything in present use, as tubs, &c.

A. Hollow ball with hole through centre. E. Rose and pipe to conduct spray on prints. F. Marbles at bottom of tank, tub, &c. B. Round tank to fix on tubs, &c. "in present use" by



flange R. and pieces S. C. Counterweighted plug. D. Regulator, to raise higher or lower as required on wire W. J. Inlet from tub to tank B. K. Outlet from tank.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—Hollow ball with hole through centre; rose and pipe for spray; marbles at bottom of tub, &c.; counterweighted plug; inlet to tank from tub, &c.; regulator with chain attachment.

9283. THOMAS WILLIAM HARVEY, of 463, Main Street, in Orange New Jersey, United States of America, Physician, for "Improvements in Portable Photographic Developing Boxes."—Dated June 26th, 1888.

This relates to a portable, water-tight photographic developing box, made partly of a tinted glass impervious to actinic light, and provided with a tight-fitting removable cover, and with pipe connections for introducing into and withdrawing from the box liquids used in developing a sensitized plate, which has previously been exposed in a camera, and after removal therefrom placed in the developing box.

It permits the operator to conduct the developing process in white light, or even in sunlight, under the best conditions for observation. It dispenses with the large closets and chambers, and hence diminishes the cost of appliances.

The arrangement consists of a shallow box, slightly exceeding in its length and width the dimensions of the plates for which it is intended to be used. It consists of a substantial rectangular frame, in a portion of which there is formed a receiving chamber, having internal perforations, and connected with a liquid supply-pipe. The liquids used in the developing process are supplied to chamber, through pipe, and discharged therefrom through perforations, simultaneously upon different portions of the photographic plate, which is held in position by having its sides entered into grooves, formed on the interior of the box.

The top and bottom of the box are each formed of a pane of suitably tinted glass, and each pane is secured in the box so as to make a water-tight joint therewith. The pane of glass at the top and bottom of the box are intended to be transparent, but must be so tinted as to exclude actinic light rays from the interior of the box. For this purpose ruby or yellow coloured glass may be employed: or, what is better still, a pane of glass ruby tinted on one side and yellow tinted on the other.

One end of the frame is provided with a slot, the extremities of which coincide in alignment with the grooves, and this end is provided with two lateral lugs having holes for receiving the clamping screws, by means of which the cover is clamped to the frame. The bearing face of the cover is provided with a packing strip of rubber or other elastic material, so that the cover, when clamped in place, will make a water-tight joint with the frame, and securely close slot after the plate has been introduced into the box.

The supply-pipe is preferably provided with a stop-cock, and, for abundant caution, in order to prevent the entrance of white light through the pipe into the box, it is sinuously curved, as shown.

A flexible coupling-pipe is connected to pipe, and to it is applied the nozzle of an ordinary bulb syringe.

An air-passage or pipe, also sinuously curved and provided with a stop-cock, is inserted through the frame, so that when the cock is opened the pipe will serve as an outlet for the air expelled from the interior of the box when liquids are injected into it, and will also serve to let air into the box when liquid is withdrawn therefrom through pipe.

It will of course be understood that the developing-box may be varied in its shape and in the manner of its mechanical construction, without departing from the invention, the essential requirements of which are, that the box shall have an opening for the introduction therein of the plate to be developed; a movable cover, by means of which said opening can be closed water-tight; a transparent portion which permits the photographic plate within the box to be visually observed during the progress of the developing operation, but which will not admit into the interior of the box, light which is actinic; and finally, means for introducing into and withdrawing therefrom the developing liquids.

In practice the removal of a plate from the camera, in which it has been exposed, to the box, may be accomplished by aid of a changing-box or bag.

After the plate has been introduced in the box and the cover thereof fastened in place, the operation of developing and fixing the picture is performed by the use of the usual liquids, without any further precaution against the exposure of the photographic plate to white light.

By filling the bulb-syringe with liquid, and connecting its nozzle with the flexible tube and compressing the bulb, such liquid is readily injected into the interior of the box and discharged in jets, over the surface of the sensitized plate therein; the air-cock being open during this operation. By then closing the air-cock and removing the pressure from the bulb, the liquid in the box is readily withdrawn therefrom.



The tinted glass may be used for the top only of the box, in which case the developing of the picture can be observed by light reflected from the surface of the photographic plate. It is, however, manifestly preferable to make both the top and bottom of the box transparent, so that the box can be held up toward the light, and the progress of the developing operation rendered plainly visible by light which shines through the photographic plate. If preferred, a receptacle made entirely of glass, impervious to actinic light, may be used instead of the frame with the glass panes.

The claims are:—

1. A portable photographic developing-box, made partly of tinted glass impervious to actinic light, and provided with a tight-fitting removable cover and with pipe connections for introducing into and withdrawing from the box the liquids used in developing a picture upon a sensitized plate, which has previously been exposed in a camera, and after removal therefrom placed in the developing-box, substantially as set forth.

2. A photographic developing box, partly made of transparent tinted glass and adapted to contain a photographic plate, and provided with an internal receiving chamber having perforations in its inner wall, for the purpose of effecting the simultaneous discharge upon different portions of the plate under treatment of liquid introduced into the said receiving chamber by means of a suitable pipe connected therewith, substantially as set forth.

3. A photographic developing box made partly of tinted glass, in combination with a pipe for introducing into and withdrawing from the interior of said box the liquid employed in the developing process, and an air passage or pipe for letting air escape from the box when liquid is injected into it, and for permitting air to enter the box when the liquid previously therein contained is withdrawn from it, substantially as set forth.

4. A photographic developing box, made partly of tinted glass and provided with an opening for permitting the introduction into the box of a photographic plate, in combination with a removable cover faced with an elastic material, and a fastening for said cover for securing it to the box, and closing the said opening water-tight after said photographic plate has been introduced into the box, substantially as set forth.

5. The herein described photographic developing box, made partly of tinted glass, as and for the purpose described, in combination with the liquid supply-pipe, provided with the stop-cock and the air pipe, provided with the stop-cock as set forth.

Patents stated in the Official Journal to have become Void by Non-payment of Duty. Non-payment of Fourth Year's Fee.

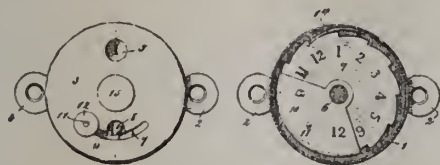
7,678 of 1884. A. MACDONALD and Another.—Washing Photographs, &c.

7,792 of 1884. W. HEATH.—Obtaining photographic pictures.

#### Patents Granted in America.

387,841. JOHN W. ALDERICE, Waterbury, Conn., for "Photographic-Print Register."—Filed March 26th, 1888. Serial No. 268,494. (No model).

Claim.—1. A register comprising a central stud, an index-plate journaled thereon, which denotes the number of prints required, a register-plate carried by the central stud, having ratchet-teeth at its edge and numbers which count the print as made, and a spring engaging the ratchet-teeth to hold it against



backward movement, and by friction thereon to hold it against forward movement, except when the central stud is rotated.

2. A register comprising a back plate having ears for attachment in place, a face-plate having a flange to enclose the operative part which is attached to the back plate, openings 5 and 8 in the face-plate, a central stud journaled in the two plates, an index-plate journaled on the central stud and having numbers showing at the opening 8, for the purpose set forth, and a register-plate carried by the central stud and having numbers showing at the opening 5, as and for the purpose set forth.

3. A register comprising a face-plate having openings 5 and 8 and a curved slot 7, a central stud, an index-plate having numbers showing at opening 8, a stud passing through the slot and a thumb-nut, whereby it is locked after adjustment, a register-plate carried by the central stud and having numbers showing through the opening 5, ratchet-teeth at its edge, a spring engaging said ratchet-teeth, and a knob on the central stud for operating the register-plate.

## Correspondence.

### WILSON'S HAND-BOOK.

SIR,—Although it is not an altogether unusual spectacle to see one author "going for" another author, yet it is generally done anonymously, and in the pleasant form of a "review," and we make no suggestion of the opinion being uncharitable or unwarrantable. We are profoundly impressed by the mysterious power of anonymity, and the opinion (of little value, perhaps, in itself) is accepted unquestioned. Let a man, however, sign his name to the article, and though his opinions be perfectly just, and expressed in the most guarded and kindly fashion, he is accused at once of all sorts of sinister and unworthy motives.

Having very carefully read Mr. Heighway's remarks on the retouching chapter of Mr. Wilson's book, with the additional extracts editorially given (which, I presume, make up the entire chapter), I am struck with the extreme moderation of Mr. Heighway's criticism. He puts it that there is little or nothing of value, where he might well have said there was absolutely nothing at all in the chapter, touching on retouching.

Mr. Wilson's portion we may dismiss as mere padding, for there is no hint whatever of practical usefulness in it. When we turn to the extracts, what do we find? (1) A very long article on coloured collodion of no practical utility; (2) an exploded theory on so-called "chemical retouching"; (3) some remarks on opaque defects of little or no practical value; (4) trivial hints on the use of pumice-stone for cleaning the glass side of a negative; (5) some rather silly remarks on the province of the retoucher; (6) hints on spotting prints—somewhat out of place here; (7) numbering negatives with the diamond; (8) a plan for making drawings by scratching with needle-points; and (9) removal of varnish.

Absolutely nothing on the subject of retouching!

I take it that books on photographic subjects are purchased for the hints they are supposed to contain likely to be of practical service to workers in the art, and in the measure of their usefulness they are valuable; but if they contain useless and silly matter they are mischievous. I, for one, would not complain because the "author" merely collects the opinions of others, but these collections should have some distinct practical usefulness, or I hold myself wronged, and feel that my money has been taken from me by something very like false pretences.

By this standard, judging of the chapter on retouching, I am assured that Mr. Heighway's protest was fully justified; and not only so, but that recognising the poverty of the book, he performed a duty to his fellow-craftsmen in protesting against such weak "authorship."

Apologizing for occupying so much space,—I am, sir, yours faithfully,

A. STREETER.

Terminus Road, Eastbourne.

### DETERIORATION OF PLATES.

SIR,—The set of rambling papers on my travels through Japan last year were so tardy in making their appearance, that I long ago concluded that they were either lost, or were not considered worth publication. Had it not been for this I should have written to you before to correct the statement which is made in the first of the papers referred to, with regard to certain San Francisco plates—



or, rather, to correct the impression likely to be caused by my remarks. I spoke of some plates that were undoubtedly very bad, and expressed the opinion that they had probably been sent away in the condition in which I found them with the knowledge of the maker, and I spoke merely of the bare possibility that they had deteriorated by time. It is true that I avoided the mention of any name, but there are not many makers of plates in San Francisco—indeed, there may be only one so far as I know. I therefore wish to state that the result of a year's experience of plates in this country is, that I am now of the opinion that it is more than probable that the faults in the plates were all due to the sea voyage across the Pacific, and to keeping for a few months in Tokio. The difference in the matter of keeping in plates here and at home is very remarkable, and decidedly instructive. I do not think that the average time that plates can be relied on to keep here is more than about six months, or at the very most a year, and the sea voyage of those that are imported must be included in this time.

I brought with me, or had sent after me, a good many plates that I had made at home a few months before I left England. These were all that could be desired for about six months after I was in this country. At the end of that time they began to show a falling off, and now they are absolutely useless. Some of the first plates made by me in this country about eight months ago are beginning to show the same falling off.

The falling always shows itself in the same way. A surface fog appears. This increases as the plates are kept, and as it intensifies, insensitive spots, with irregular outlines, make their appearance. These increase both in number and size, until at last, if a plate which has not been exposed to light is developed, the whole surface is mottled over. There is generally also, if the alkaline developer has been used, the well-known iridescent appearance of the surface when looked at by reflected light, the iridescence being strongest at the edges.

I have observed these defects in six different well-known European and American brands of plates, none of which had been for a whole year in this country, and in negative paper also. I attribute it to the combined heat and damp. It is not to be expected that, with the thermometer above 90° in the shade, and the atmosphere at about the saturation point, plates—or, for the matter of that, anything that is subject to any change under atmospheric influence—will keep very well.—I am, yours, &c., W. K. BURTON.

*Imperial University, Tokio, Japan, July 20th, 1888.*

P.S.—I ought to mention that the plate maker I have referred to, having heard of my failure with his plates, sent me a sample of those he was making at the time, that I used these immediately on receiving them, and found them to be most satisfactory in every way. As I have now good, not evil, to say of the plates, I may as well as not give the name; it is "Passavant."

## Proceedings of Societies.

### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

At the technical meeting of this Society, held on the 28th inst., the chair was occupied by J. TRAILL TAYLOR.

FRIESE GREENE said that he had found a curious effect of a photograph produced upon a gelatino-bromide plate from the human eye. He had experimented by looking steadily at an arc electric light of 2,000 candle power for a period of fifteen seconds at a distance of three feet from the arc. He then held a sensitive plate (gelatino-bromide of silver) close to his eye for two minutes, and submitted the plate to the action of a developer, and found an image consisting of an intense mark in the centre with a surrounding transparent place, and then a circular mark again. To make sure that this appearance was due to the exposure of the plate to the eye, and not to any accidental extraneous cause, he had repeated the experiment with the like result, and produced both plates for the inspection of the members.

W. E. DEBENHAM enquired whether F. Greene had read the late Walter Woodbury's experience in looking at an arc light.

F. GREENE had not done so; the experiment was quite original with him.

W. E. DEBENHAM continued that Woodbury's sight had been nearly destroyed by looking fixedly at an arc light, and he thought that that fact should be known by any who were contemplating experiments in that direction.

The CHAIRMAN said that his own sight had been injured for some years by looking at a solar kaleidoscope. He consulted Mr. Wenham at the time, who told him that his own eyesight had also been injured in the same way, and he did not expect to recover it. In the case of the chairman, however, after some years, the spots of insensitiveness on the retina caused by the image of the sun disappeared; but great caution should be observed in any such experiment.

T. BOLAS suggested that in a repetition of the experiment, F. Greene should station someone in the dark-room where his eyes would be accustomed to the absence of light, and that immediately after F. Greene had looked at the arc, the observer in the dark-room should notice whether there was any luminous effect given out by the eye corresponding with the markings on the plates exhibited.

F. GREENE then narrated an experiment that he had made in spectrum analysis, which he proposed to repeat before the members. He had taken a commercial bromide of silver plate, and covered it with a coating of collodion containing chloride of silver with nitrate in excess. He had then exposed this to the light of the spectrum, and found an image of the yellow, but not of the green. There was also a strong impression in the blue, continued through the violet into the ultra violet. The latter image was violet in colour, whilst that in the yellow was not so. A spectrum apparatus which he brought was fitted up, furnished with a lime light. A gelatine plate was coated with collodion chloride of silver as described, and exposed to the image of the spectrum. Being shielded from the direct light of the gas jets used for lighting the room, the plate was left for about an hour to the action of the spectrum. At the end of that time there was a scarcely perceptible trace of an image on the front of the plate at the more refrangible end. Looked at through the back, this image was more evident, but no image corresponding to the yellow could be found. This F. Greene attributed to insufficient exposure.

Seeing that the image was more visible at the back of the plate than on the front, a Member suggested that the action was due to the bromide of silver made more sensitive to direct printing by the free nitrate of silver contained in the collodion, and that the chloride was but little, if at all, affected; whilst the absence of action in the green might be accounted for by the fact that a collodio-chloride emulsion was of a colour that transmitted the yellow freely, but cut off green.

Whilst the exposure to the spectrum was going on, other matters were discussed. The CHAIRMAN enquired of T. SAMUELS whether he had succeeded in working large plates in shields of the kind which he used for small plates instead of dark-slides. It was particularly with large plates that the convenience of not having to carry a number of dark-slides would be felt.

T. SAMUELS replied that he had used shields for the size 12 by 7 with success. He found it better to use paper rather than ebonite at the back of the plates. He had found stains on the plate to result from the use of ebonite, but not from paper.

Some discussion then took place on the merits of English and American cameras.

The CHAIRMAN extolled the American studio cameras, but for landscape work preferred the English make, as lighter and more portable. He had found, too, that an English-made camera had perfectly stood the test of two seasons' work in America, besides being taken to other parts of the world.

A. COWAN said that although it was generally known that negatives were apt to be spoilt by halation when not backed up, it was not so commonly recognized that in transparencies, when made from intense negatives, the same thing occurred. He had recently had to make a transparency from a very vigorous negative having sudden contrasts, and he found that the transparency was quite spoilt by halation, which extended about half-an-inch from a clear space representing the under side of an archway. He therefore coated the back of a plate with collodion tinted with aurine, and found it to act as a perfect remedy. Orange paper squeezed on with glycerine was also effective.

T. BOLAS thought there was nothing better than a piece of



soaked carbon tissue squeezed on to the back of the plate, from which it could be easily and cleanly removed with so little trouble. The meeting then adjourned.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The ordinary weekly meeting was held on the 23rd inst., P. EVERIT in the chair.

The HON. SEC. showed one of Roche's automatic changing dark-slides that had been forwarded to him for exhibition. The slide takes the place of a reversing back, in which is held the focussing screen. After focusing, the screen is removed, and a carrier containing the plate is inserted in its place. Before placing the carrier into the slide, it is held face downwards, and a vulcanite shutter withdrawn; the plate then falls to the front. After exposure, the carrier is held face up, and the plate allowed to fall to the back of the slide.

II. M. HASTINGS showed a negative of Shakespeare's House, taken during the recent Convention. Upon developing, the film commenced to frill, the frilling extending from two to three inches from the side of the plate. It was then washed, and he had to leave it. The plate was subsequently soaked, but he was unable to get the film quite soft. As a last resource, he inserted the end of a funnel between the film and the edge of the plate, which extended the film sufficiently to force the frilled part from the plate. A soaking for twenty-four hours in methylated spirit brought the film very nearly to its original size. Prints from the negative passed round showed scarcely a trace of any defect in the negative.

The CHAIRMAN said on one occasion, in developing a plate, the film frilling clear off the plate, he recovered it, and found it had swollen to nearly double its original size; he soaked it for an hour in the methylated spirit, and now used it as a stripped film.

A. COWAN said great annoyance was often caused by halation. Simply backing the plates would prevent this. He showed two positives from the same negative, one showing halation, the other being quite free from this; in the latter case the plate had been backed in the ordinary way.

The CHAIRMAN had recently tried some plates that had been bathed in an alcoholic solution of erythrosine, but had not been washed. He was unable to get any orthochromatic effect, whatever exposures were made, with and without a yellow screen. He questioned whether the fact of the plates not being washed was the cause of his failure.

J. TRAILL TAYLOR said, in a paper read before the Convention at Birmingham by J. B. Edwards, it was stated that washing was absolutely necessary.

A question from the box was read: "Green fog seems to trouble plate-makers less now than a few years back. Is this due to better materials, or to a better understanding of the making of emulsion?"

W. COBB did not believe in a plate that would not give green fog.

J. B. B. WELLINGTON said green fog was an advantage in printing with an under-exposed plate.

J. J. BRIGINSIAW said with many amateurs a negative, instead of being regarded as a means to an end, the sole aim seems to be to produce pretty negatives; this being accomplished, further interest entirely ceased.

Question from the box: "If a portable symmetrical be used after removal of the diaphragm, to what extent will definition be impaired—say with an 8 by 5 lens?"

J. TRAILL TAYLOR said, with a properly adjusted lens, any increase of aperture must necessarily cause fuzziness; but he had removed diaphragms from lenses, which then gave just a suspicion of aberration, which he rather liked.

J. B. B. WELLINGTON, remarking upon the revival of interest in stereoscopic photography, showed an old-fashioned stereoscopic camera. It had a sliding-box body, and a compartment at the bottom to hold three double dark slides. It was well made, and the exhibitor expressed his intention of using it during the season.

It was decided that stereoscopic photography should form the subject for discussion on the 6th prox.

#### NORTH LONDON PHOTOGRAPHIC SOCIETY.

An ordinary meeting was held on Tuesday, August 21, at Myddelton Hall, Islington, N., A. MACKIE in the chair.

S. J. Stevens was elected a member of the Society.

A number of negatives and prints by various processes were passed round.

W. TAVERNER said he had not been very successful with the Pizzighelli printing-out platinum paper. He kept his paper, according to the instructions, in a calcium tube.

It was pointed out that it was stated in the instructions that the printing would be very slow if the paper was quite dry at the time of printing.

W. T. COVENTON had succeeded with this paper. He found, however, that it was very slow under any circumstances.

F. W. COX referred to experiments he had made on the effect of dampness on ordinary platinotype paper. In one of his experiments he had dipped a piece of the paper in water, blotted it, and dried it at the fire before printing, with the result that a good print was obtained, quite pure in the lights. To obtain the best results in platinum it was necessary to have a good vigorous negative.

In reply to a question, the CHAIRMAN said it was quite possible, by an after process, to change the blue colour of the image on ferro-prussiate paper. An interesting paper on the subject had been read not long since at one of the American societies, and might be found on reference to the journals. The results he had seen of experiments in this direction, however, were not entirely successful, the tints obtained not being very pleasing.

W. TAVERNER said he had made an arrangement in his dark room for rocking plates during development. As a mechanical contrivance it was quite successful, but he found that the negatives, when he used it, developed very much denser at the ends, the middle being comparatively quite thin.

In opening the discussion on "The Capabilities and Shortcomings of Single Lenses," the CHAIRMAN considered the principal, if not the only shortcoming of this class of lens, was that straight lines falling near the margins of the picture were produced as curved. This, however, was more a theoretical than a practical fault, as, unless the lens was strained—that is, made to cover a large plate in comparison to its focus—it was only under exceptional circumstances that this distortion was apparent. The amount of distortion depended, to a very great extent, on the position of the stop, and it might be taken as a general rule that the further the stop was placed from the lens, the flatter the field but the greater the distortion. A great advantage of single lenses—especially to beginners—was that they were comparatively cheap. He considered that expensive lenses were only necessities when rapidity was imperative, or when a wide angle was required to be included. For portraiture on large plates, he thought single lenses most useful, and quite as rapid in working as any other kind, as, whatever kind of lens was employed, it was necessary to use a somewhat small stop to obtain sufficient depth of definition. All the landscape work of the earlier photographers was done with single lenses. They were, however, very cumbersome instruments as a rule, and quite out of accordance with modern ideas as to portability. Such instruments were, consequently, comparatively valueless now. A lens of this class, which originally cost many pounds, could frequently be picked up for a very few shillings.

C. LONS said that Mrs. Julia Cameron used single lenses for the large heads she produced. These portraits, although they did not accord with photographers' ideas as to perfection—there being a marked absence of definition—were very artistic.

F. W. HART had supplied Mrs. Cameron with a rapid rectilinear lens of long focus, which he believed she used for her later productions.

Mr. LONS asked whether it was not a fact that the distance in a landscape was much more brilliant in negatives taken with a single lens.

In reply, it was said that many of our greatest landscape photographers used single lenses for pure landscapes on this account.

W. F. COVENTON passed round a negative view of a greenhouse which he had taken to find out whether the amount of distortion given by a single lens was appreciable.

It was agreed that it certainly was not in the example shown.

Mr. COX said a friend of his had a single lens which gave a bright spot on the plate whenever it was used with the sun in a certain position.

It was pointed out that in this instance the bright spot might be caused by reflection from some part of the mount. There occurred, however, with some single lenses, a flare spot which was really an image of the aperture in the diaphragm. The defect could be cured by slightly altering the position of the stop in either direction.

The outing for Saturday, September 1, was arranged for Broom's-bourne. Trains from Liverpool Street at 2.15 and 2.45.



## COVENTRY AND MIDLAND PHOTOGRAPHIC SOCIETY.

THIS Society held a successful out-door meeting on Wednesday, 22nd, at Merevale Park, Atherstone, by kind permission of Mr. Dugdale.

Having in view the October exhibition, there was a large muster of members, several of whom were accompanied by ladies and friends. The party travelled by brake, and, on arrival at the destination, cameras were quickly at work on the many picturesque subjects presented to their view. The weather, which at one time was very threatening, fortunately held up, and altogether, about 120 exposures were made.

After a substantial tea at the White Hart Hotel, the party returned home thoroughly pleased with the day's work.

## CARDIFF AMATEUR PHOTOGRAPHIC SOCIETY.

AN extraordinary general meeting in connection with the forthcoming exhibition of the above Society was held on Wednesday evening, the 22nd inst., at the Society's Rooms, ALEX. KELLER in the chair.

This meeting was summoned by the Council to afford the members any information that might be required.

The HON. SEC. reported that the applications already received for space augured well for the success of the undertaking. A special effort will be made to afford practical and useful evening amusement, consisting of scientific lectures illustrated photographically by lime light, conversaziones, &c., &c.

## BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of the above Society was held at the Technical Schools, Bridge Street, on Aug. 23rd, E. C. MIDDLETON in the chair.

G. H. Palethorpe and J. S. Williams were elected members, and A. J. Hutchinson and H. G. Lears were nominated for election.

A letter was read from A. L. Stern presenting a number of slides to the Society. The collection of lantern slides now reaches about 400.

Film negatives and photographs were exhibited by E. C. Middleton and J. F. F. Pickard, and an excellent group by T. Scotton, of Derby, taken during the Convention.

A whole-day excursion was announced to Church Stretton, Wenlock, and Buildwas on Sept. 3rd.

The particulars of a competition in development, as arranged by the Council, was read by the Chairman, viz.,—Each competitor to develop three differently exposed plates, provided by the Council, of different exposures on the same subject (times of exposure only known to the judges). Prize to be awarded for the best three negatives. Competitors to hand in particulars of development with negatives.

W. B. OSBORN then gave a very instructive paper on "Home-made Helps," explaining and showing numerous simple but effective home-made apparatus useful for amateurs, finishing with a description of "How to Build a Dark-room," with all the plans and details of cost cleverly drawn out.

The question of arranging to obtain a room, centrally situated, where members could meet for social discussion, and, if possible, a dark-room attached, was referred to the Council as a suggestion.

## Talk in the Studio.

**HOW TO CLEAN DAGUERREOTYPES.**—Take hold of the Daguerreotype with pincers by one corner, and, keeping the plate level, cover it with a solution of potassium cyanide, 1·25, and if the picture be much stained, heat it moderately with an alcohol lamp for fifteen or twenty seconds, when the solution is thrown off and the plate rinsed. This done, flow the plate with clear water, heat it as before, and holding it then almost vertically, dry it; in commencing to heat it at one of the upper corners and driving the water by blowing upon it to the opposite one. The whole operation should be quickly done, and the plate not too strongly heated, especially when covered with cyanide, otherwise the image might be obliterated. The Daguerreotypes may be dusted with a fine camel brush, but not touched with the fingers nor rubbed with any hard material whatever. They are very easily scratched.—P. C. Duchochois in *Anthony's Bulletin*.

**PHOTOGRAPHIC CLUB.**—The subject for discussion on Sept. 5th will be "Filling of Gelatine Negatives." Saturday outing at Chingford, from Liverpool Street, 2.32

## To Correspondents.

•• Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

**COLLETT.**—1. It is only approximately so. 2. Generally on the basis of the drachm of 60 grains, and the ounce of 480 grains; but sometimes the Avoirdupois ounce of 437½ grains is intended.

**M. C.**—We have written to the effect that reasonable caution is necessary.

**VALETTEA.**—1. Carefully wash them over with alcohol, applying the fluid by means of a tuft of cotton-wool. 2. There is no way excepting to cover with fresh paper, and then the result will not be altogether satisfactory. 3. It is not possible, as the two pictures have to be taken from different points of view. 4. Make reduced positive on ordinary gelatino-bromide plates, using the hydroxylamine developer. 5. Same way as the lantern slides. 6. Yes, it is the best form for the purpose. 7. The crude caoutchouc as imported. 8. A solution of gun benzoïn in alcohol; say 80 grains to each ounce of the solvent.

**T. CARTER.**—1. The films have probably come off through the use of so strongly acid a bath, but we cannot suggest any remedy, as you have clearly used the minimum strength which will convert the image in a reasonable time.

**W. M.**—1. We have forwarded your letter. 2. Two kinds were sent; one of light yellow glass (pat metal), and the other of plain glass; this latter being intended for coating with plain collodion. 3. To obtain a satisfactory effect, in ordinary cases the screen should have such a tint as to make the exposure four or six times the normal. 4. It will be rather an expensive article to make, as good work will be necessary for the moving parts, and we can hardly recommend you a workman.

**SUBSCRIBER.**—The simple drop-shutter, with its action accelerated by an elastic band.

**V. RADCLIFFE MOONLY.**—We will post you a few of the foreign periodicals, so as to enable you to judge for yourself. The copies we send may be imperfect, and we do not want them back.

**PLATINOTYPE.**—1. Write to Dr. B. W. Richardson, of 25, Manchester Square, London. 2. They are not very suitable for the purpose, as the heat will tend to make them scale off. The glass should be coated with bichromated albumen (white of one egg, water 1 ounce, bichromate ammonium 20 grains), drained on edge, and dried in a light place before the tissue is mounted upon it. We recommend you not to varnish, but to mount with a thin glass on the film side.

**TOURIST.**—There was a very thin kind of patent plate glass in the market some years ago, but we do not know whether it can still be obtained. Enquire of G. F. Williams, 36, St. Martin's Lane, London.

**A. W. L.**—See the YEAR-BOOK OF PHOTOGRAPHY for the current year, page 171.

## Photographs Registered.

ROBERT SYMONS (Tenby)—Photo. of Two Spaniel Dogs.  
W. J. ANCKORN (Arbroath, N.B.)—Photo. of Professor Blackie.  
L. V. FRIDGE (Stratford-on-Avon)—Photo. of Covey of Partridges in the Snow; Photo. entitled "The Missing Link"; Photo. "A Struggle for Life."  
SYDNEY V. WHITE (Reading)—Photo. of "Reading Albion Football Club."  
J. BYRON (Nottingham)—2 Photographic Groups of Nottingham Philharmonic Choir.  
J. RUSSELL and SONS (Wimbledon)—Photo. of The Australian Cricketers.  
S. PORTER (Chippendale)—Photo. of Lord and Lady Lansdowne's Public Reception at Calne.  
F. W. BROADHEAD (Leicester)—Photo. of the Duke of Rutland; Photo. of the Duchess of Rutland.  
G. QUATREMAINE (Stratford-on-Avon)—Photo. entitled "A Suspended Member"; Photo. of Falcon and Heron Fighting.  
H. L. MOREL (Nottingham)—Photo. of Jack Lee (Cyclist).  
R. K. R. FLAMANK (Aston)—Photo. of Illicit Still, Birmingham.  
A. G. TAGLIAPIERRO (12, Hart Street, Bloomsbury)—Photo. of Girl Praying.

## The Photographic News.

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For Advertisement Scale see page v.



# THE PHOTOGRAPHIC NEWS.

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### LONG OR SHORT WASHING FOR PRINTS.

THE want of permanency, or rather the uncertainty as to the permanency, of photographic prints upon albumenized paper, is a subject that we have ever with us. We suppose that there are very few professional photographers having been in business for some years, who have not felt a sickening sensation on finding some of their work present the damning evidence of fading of some sort going on in them. It seems strange that after so many years the conditions of permanence—comparative permanence, that is—should not be more clearly ascertained and capable of being authoritatively set forth than they actually are. If all photographs on albumen paper faded, we might look upon it as an inevitable necessity, before which we must bow, and resign ourselves as well as we might to a fate that could not be avoided. The fact, however, that so many prints of many years' standing are almost, if not quite, as good as when first prepared, whilst others of about the same, and some of very much later date of production, have faded into the sere and yellow leaf, proves that fading is not so much a necessity, as a circumstance the occurrence of which might be postponed, perhaps, indefinitely, if we could ascertain for certain the different conditions; perhaps, in some apparently trifling matter, which have obtained in the prints showing such different powers of withstanding the ravages of time.

One condition—the one which was early considered as that of greatest importance towards the prevention of fading—is the complete elimination of what hyposulphite of soda is left in the paper after the fixation of the print. Time has, however, shown that prints which have received great care to promote this end—the complete removal of the hypo—have in some cases faded very rapidly, and very badly. On the other hand, prints which it is known have had only a very rapid washing, have in some instances remained beautifully fresh and bright. Further, prints have been shown after the lapse of some considerable time in good preservation in spite of their having had, as has been asserted, a definite quantity of the fixer salt left in them. This, however, is a proceeding which, if valuable as an experiment, made in order to show that we must look elsewhere than in the presence of trace of hyposulphite of soda for the causes of fading, is not one which any one would recommend for general adoption by photographers anxious to preserve, or acquire, a reputation for permanence in their work. Being driven, therefore, to look for some other cause for fading than the one which was long esteemed to be the great if not the sole one, various conditions have been examined, with the result that in one case, that of long washing, the evidence seems decidedly in favour of the view that the very means taken in order to bestow permanency upon photographs, is one actually tending to induce quicker and more certain fading.

We were first led to suspect the injurious influence of long soaking upon albumenized prints many years since, from that observation of a photographer, that the prints taken from the washing apparatus on Monday morning were generally somewhat poorer than those of the rest of the week. The prints toned on Saturday had been soaking after fixing for some forty hours or so, and it seemed as if during that time there had been some slight decomposition of the organic matter used as sizing in the paper upon which the prints had been made. This view was confirmed by experiments that were published some time later, in which it was shown that a final bath of strong alum solution enabled prints to withstand the effects of an atmosphere saturated with moisture for a longer period than those which had not received such treatment; the antiseptic property of alum on such organic substances as are used for sizing paper being well known. That the contact of partially decomposed organic substances with a photograph tends to rapid fading is shown by the well known fact that starch paste, if used after it has become sour, will cause prints to fade very quickly. If used for mounting when in this condition, the marks of the brush on the back of the prints are reproduced as streaks of fading on the photograph in a very striking way.

Since, then, long soaking tends to induce decomposition of the organic sizing in paper, and since such decomposed organic matter causes photographs to fade, it is evident why those prints which have received unusually long washing should show a weakness that suggests incipient fading, such as may be expected shortly to develop into the sickly yellowish colour characteristic of photographs when their time has come. The inference is obvious: do not wash prints longer than is necessary to ensure elimination of the hypo.

The next question is, what amount of washing is necessary in order to get rid of the hypo? The answer to this must depend upon many attendant circumstances, such as the thickness of the paper, the temperature of the washing water, the number of prints washed in one batch, &c. We may, however, mention the fact that in looking over an album recently, the lady to whom it belonged remarked that So-and-So's photographs—indicating some in the book—always fade. Another set of photographs in the same album were remarked upon as generally standing well, some of them being from five or six, up to fifteen or twenty years old. We happen to know that it is the practice of the photographer by whom the prints just mentioned were issued, to give no more than from one to two hours' washing, when the prints are removed to the mounting room. The washing is done in small batches, and after the prints have been removed from one dish to another, one at a time, and with fresh water at each change of dish for about half an hour, they are laid in a pile on a glass



slab and pressed with a sponge. This is particularly necessary if there are any blisters, which would otherwise retain a dilute hypo solution, and cause greenish spots of fading. They are then placed in a dish of warm water, in which they are moved one at a time to the top, and then the lot turned over, and the moving to the top repeated in a manner similar to that used when toning. After two or three turns in the warm water, and about ten minutes' immersion therein, they undergo a couple more changes in cold water, in which they are either left for an hour or so, or taken out sooner. The immersion in warm water appears to dissolve out some of the sizing of the paper, and what hypo is left comes away with it. At all events, the prints seem to be thoroughly washed, and we think their chance of permanency greater than that of those which are left for long washing in cold water in the ordinary way. The power of warm water in extracting soluble matter is very remarkable, and the plan altogether is one we would recommend; but it must be observed that it is essential that the quantity of prints to be treated at one time must not be large, otherwise there will be danger of insufficient washing. Where not more than from two to four sheets of paper are used, a sufficient number of turns can be given to ensure elimination of the hypo. Larger quantities should be divided into batches, each batch to be fixed and washed separately. The washing dishes, too, should be large and deep. Brown ware baking dishes of the larger sizes are convenient and suitable for the purpose.

#### DESIRABLE FEATURES IN CAMERAS.

IN a recent communication to the Philadelphia Amateur Photographic Society, Charles Truscott sums up the main points which make a camera desirable for field work, and although we cannot realise incompatible conditions, it is a good thing to recapitulate the features which are desirable. Among other things, Mr. Truscott says:—

Camera boxes are of two kinds (why, I do not know)—the portrait box and the view box. The only difference of any consequence in these two classes of cameras is that the portrait camera is made clumsy and heavy, whilst view cameras are usually light and flimsy.

While we can find no fault with many modern cameras on the score of portability, we look in vain for a still more important feature—viz., a wide range of usefulness.

The camera we are supposed to be seeking is one in which no element of utility is sacrificed to excessive portability and compactness. It must be equal to any and all demands that may be made upon it within the limits of size, and the capacity of photography. It must be equal to all kinds of architectural view, portrait, copying, and enlarging photography; in short, a serviceable camera of all work. Many may not desire such a camera for their own use, but the consideration of it may be helpful to enable you to decide how many features (if any) you are willing to sacrifice in order to obtain greater lightness and compactness.

The amount of ingenuity which has been expended in camera designing has been very great, and the number of different patterns made in this country would seem to indicate that our task need be only one of selection; but I venture to think that a large part of the ingenuity developed on camera design and construction has been misapplied, or applied in only one direction—viz., that of compactness and lightness; hence the market is full of fairies, phantoms, feather-weights, and flimsy toys, more ornamental than useful; many qualities of utility, such as rapidity and strength, being sacrificed to this (to me) insane demand for less weight and bulk. I have no wish to underrate these qualities; indeed, we must have them as far as is compatible with other, and, in my view, still more important qualities.

Before ordering our camera, the first thing to decide is the important matter of size of plate we intend it to work. We must remember that every square inch in size of plate adds greatly to both bulk and weight. Five inches by eight is a very common size, but as it is ill adapted for pictorial purposes, we will prefer a 5 by 7 or 6½ by 8½, and having some muscle and not being afraid of exertion, we decide on the larger size.

A 6½ by 8½ camera, to cover a wide range of work, should have a draw of from 3 inches to about 24 inches, allowing us to use lenses of long focus, and also be useful for copying.

We will next decide whether it is to be a front or back focus. Let us first inquire what are the advantages of each. The principal advantage of the front-focus camera is that it permits the slide being drawn down instead of up. When using the plate with its length vertical, this diminishes the danger of light passing down the slide slit, as it is liable to do when drawn up. Besides, it is more easily reached, especially with larger cameras. Besides this we have sometimes to work in corners or near the ceiling, where we have no room to draw the slide up. Most of the front-focus cameras on the market are, however, carefully made to prevent our reaping this advantage. The disadvantage of the front-focus camera is, that the oed projects itself into the picture when using lenses embracing wide angles, especially when we drop the front below the centre. Another disadvantage is that in the case of a camera having a long draw the focusing pinion is apt to be in an inconvenient position when the camera is fully distended. This difficulty can, however, be overcome.

The back focus camera allows the front to fall free of the bed, but does not allow the slide being drawn downward. Of the two, therefore, the back focus has the decided preference, as the bed never intrudes itself into the view. But seeing that each has its advantages, our camera must have both, or what comes to the same thing, be interchangeable.

The bellows next claims our attention. They are made both taper and parallel; the former, of course, packs into the smallest space, but the latter is by all odds the best for work, if that is to be the great desideratum. The conical bellows has an ugly trick of cutting off part of the image. It also restricts the amount of rise and fall of the front, especially when we need it most, viz., when using lenses of short focus. This being a very bad fault, we readily decide in favour of the parallel bellows.

Nearly all the better class of cameras are provided with a single swing-back, that is, it swings only on one inner axis. The swing-back is a very useful adjustment when used with discretion, although some able men cry out against its use altogether, and say it is never necessary if we have plenty of movement to the camera front, and that nothing but distortion comes from the use of the swing-back. But as we are of a different opinion, we shall insist on our camera having a double swing that is both vertical and horizontal.

Double plate-holders are made of book form, and also solid. The book form are necessarily more expensive, and the frame being in two parts must be weaker, and in the larger sizes liable to warp and leak light. The most desirable form of the solid holder is one in which the plate is introduced at the end by sliding into a groove on either side of a fixed division.

Of course this camera must be provided with a reversing back and a rising and falling front, with a range of seven inches, that is, capable of rising three and a half inches, and of falling a like amount.

Now a word about carrying cases. They are generally made too broad. A case should never (unless absolutely necessary) be more than seven inches wide to carry with comfort, otherwise it will strike against the knees at every step, unless you walk out of perpendicular. The length and depth may be as much as you like.

Again, it is a mistake to pack everything into one case. Let the camera, lenses, and focussing cloth be packed in one case. The plate-holders can be packed in a satchel to be carried at the back, or with the tripod in the other hand; the weight is thus more evenly distributed, and more easily carried.

#### THE POSITIVE CYANOTYPE PROCESS, OR METHOD OF REPRODUCING WITH DARK LINES ON A CLEAR GROUND, FACSIMILE COPIES OF DRAWINGS, PLANS, AND TRACINGS.

BY COL. WATERHOUSE.\*

THE following method of reproducing plans, tracings, &c., drawn in black ink on white paper or tracing cloth, is known as the "Positive Cyanotype Process," and has the great advantage of giving copies of the drawing reproduced directly in dark blue lines on a white ground, while,

\* Compiled in the Photographic Office, Survey of India Department, Calcutta.



unless a photographic negative be used, the negative cyanotype process gives prints with white lines on a dark ground, which are not so easily legible as the positive prints, though the process is simpler. Both methods were the invention of Sir John Herschel, but have been improved and perfected by Poitevin, Marion, Pellet, and others in France, and the positive process is now more commonly known by the names of *Cyanofer* and *Gummoferrique*, which have been given to it in that country.

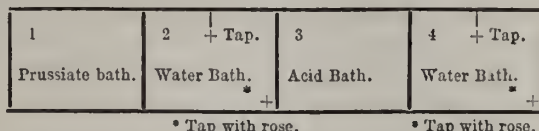
**Apparatus.**—The apparatus required is simple, and consists of a pressure-frame with plate glass, similar to those used for ordinary photographic work, and large enough to take the largest tracing or drawing required. The back-board should be jointed in three, and have three cross-bars. In large frames four or five cross-bars may be necessary. A piece of felt or thick flannel should be cut to the size of the frame and kept with it; in place of the felt a few sheets of clean, soft paper may be used. The glass of the frame should be kept clean on both sides and free from scratches, and the felt or paper pads should be kept thoroughly dry, and be well aired in the sun before use. With printing-frames of large size, it may be convenient to mount them on a pivoting stand, so that they can readily be placed at any angle perpendicular to the sun's rays, or turned face downwards while being run in and out of the dark room, or during the examination of the test slips. Sometimes, instead of a wooden pressure-frame, a thick plate of glass only is used, supported on an India-rubber air cushion, the pressure of which against the glass gives very perfect contact. It has also been proposed to obtain close contact in a simple way, without the use of glass plates or frames, by stretching the sensitive paper and tracing over a cylinder; the cylinder has, however, to be kept turned during the progress of the exposure. For work up to the size of a double elephant sheet, the pressure-frame will probably be the most convenient arrangement.

**Dishes and Trays.**—At least three trays will be required for chemical solutions and washing; but it is strongly recommended to have four, so that each tray may be kept for a special purpose. Two of the dishes, intended for chemicals, may be made of *papier maché*, or of wood lined with gutta-percha or India-rubber. As India-rubber and gutta-percha do not stand the Indian climate well, it will be better to use trays made of wood well varnished with shellac varnish, or a composition of :—

Asphaltum	...	...	...	7 pounds
Beeswax	...	...	...	2 "
Linseed oil	...	...	...	1 pint.

Before the varnish is dry, the tray is well lined with strong linen cloth, and then coated again two or three times with the varnish. According to Fisch (*La Photocopie*) trays lined with lead may be used for the prussiate and acid baths. Where the arrangements are fixed, these will perhaps be the most convenient, especially for work of large size. The lead might be varnished with advantage, and the coating renewed as necessary. The other two trays, used for washing the prints, may be made of strong sheet zinc, or of wood lined with zinc. For these two trays, water-supply, with pressure of at least five or six feet, will be necessary, and should be led into them by India-rubber tubes about one inch in diameter, and not quite long enough to reach to the bottom of the trays. The taps may be fixed about 18 inches above the troughs, and the India-rubber tube be from 10 to 15 inches long. A rose may be attached to the end of the rubber tube, but it is better to have an additional rose jet as noted below. All the trays should be about three or four inches deep, so as to allow room for about one inch depth of fluid without fear of splashing over. The zinc trays should be occasionally scoured with fine sand and a little solution of potash or soda. It will be convenient to have the four trays arranged

in order, as shown in the diagram, at a height of 2½ to 3 ft. from the ground—



It will also be found a convenience in washing to place an additional tap at the right hand corner of the washing trays, fitted with a foot or two of half-inch rubber tube, carrying at the other end a copper rose with a bent neck about six or eight inches long, which may be held in the hand, so as to direct the water jet all over the sheet, and thus remove the gummy coating without brushing. It is recommended that a sheet of plate glass should be placed in the zinc tray so as to obtain a perfectly level surface, which will facilitate the brushing, and require less water. It is more easily kept clean than the zinc. For preparing the sensitized paper, a flat board—or, better, a sheet of glass—provided with clips, for holding the paper while being coated with the sensitized solution, will be necessary; also some broad, soft camel or badger-hair brushes for coating the paper and clearing the prints. Thomson's patent damping brushes, which consist of a piece of fine felt fastened round a flexible wedge-shaped piece of India-rubber attached to a handle, are very suitable for applying the sensitive solution. If these cannot be obtained, a brush may easily be made by fastening some velvet or felt on to the wooden handle of an ordinary four-inch damping brush. Some glass measures, funnels, and suitable vessels for mixing and holding the various solutions will be necessary; also some stoneware jars or wooden tubs in which to prepare the acid and prussiate solutions in quantity, and some stoneware funnels for filtering these solutions when necessary. A Baumé's hydrometer for heavy fluids will be useful for ascertaining the strength of the perchloride of iron and prussiate solutions. It should also be graduated with a scale of corresponding specific gravities.

**Chemicals.**—If the sensitive paper is purchased ready prepared, the only chemicals necessary will be ferrocyanide of potassium or yellow prussiate of potash, which should be of good quality, and some sulphuric or hydrochloric acid. Some oxalate of potash will be necessary for removing blue stains from the prints, and caustic potash will be found useful for removing stains from the fingers, and for cleaning the zinc trays. For preparing the sensitive paper, the following additional chemicals will be necessary :—Gum arabic, which should be of good quality, white and readily soluble; tartaric acid, or ammonio citrate of iron, according to the formula employed, and perchloride of iron. The latter salt is commonly sold in amorphous semi-crystalline lumps, but very readily deliquesces into a syrupy fluid, and therefore it may be more convenient to mix its solution to a certain strength by aid of the hydrometer.

A solution of perchloride of iron at 45° Baumé contains about 47 per cent. of the anhydrous salt, and its specific gravity at a temperature of 60° F. will be about 1.453.

**Ready Sensitized Paper.**—Paper specially prepared for this process by various continental firms is now an article of commerce easily obtainable in London or Paris. Some of Pellet's paper obtained some years ago from Mr. G. E. Chapman of 113, Victoria Street, Westminster, who also supplies all necessary apparatus and materials for the process, has lately been used in the Photographic Office, Calcutta, and found to be in good order. In many cases it might be more convenient to purchase the paper ready for use than to prepare it. Without proper appliances it is difficult to get an even coating.

**Preparation of the Sensitized Paper.**—Two methods have been tried in the Survey of India Photographic Office, Calcutta, both of which have been found to answer well,



*Paper.*—It is important that the paper used for the prints by this process should be hard and well sized, so that the sensitising solution may be kept as far as possible on its surface, and stains avoided. Good ordinary drawing paper is suitable, also the Rives or Saxe paper generally used for photographic prints. The thick photographic paper No. 50, especially prepared for this purpose by Messrs. Schleicher and Schull, and obtainable from Messrs. Treacher and Co., Bombay, has been found to give the best results. Bank post paper, either thick or thin, is not so suitable.

*The Sensitising Solution. First Method—(a).*—The following two solutions are made up separately:—

1.—Gum arabic (best) ...	...	...	170 parts
Distilled water ...	...	...	650 „
2.—Tartaric acid ...	...	...	40 parts
Distilled water ...	...	...	150 „

When the gum arabic is perfectly dissolved, which is facilitated by first powdering it, filter the solution (or strain through muslin) into a clean vessel. Then add, constantly stirring, the tartaric acid solution. When they are thoroughly mixed, 100 to 120 parts of a solution of perchloride of iron at 45° Baumé (sp. g. 1.453) are added in the same way, very slowly and with constant stirring, after which the mixture should be set aside in a dark place for twenty-four hours. Distilled water is then added until the mixture shows a density of not more than 1100 on the hydrometer. It is essential that the mixture of the different solutions be made in the order given above. If the perchloride of iron were poured direct into the gum solution, the latter would be immediately coagulated or thrown down in a sticky insoluble mass, which can only be brought back to a liquid state by adding an excess of tartaric acid solution; but when this latter is already present in the gum solution, there is no fear of coagulation. The solution is of an orange yellow. If kept carefully protected from light, it will keep good for a long time.

*Second Method—(b).*—Another sensitising solution, recommended by Captain Pizzighelli, of the Austrian Army, which has been found to give brighter prints than (a), is made in the following way:—Three solutions are made up of—

1.—Gum arabic... ..	...	...	20 parts
Water ... ..	...	...	100 „
2.—Ammonio-citrate of iron ...	...	...	50 parts
Water ... ..	...	...	100 „
3.—Perchloride of iron ... ..	...	...	50 parts
Water ... ..	...	...	100 „

No. 1 can only be kept a few days; Nos. 2 and 3 keep for several weeks in well-stoppered bottles. When required for use they are mixed together in the proportions of 20 parts of No. 1, 8 parts of No. 2, and 5 parts of No. 3, and in the order given, or the gum will be coagulated. Should this occur after all, the mixture may again be rendered liquid by adding a few drops of glacial acetic acid. In any case, the mixture of Nos. 1 and 2 thickens on the addition of No. 3, and in a short time loses its glutinous properties, and after standing a few hours becomes a thick magma: it is then, according to Pizzighelli, at its best. It has been found, however, difficult to coat the paper with the mixture in this condition, and it is better to add a little acetic acid before adding No. 3, in order to prevent the mixture from thickening. The solution will not keep more than a few days. Whichever of these two sensitising solutions is employed, the subsequent processes are the same.

*Sensitizing the Paper.*—This operation and all the subsequent ones, except the exposure to sunlight, must be performed in a room illuminated by yellow light passing through one or two thicknesses of yellow paper or calico fastened over the windows, or by candle or weak lamp light. The paper is laid smoothly down on a drawing

board or glass plate, and must be firmly fastened down on two sides with pins, rods, or clips. It is of importance to note that the sticky nature of the sensitizing solution is liable to cause a dragging of the paper from its fastenings, which, if not firm, may cause the paper to crease or tear. The sensitising solution is now poured into a flat dish or plate, and applied to the paper with a soft broad brush, as described above, or with a piece of soft sponge, in an even coat, passing it lightly over the paper, up and down and across, taking care to equalise the coating as much as possible, and to avoid streaks. The coating should not be too thick nor yet too thin. Each piece of paper coated should be hung up at once to dry in a dark place, preferably in a drying-box heated by a stove. It is important that the paper should dry quickly, so that the solution may not sink into its substance. The paper is said to keep indefinitely, provided it be protected from damp and light. As soon as the papers are dry, it will be well to put them away carefully in an air-tight tin case. It has been found in the Photographic Office that the paper prepared by the first method will keep in good order, but that prepared by the second method will not keep more than a day or two, and therefore must be freshly prepared as required.

*Printing, or Exposure to Light.*—The glass of the pressure frame being thoroughly clean and bright on both sides, close the yellow windows of the dark room, and lay the tracing face downwards in the frame, and over it a sheet of the sensitised paper with the prepared or yellow side in contact with the back of the tracing. Over the paper lay a sheet of felt or some sheets of clean paper, which should have been previously dried in the sun, and with both hands carefully smooth outwards from the centre. Then put in the back board of the frame and fasten down the centre bar, having laid the test-slips in position, after which fasten down the end bars. Unless the plate-glass, the tracing, and the sensitised paper are in close and uniform contact all over, it will be impossible to obtain sharpness in the finished prints.

If a tracing on paper is creased and wavy, it is recommended to fix it on the glass-plate by gumming the edges to the glass at intervals. The back of the paper is damped with a sponge, and instantly swells out in waves, but afterwards stretches perfectly smooth on drying. In this way the smoothing is done once for all, and perfect sharpness all over the proof is secured. The frame should be exposed towards the south, so that the sunlight may fall perpendicularly upon it, or so that it may get a good direct light. Care should be taken that no shadows or bright reflections fall upon it. The sensitised paper must be kept smooth and free from creases, which would prevent perfect contact with the tracing. In damp weather special precautions must be taken to prevent the sensitive paper being affected by moisture during the operations. The exposure varies according to the intensity of the light. In direct sunlight an exposure of fifteen to forty seconds is sufficient to produce the reduction of the iron salts to the state of ferrous chloride, except in the parts protected by the lines, where it remains in the state of ferric chloride. In the shade or dull light the exposure may be prolonged from one to five minutes; in rain five to fifteen minutes, and in dull, foggy weather may require fifteen to thirty minutes or longer. One soon learns to guess the proper exposure under ordinary conditions of working. It is important, however, that the exposure should be exactly right, and therefore, unless the exact time required is known from past experience, it is advisable to make use of the following simple test:—A few lines of varying thickness are traced on the edges of the drawing to be copied, in the same ink as was used to make the drawing. Over these lines and between the drawing and the sensitised paper are placed some slips of the same sensitive paper, about one inch wide, the ends of which protrude beyond the edges of the printing frame in such a way that each slip can be drawn out of the



frame at will. It is then possible, by testing the effects of light on each of these slips with the developing solution successively at different intervals, to watch the progress of exposure, which is not possible in any other way, because the paper changes colour but slightly under the influence of light, and by opening the frame there would be risk of doubling the lines. When it is not convenient to draw the test lines on the tracing itself, they may be drawn on a small separate piece of tracing paper of the same quality as the original tracing, which is placed in a small pressure frame and exposed alongside the tracing being copied, and under exactly the same conditions of lighting. To apply the test, expose the frame to full sunlight for a few seconds, then turn it over to protect the sensitive paper from light, and withdraw one of the test-slips. Then immediately plunge the end of the slip which was inside the frame and under the black lines drawn on the edge of the drawing into the solution of ferrocyanide of potassium used for developing, and watch its chemical action for forty to fifty seconds. If the lines appear at once in blue, but the ground of the paper is also tinted blue, the exposure is insufficient and must be continued. These tests are continued, after intervals of a few seconds, with fresh slips of test paper, until a point is reached when the paper remains yellow and quite free from blue spots, but the lines appear sharply reproduced in blue, which indicates that the exposure is exactly sufficient. If, however, the ground of the paper remains yellow, but the lines are broken and faint, the print has been over-exposed and should be rejected. The print, having been correctly exposed, is taken to the dark room, and there removed from the frame. If the copies are rolled up, put in a dry place, and excluded from the light, they may be kept for some hours, or even days, before being developed, and thus the printing can be completed under uniform conditions in the best part of the day.

*Development of the Prints.*—This operation must be performed in yellow light. The developing solution consists of a solution of ferrocyanide of potassium at 20 per cent., or about saturation. Should crystals form in the solution, water should be added to just dissolve them. The specific gravity of the solution should be about 1.1275, or about 16°B, and it should not be used to saturation in hot weather, when more of the salt will be dissolved. The solution is conveniently prepared by putting a quantity of the yellow crystals into an enamelled pot with two or three times the quantity of boiling water, and stirring the solution from time to time with a wooden rod. The solution is poured off into the tray as required, and more crystals and water added as necessary to keep up the stock. The bath can be used till it is exhausted, and is in no way dangerous. A sufficient quantity of this solution at the strength indicated above should be poured into the first tray so as to fill it to the depth of about an inch. The print should not be allowed to touch the bottom of the tray, otherwise stains will be caused. Before commencing to develop, the prints are laid, face downwards, on a table, and the edges turned up carefully with the aid of a straightedge, so as to form a sort of tray  $\frac{3}{4}$  in. in depth. This renders the sheet more easy of manipulation, and leaves the back white, and in the end saves time. The copy must then be floated, face downwards, on the prussiate bath (No. 1), care being taken not to get any of the prussiate solution on the back; any air-bubbles must be removed by each of the corners of the copy being quickly lifted in turn by one hand, and gently lowered again, the other hand being used at the same time to drive out the air-bubbles from the centre. After floating the copy on the prussiate bath for half a minute, the copy must be lifted by raising one end with care. This can be done without getting any of the prussiate on the back, which otherwise would leave blue stains. The copy must now be held up, and the action of the prussiate allowed to continue, but only so long as the yellow ground remains free of blue spots. The longer the copy can be kept with the film of prussiate on,

the stronger and darker will the lines come out. As soon as blue spots begin to appear on the yellow background, the copy must at once be immersed face downwards in the zinc tray (No. 2), already filled with clean water. This checks the further action of the prussiate solution. One edge of the paper must now be depressed beneath the surface of the water, and the whole paper then lifted by that edge; the water will thus be made to flow all over the back of the paper. This washing must be repeated two or three times, then the copy must be wholly immersed in the hydrochloric acid bath (No. 3) for five to fifteen minutes, and its surface dabbed all over with a brush in order to start and loosen the blue mucilage. The copy is next taken out of the acid bath, and must be laid face upwards in the empty zinc tray (No. 4), where it must be well rubbed all over with a brush to get rid of the superficial blue mucilage, and then copiously flushed with plenty of clean water. The lines of the copy will then be found to stand out blue on a clear white ground. The copy must be hung over a half-round piece of wood to dry. If only one zinc water tray is used for washing in after the chemical baths, care must be taken to rinse it out well after each washing, as the slightest admixture of the acid and prussiate solutions would stain the copy blue. It saves time if several copies be developed up to the acid bath stage, and left, care being taken to turn each copy face downwards before another is put on the top of it; also, always place the copy in the acid bath with the face upwards, then brush over with the acid solution, and turn face downwards.

*Acid Bath.*—Either sulphuric or hydrochloric acid may be used for clearing the prints. The former requires more precaution in using than the latter. It must be mixed in strong stoneware vessels by adding three parts of the acid to 100 parts of water, and not *vice versa*. The strength of the hydrochloric acid bath is from 8 to 10 parts of acid to 100 of water. A mixture of two quarts of the acid with five gallons of water will fix about 100 copies double elephant size, after which the solution becomes full of blue precipitate, and should be renewed. The objection to the use of this acid is on account of its fuming, but this is slight.

*Causes of Failure.*—1. The ground appears blue. This arises from under-exposure to the light, or from the print having been kept too long exposed to the action of the prussiate bath. 2. The lines are broken and pale, while the ground remains white. This may be due to over-exposure, or to the lines of the tracing not being sufficiently opaque to stop the passage of light through them. 3. When the print is put in the acid bath, the lines turn a dark blue, which washes off when being brushed. This arises from insufficient development in the prussiate bath; if the ground is also blue spotted, it is from under-exposure.

*Removal of Stains.*—If, in spite of all precautions, stains or spots of blue appear on the ground of the print, they may be easily removed, or alterations made in the drawing, by means of a solution of oxalate of potash made by dissolving one part of the neutral salt in four parts of water. A solution called "blue solving" is sold ready prepared for this purpose. The liquid is applied lightly with a camel's hair brush to the stains or lines to be erased, and dried off with blotting-paper. When dry the parts will appear white. This solution should only be applied to the prints when dry. Blue stains on the fingers may be easily removed by means of a very weak solution of caustic potash or soda, and may be avoided by the use of India-rubber gloves or finger stalls. Prints produced by this process are quite permanent and unchangeable by light or damp.

*Preparation of Drawings or Tracings.*—Any drawing or print in black ink on white paper not too thick can be copied by this process; but to secure the best results it is preferable to use tracings with a clear translucent ground and black opaque lines carefully prepared for the purpose.



The tracing paper should be quite white or slightly blue, fresh and transparent, of even texture, and free from stains or spots. Old paper, which is generally yellow and brittle, should not be used. The tracing, or parchment, papers specially prepared by Messrs. Schleicher and Schull, for photographic work, are to be recommended, and are obtainable from Messrs. Treacher and Co., Bombay. The drawing must be made with perfectly black ink, in firm full lines, especially the finer ones, so that they may be quite opaque. Some Indian yellow or burnt sienna may be added to the Indian ink to give it additional opacity. Care must be taken to keep the back of the tracing clean and free from anything which might print through and interfere with the clearness of the design. As far as possible, all lines usually drawn in colour should be drawn in black dotted lines of different kinds. However, if the use of colour in the original is compulsory, red lines should be drawn in thick vermilion or burnt sienna; yellow lines with Indian yellow or chrome yellow; brown with burnt umber, sepia, &c.; blue and green lines with a mixture of chrome yellow and dark prussian blue in different proportions. Pale blue lines, for water levels, &c., will not reproduce, and should be drawn in black. All washes of colour should be avoided on the tracings. They can be put on after making the reproductions, and may in many cases be replaced by ruling or cross-hatching. Tracing paper is recommended in preference to tracing cloth as more even in texture, and allowing of finer lines being drawn on it.

#### "OUT WITH A CAMERA": SUGGESTIONS AS TO CHOOSING SUBJECTS.

BY J. GALE.\*

HERE we are—cameras in hand—a magnificent morning, thirty miles from London—"far" enough "from the madding crowd"—what shall we do?

Well, we have the choice before us of this lovely valley with its purling brook, close-wooded scenery, and scattered cottages; or we have the adjacent hills, with wide expanse of open fields and a grand horizon.

Is it to be simple landscape, or shall we see what we can find in the way of figure studies, or both? We have our single-view lens, and that other which we fancy is best for groups.

As yet not a zephyr disturbs the leaves, and only a few light, fleecy clouds, low down, are visible. We will give our attention to what is before us, for the clouds will gather by the middle of the day, and the wind will freshen, as it has done each day lately; we can then turn to the hills—where there are broad expanses of open country, with teams at plough, and women weeding or hoeing—and the wind will interfere with us less—if it be not sometimes an advantage to have a little of it in our figure groups with landscape.

Yes, this valley with its gabled cottages and gardens full of colour is very charming, and seems to present to us a picture at every turn of the road.

But how deceptive is colour to the photographer; how often we are allured by a landscape or a group, and how difficult it is to realise that the charm consists in its colour, which a painter can render, but we cannot; divested of that it is, as a picture, flat, stale, and unprofitable. It wants a discerning eye to judge of what help colour will be to us; the greys, and the greens, and browns and reds of the lichens on the brick or stone walls, the rich coloured mosses on the thatch, the yellow wash of the cottage front, are all renderable and effective in photography as giving gradations or contrasts of light and shade where wanted. But those red-brick cottages and gardens ablaze with colour, that sparkle in their background of bright green trees, will be nowhere, or scarcely visible, in the photograph. Let us go on, and keep our eyes open—not to what we see before us only, or what may actually present itself to us as a picture worth securing, for we may often go a long way and not satisfy ourselves in that respect, but to more simple and homely bits, and turns, and corners; that, with the introduction of a figure, may give us a picture full of interest.

Here is a cottage—one of many in the village—very pretty,

\* A communication to the Camera Club.

very nice, with the doorway partly overgrown with vine, and some worn red brick steps leading up to it, and a latticed window abutting on it. One would not think of taking that as it is; but what a capital setting for a group! Let us knock at the door and ask the occupier if we may take a "sketch" of her pretty doorway (if we were to call it "a photograph" she might mistake us for itinerant professionals, and expect to be asked some day for payment—such things have happened). It may be she is a comfortable and obliging sort of woman, and would not our asking her to stand in the doorway with a broom in her hand, and one or two of those fair-haired children seated on the step, perhaps with their dolls or their school slate. Yes! she is pleased with the thought of it; she won't mind if you ask her to let you borrow a pail, or a jar, or a stool, and the bigger girl may come, the other is going to school.

Now, then, treat the subject as you think best. The woman may be seated, and the girl standing, slate in hand, doing her sums, or standing broom in hand or knitting needles, while the girl prepares to move off with a basket on her arm. There are half-a-dozen ways of treating this doorway and these two figures, open to your fancy; but let it be a simple, natural treatment of the subject, the accessories subservient to the group, and only such as you would be likely to find at the cottage doorway in the ordinary way. Do what you can to make the people feel easy and at home with you; occupy them so that they may think of what you have set them to do, and not of the camera; and be careful not to try your sitters' patience too much. You know the capabilities of your lens, and should know how much will be comprised in your view. Get the focus and the margins of your picture, and then set your models within it where you have made up your mind they will look best and most natural. It ought to be scarcely necessary to focus again, but a last brief look on the ground-glass may be taken, and the plate inserted into the camera. Your figures in position, you may do all the little finishing touches to the hat, the hands, or the attitude—see that the accessories are right; and perhaps you may first practise them in keeping still for two or three seconds, telling them you are not going to take them this time. If they behave as you wish, they will have recovered their breath for the real exposure, for it is sometimes an awful ordeal to them (unless you have done your part nicely and kindly); it will not be so bad the next time. But give them due notice of the real exposure, and due notice when it is done, for they are grouped, not looking towards the camera, and will think it necessary to keep still until you liberate them. Our sitters have behaved properly, the lighting was good, and everything favourable. One of those silver coins we have taken care to provide ourselves with will be an acceptable present to the little girl; or, just think; with such a negative as this will turn out, it will be well worth a shilling paid to the mother to buy a book, or another doll for the children. But do not promise a copy of the photograph unless you mean conscientiously to fulfil. The promise is treasured up, and the photograph looked forward to anxiously, and great will be the disappointment at its non-arrival, and disrepute of the amateur. Now let us help, or offer to help put back the things in their places, and move on, as an old timber waggon and rustic team of horses that passed by while we were busy has pulled up at the roadside inn, a little way up the village, and we must see if we can make use of it. The group was well worth the second plate exposed upon it; it will give us the opportunity of experimenting, within limits, in the development, or correcting it; for how seldom do we complete a negative without the thought that it might have been improved by a little difference in its treatment under the developer; but having made up our minds which is the better and more satisfactory one for the best results in silver, the other should be put away, only to come out on an emergency, perhaps to make a transparency if thin, or a platinotype print if somewhat dense.

What a nice bit of old-fashioned English scenery! "There stands the broad-wheel'd wain," drawn up at the village inn, the swinging sign-board and water-trough at its base, the wagoner with a foaming mug of ale drinking the landlord's health. How well the three horses (two of them a russet-grey) stand out against the background of trees! Is it to be figures with landscape, or landscape with figures? Decide quickly, for we must interview the wagoner, lest he be off, and, having once started, he cannot turn round to come back with that long length of timber.

A civil word makes it right all round; so we will go for a close-study subject. As they stand, the three horses, one behind the



other, will never do; a foreshortened view will give an inordinate length to the appearance of the team, with the wide-angle lens which we must use to include the incidents of the hostelry and its surroundings. It is well; he will take off the two leaders and let them drink at the trough, while the waggoner—whip in hand—goes through the appearance of a drink with the landlord in front of the house. The rustic ostler boy is to have charge of the drinking horses, so we instruct him as to what he is to do, and that he must not let the horses drink until we are quite ready. He is then to loll over the trough on the left-hand side, well in the foreground (he is a nice, smiling-looking lad, and stands easily and naturally) turned half away from us, and looking across the picture at the group opposite.

So, having got the margins of our picture—the house at the roadside on the right-hand, and the waggon drawn up in front of it, with the figures between, the sign-post and water-trough across the road on the left—it only remains for the two horses to take their places at the trough drinking, which they will do of themselves when allowed; the glimpse of the way out of the village and out of the picture will be suggestive; the sun is on our left, a little to the front, and will cast a shadow of the sign-post and the drinking horses well and definitely across the foreground of the picture. Everything else ready, the boy tumbles to our instructions very kindly, and leads the horses with a halter to the trough, and they at once drink; we are sure they will remain still for ten or twenty seconds, and the boy lolls over the trough just right, as if he were to the manner born. The exposure is made without loss of time, and all appeared to be right. To avoid every sensation or suggestion of the presence of the photographer in our picture has been our first aim. We do not see that there will be any sign of it, unless it be in the grey horse left in the shafts; he was looking at the camera, probably owing to our being the last to speak or to move, but it will not matter. In this instance it is allowable, perhaps an advantage, in getting the spectator to exchange glances with the object which is the centre of attraction (the horse in the team), and then to look round at the surroundings that go to make the picture. There would have been plenty of time to expose another plate, as the horses remained drinking long enough, and we had it ready, hoping that one of them might finish its draught first, and perhaps raise its head over the other's shoulder, and thus the almost exact overlapping of the two horses as they drank at the trough would have been avoided; but the right opportunity did not occur. We are well satisfied however, that all was right—better than usually falls to the lot of the photographer in a studied, if impromptu, design, with improvised materials and untrained models.

The waggoner's luncheon-time has been badly broken in upon by us, so we will ask mine host to let him have a good meal, and this time a real draught of ale, while we apply ourselves to the lunch that the landlord's good wife has provided for us in the little bow-windowed parlour.

## REMARKS ON THE PRINTING-OUT PLATINOTYPE PROCESS.

### OPINIONS OF SOME MEMBERS OF THE CAMERA CLUB.

F. DE P. CEMBRANO, JUN.—As to the "printing-out" process, I cannot say anything about the paper now sold by dealers, as I have confined myself to experimenting in its preparation. I must confess that I have not been able to obtain as good results as with the hot process, nor have I seen anybody else get the rich, velvety blacks obtained with hot development. The tones are good, and it is only when comparing two prints from the same negative (one by the hot and the other by the "printing-out" process) that the difference becomes apparent. The great drawback is the time required for printing, especially when no sun is available, as is so often the case in this country.

For the preparation of the paper, No. 3 formula (Pizzighelli's) is the simplest; but when using a paper specially sized—such as the Platinotype's B paper—the gum may be dispensed with, and this, of course, greatly facilitates the operation of sensitizing. Good results can also be got with paper sized with a little gelatine and chrome alum. The following variations are useful for different kinds of negatives:—

1. To obtain softness, add less chlorate and more of the sodic oxalate and sodic ferric oxalate.

2. To obtain vigour—i.e., when printing from weak negatives—add more chlorate and less of the iron and oxalate solutions.

3. To obtain intermediate tones from black to brown, increase or decrease the chlorate solution, with a corresponding decrease or increase of the mercuric solution.

I think it is rather important to attend carefully to the operation of coating the paper. For this, either a brush, a soft sponge, or a pad of cotton-wool are good; and if the solution be carefully spread on the paper, there will be no need of using a "softener."

The drying operation should be well attended to also. Seven minutes is about the time that should be taken for the whole operation of coating and drying. If it takes longer, the image will be much sunk in. If dried too quickly, it will be too much on the surface, and may wash off partly when using the acid bath. Avoid bubbles when using gum in the sensitizing solution.

A. R. DRESSER.—I have tried it, and think it will be the future paper of amateurs and those who like a grey colour. I have printed about 100 or 150 pieces, and found that when paper was good all went well, but if paper gets damp, it is as bad as damp in the hot process. The first lots I bought were at a photographic chemist's, and they were only sent out in an open black envelope, and nearly all the paper was spoilt by light and damp. The fact is, the paper must be kept dry and in a calcium tin; and so I got my paper subsequently direct from Rudowsky, and have not found a bad piece since I did so.

I think the results got quite as good as with the old platinotype process in all respects, and it is very much nicer to use, as there is no more trouble in dodging and printing-in clouds, than when using silver paper; and as that was the great trouble with platinotype, this paper gains a point in this way. I find it is not easy to get such good black and white results when using a very thin negative; but then, however thin the negative is, you can print it in this paper just as well as in silver, but the resulting print will be flat; for a good black and white print you require a dense negative, but when using a thin negative, you get a grey colour—nice, but rather flat.

There is no need to say anything about directions, as they are so easy that there can be no trouble, if one only follows directions sent out with the paper. Only give two or three baths of acid water in place of one, as stated. I, for one, am very pleased with the paper; and if all future paper turns out as well as that I have used, I shall stick to it, as I find no trouble with it, and find it easy to print.

A. STROH.—My experience respecting the Pizzighelli platinotype process is as yet a very limited one. I have only been able to make a few experiments with it before leaving town, the result of which I must give you with a certain degree of caution. I am very pleased with the process, and I think it has a great future, for nothing can be more convenient than printing to the required depth, followed only by a little washing.

There appears also to be a possibility by this process to vary the character of the resulting prints, depending upon the degree of moisture contained in the paper during printing. When the paper is dry, a much more vigorous print is the result than when it is damp, and I may be right in saying that the paper ought to be kept dry during printing from a thin or flat negative, while an over-developed negative would print better on a damp paper. I find that this paper absorbs moisture very readily, and if one wishes to have it damp, it is quite sufficient to let it lay open, say in the dark room, for an hour or so before placing it in the printing-frame—presuming that it has been kept in a chloride of calcium tube. When it is desirable to print while the paper is in a dry condition, it is necessary to use a vulcanised India-rubber pad behind it while it is in the printing-frame, in order to keep away moisture. This precaution is doubly necessary, a second reason being that the paper expands very much during the absorption of moisture; and if no precautions are taken, the paper expands in the printing-frame, and, under such circumstances, a sharp print cannot be expected. The difference in the length of a whole-plate sheet when dry or wet is about a quarter-of-an-inch. This latter inconvenience can only be owing to the peculiarity of the paper itself, for the paper used by the Platinotype Company (Willis's) does not expand nearly so much, and there may be room for a little improvement in this particular point. I have also noticed that the printing round the edge of a print has a tendency to proceed slower than the rest, but not having had time to observe this more closely, I will not say more about it at present.—From the *Journal of the Camera Club*.



## Notes.

The next exhibition of the Photographic Society bids fair to be an exceptionally good and interesting one for several reasons. In the first place, there will be no particular incentive for the commercialist, who merely desires medals with which to bait his show-case, to exhibit: and this will probably make the exhibition smaller—indeed, it has been much overgrown of late—but with the decrease in the number of exhibits we may hope for more than a proportionate advance in the standard of excellence.

It is also understood that no photographs are to be rejected until submitted to a complete council. That is to say, every member of the council is to have notice as to when and where all those frames are to be seen which have been provisionally placed aside for rejection.

Those thinking of contributing should apply at once for a copy of the regulations and the entry form, to the Assistant Secretary at 5A, Pall Mall East, London. The last day for receiving exhibits is the 19th of the present month.

Briton Riviere, like Meissonier, apparently does not make use of instantaneous photography in his study of animals. "Two hours," the painter recently told a *Globe* interviewer, "is about the limit a dumb beast will sit. Of course, they are in charge of a man the whole time. By various means he entices them into certain positions, and I paint as quickly as possible." Mr. Riviere, it is said, is a very rapid worker. An hour may elapse before the animal may make the movement required, and even then it may only remain in position for a few seconds. In these few seconds the action must be painted. At other times he has to shift his easel to obtain different views. It is impossible not to believe from this that photography would be useful to animal painters. It is said that a horse which acted as a model to Meissonier, who wanted to paint it in a rearing position, died from fatigue; but whether this is apocryphal or not, photography would have secured much that the painter wanted.

In such a position as rearing, or where, as mentioned above, the animal remains in position "for a few seconds," the drawbacks of instantaneous photography do not exist. An artist might with reason say, that an instantaneous photograph of an animal was not of use to him because it secured a momentary appearance inappreciable to the eye, and was, therefore, unnatural. But for an object in repose, though the interval in repose may be of brief duration, the camera is as good as the eye, and has the advantage of preserving its impressions.

Those photographic dealers who exhibited at the Minneapolis Convention have been greatly disappointed with the result. It is admitted that the exhibition of photographic materials was a failure, the attendance being very small, and the sales trifling. We cannot say we altogether sympathise with those who were disappointed. The intro-

duction of the commercial element into a Convention, the objects of which it may be supposed are the interchange of thought and the general elevation of photography, ought to be discouraged. If an exhibition be held for trade purposes, let it be known that this is the case. Exhibitions ostensibly conducted on "high-toned" principles—to use a convenient Americanism—but which are really huge bazaars, are far too common.

The Cyanifer Process for reproducing plans and drawings in deep blue lines has never before been so thoroughly treated of as in the article by Col. Waterhouse which will be found on page 562 of our present issue. The essential advantages of the "blue line" process, over the "white line" process with a blue ground, are that engineers' drawings reproduced by the former method can be coloured so as to indicate material, and that memorandums or directions for working can be readily written thereon.

"Fifty pounds worth of magnesium at a single flash—enough to furnish light to all the photographs in the world simultaneously!" is one of the attractions advertised for the Crystal Palace. The occasion referred to in the advertisement from which we quote (yesterday evening) will be past before the present number of the PHOTOGRAPHIC NEWS is in the hands of the reader, but when there is to be another flash light on a large scale, it would be interesting for some exposures to be made in the grounds.

The Crystal Palace Company, in accordance with the short-sighted and grasping policy for which they are noted, and which policy has been the bane of the Palace, have sold the so-called "right" of photographing in the Palace and grounds to a firm of commercialists, so those who wish to photograph will, we suppose, have no alternative but to take concealed cameras.

The latest use to which the magnesium flash-light has been put, is the photography of the human eye. At the suggestion of Du Bois Reymond, a normal eye, after a quarter of an hour's rest in a darkened room, was photographed life-size, the result being that the photograph showed the pupil of the eye dilated to its fullest extent. As these photographs permit of measurement, they cannot fail to be of great value to medical science.

Amateur photographers who have taken up detective camera work are very much exercised as to what they may or may not do. It is quite conceivable that they may by accident take a photograph which would be very annoying to the persons concerned. For instance, an innocent amateur is present at a Foresters' Fete day, and, attracted by the "bits" of life he sees, surreptitiously takes a photograph of the players in a game in kiss-in-the-ring. Suppose that he secures an interesting picture of Mr. A. in the act of saluting a young lady, which, according to the rules of the game, he is bound to do. Suppose, also, that Mr. A. happens to be married, and that by some round-about process, owing to the smallness of the world, a copy of the photograph falls into the hands of Mrs. A. The question



is, what remedy would A. have? This is the point which the *Boston Courier* of America has been discussing without coming to any practical conclusion. It winds up a series of remonstrances by saying: "The intrusive impertinence of those photographers who take views secretly deserves to be severely rebuked, and it is not likely to be very long before some 'irate subject takes the matter into Court.'" The *Boston Courier* would seem to be in some confusion of mind. The offence is not so much in the secret taking of the photograph, as in the use made of the photograph so taken. A person aggrieved by the injudicious exhibition of a photograph might, we are inclined to think, have the law on his side.

The *Printing Times and Lithographer* has come to the conclusion that the demand for high-class steel engraving is on the wane—photo reproductions of pictures and photographic copies of paintings have seriously affected the market. This, our contemporary considers, is a matter of profound regret, as photography, however good in its way, cannot pretend to reproduce in monochrome the colouring of a picture. Yellows of the purest delicacy come nearly or quite as strong as vivid reds; dark blue has no actinic value, and a white void takes its place in the photograph or photogravure. No doubt the writer of this spoke what he honestly believed to be the truth, but to all those who know anything about photographing pictures, and of the recent advances made in photographic reproduction, it will appear like an exaggeration. It must be remembered that it is only recently that the reproduction of pictures by photography has been made a special study, and it is only reasonable to suppose, from the improvements already made, that faithful rendering of gradations of colour is not an insuperable difficulty.

*Science and Art* advocates the establishment of a court of law for scientific causes—an idea which we have more than once ventilated in these columns. In an experience which a correspondent relates in our contemporary, those photographers who have gone to law on a technical point will recognise a parallel. The correspondent, an East End manufacturer, suggests not only the wiping out of barristers, but the wiping out also of solicitors, and gives his reasons why. He executed an order conjointly with another firm, but when the various parts came to be fitted together it was found there was something wrong. Each claimed to have done his share of the work correctly, and the result was an appeal to the law. At the onset of the proceedings the correspondent of our contemporary suggested to his solicitor that he (the manufacturer) should go and see the other people, but this was strongly objected to, as it was "unprofessional." Accordingly, the case went into Court, and counsel and judge were generally mystified, and finally, not knowing what to make of it, sent the case to a referee. After many delays, owing to the non-appearance of one or the other of the counsel, the writer, seeing his opponent in the room, asked for a few minutes' conversation, and, greatly to the horror of the legal fraternity, had a long conference; the result of which was that they discovered there was no claim for damages against

either one or the other, and that the fault rested with those who had given out the contract. They also discovered that each had been kept from approaching the other by "this stupid legal etiquette, and to enable the solicitors to pile up costs." Whether this last supposition is true we will not say, but it is very certain that when a photographic or any other scientific case goes into the court of law, the ignorance displayed by all the legal gentlemen, from the judge downwards, and the glorious state of confusion into which they speedily get, are most pitiable, and excite the contempt of plaintiff, defendant, and witnesses.

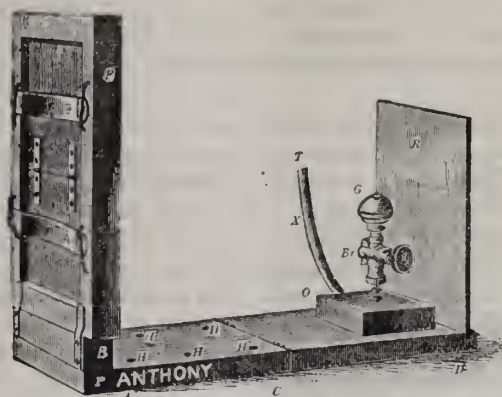
The latest addition to the list of amateur photographic societies is the one just founded at Rome. It is stated to be the first society of this kind which has been formed in Italy. The fact appears to justify the assumption that in Italy, as in other countries, photography is becoming a popular pastime. According to a society journal, the Crown Prince of Italy is said to be the best amateur photographer in his part of the Continent.

#### EXPOSING APPARATUS FOR SLOW BROMIDE PAPERS

BY J. J. ACWORTH.

THE fact that, as far as I know, no such kind of apparatus for making regular and exact exposures by means of artificial light exists, is the reason that I now give a description of such a one designed by myself for the purpose; and I only hope that some of my American friends may find it of as great value for general and experimental use as I have done for some time past. I may state at the outset that the apparatus is only useful for contact printing, and not for enlarging. As a rule, exposures are given in such vague terms that they mean very little, and consequently are very little, for what is intended; for instance, I have heard it said that "paper will require thirty seconds to gaslight," which practically means nothing—whilst exposures given in terms of daylight might be considered absolutely worthless.

Now I think it very desirable that we should as much as possible have a standard exposure to work with. I know there are difficulties in the way; still, I should like to suggest a standard distance from some convenient illuminant—say a fish-tail gas-burner, which I always use for my own work. The distance



might be, say twelve inches, and the burner one burning five feet of gas per hour. If this were taken as a rough, though I think a practical stand, we could then be able to mark on our negatives the exposure to give them in terms of normal when using papers of different rapidities. Some of my negatives I have already marked thus, in terms of the standard I have myself adopted, so that whenever I want a print I am sure of not making a failure—a narrow slip of paper, eighth or quarter of



an inch along one edge, being quite sufficient for the purpose of marking exposures too fine for any paper used. N.B.—The apparatus is quite simple, and the following diagram represents my own.

*A C D* is a piece of mahogany about  $\frac{3}{4}$  inches thick, hinged in the needle so as to fold up if necessary. *B* is a block with spring clips at top to grip the printing frame, *F*. The block *B* is kept in proper position by means of a couple of pins, *P*, passing into holes in the base board, *A C D*. *H H H H H H* are holes in the base-board, *A C D*, to receive the frame carrier *B* at different distances from gas flames, namely at 12 to 10, 8 $\frac{1}{2}$ , and 6 inches respectively; the exposures varying in the ratio of 1,  $\frac{3}{4}$ ,  $\frac{1}{2}$ , and  $\frac{1}{4}$ ; so that, supposing we took 12 inches as the normal distance, and that a gelatine negative of ordinary density required 20 seconds to this size gas flame, then, if we wished to give it a shorter exposure, say one-half, we should simply have to move the frame carrier *B* to the 8 $\frac{1}{2}$  inch distance from burner, and expose for 10 seconds only. The nearer distance becomes more especially valuable, of course, when working with dense negatives, whilst a greater distance than 12 inches may be sometimes necessary when working with thin negatives. *G* is the gas flame, and *Br.* is the burner, which I arrange to disconnect at *O* for sake of portability. The burner is of course supplied with a bye-pass, so as to turn the light up and down instantly. *X* is connecting tubing which follows away at *T*. *R* is reflecting screen of thick white cardboard, which increases the illumination by about 20 per cent., and can be used as required. As can be seen, the apparatus is portable, and can be packed in small compass, and is always ready. In conclusion, I only hope that should others use an apparatus similar to the one I have been describing, they will do so with as much satisfaction as I have done.—*Anthony's Photographic Bulletin*.

#### HOW TO PHOTOGRAPH.—No. 3.

BY THE PHOTOGRAPHIC CRANK.\*

AFTER the negative is completed, the printing is a very simple matter. It is best to get half a dozen printing frames, just as it is better to have a half dozen plate-holders than one. It saves time and bother.

At first the amateur should buy the ready-prepared sensitive paper, but if there is much printing to do, he will find it a good deal cheaper to silver his own paper. Ready sensitised paper costs about 25 cents a sheet. The sheet is 18 by 22.

Very nice amateur pictures can be made with blue paper, which costs much less than silvered paper. The negative is put into the printing frame with the film side uppermost. On this is laid the blue paper, sensitised side down, and then the frame is closed. The combination is put in the strong sunlight, and the picture examined in a shaded place from time to time. When the picture appears pretty plainly the paper is taken out and washed under a tap. That is all there is to it. No chemicals, no toning, no bother. The result is a nice little picture in blue.

The sensitised silver should be fumed before printing, and then printed on as soon as possible after the fuming. A very handy thing to fume a sheet of paper in is one of those wide and long pasteboard boxes which can be had at any dry goods store. The paper is fastened to the lid with pins or tacks, and the bottom of the box is sprinkled over with ammonia. The sensitised surface is placed so as to face the bottom of the box when the lid is on. Half an hour's fuming is enough. Then the paper is cut up into the proper sized pieces and put in the printing frames. The picture can be examined in subdued light. When the print is a good deal darker than you want the picture to appear, it is about right. A rule is to print until the lights in the picture become shaded, or until the shadows are bronzed. There is nothing like practice for learning how to print. After spoiling a lot of paper you will learn something, just as folks do when they start out to write for the papers. The manipulation of the paper must be done in subdued light or by lamplight. It is better to trim the pictures before they are toned. This can be done by getting a glass shape, placing the print face up on a sheet of glass, placing the glass shape on it, and cutting round the edges with a sharp knife.

The toning solution is easily made. A tube of gold contains fifteen grains. One grain will tone a sheet of paper 18 by 22 inches. Break the tube of gold in a little bottle and pour in fifteen drams of water. Each dram will contain a grain of gold.

\* Continued from page 542.

Many professional photographers make up their solutions in the proportion of one grain of gold to sixteen ounces of water, and then put in enough washing soda to make the water feel slippery. In England most of them use acetate of soda with the gold. The beauty of the latter bath is that it will keep, while the others have to be thrown away after using. I use the following toning bath :—

Gold ... ..	1 grain
Water ... ..	16 ounces
Saturated solution bi-carbonate soda ...	10 minims

This should stand for an hour before using.

Bi-carbonate of soda can be bought at any well-regulated drug store. It can be had much cheaper at a grocery under the name of saleratus. A great deal of money can be saved by being posted up on little matters like these. I used to pay ten cents an ounce for chloride of sodium until, to the great regret of the druggist, somebody told me that it was common salt.

The printed pictures must be well washed before being put in the toning bath. After the first washing you will notice that the water is milky. That is the free silver which you have to get rid of before the toning begins.

The only trouble about the toning is to keep the prints from sticking to each other. Keep pulling the bottom print out and placing it on top. Toning ought not to take longer than fifteen minutes. If the bath is warm, the toning is quicker. The prints are done when they are the colour you want them to be. The washed untuned picture will be a brick red. When the print takes on the brown or black photographic tone it is finished. Compare it with an untuned print and you will have no trouble in telling when the toning is finished. After toning, the prints are well washed and put into the hypo bath, similar to that used for negatives, although it is better not to have it quite so strong.

The next washing is the most important, as every trace of the hypo must be removed off, or the prints will fade. Some keep them in a dish under a running tap. The best plan is to keep them in a dish of water, and every now and then pour all the water off and fill up with a fresh supply.—*Detroit Free Press*.

### Patent Intelligence.

#### Applications for Letters Patent.

- 12,307. HENRY RYDER and WILLIAM HENRY RYDER, 38, Vicar Lane, Bradford, Yorkshire, for "Photo-Lithographic Printing and Transfers by Double Photography."—27th August, 1888.
- 12,340. CARL SCHUBÖ, 45, Southampton Buildings, London, for "Improvements in Frames and Stands for Photographs and other Pictures."—27th August, 1888.
- 12,438. FRANCIS BEAUCHAMP, High Cross, Tottenham, Middlesex, for "Improvements in Dark Slides for Photographic Purposes."—29th August, 1888.
- 12,474. LOUIS HOUSARD, 5, Wilmington Square, Clerkenwell, W.C., for "An Improved Shutter for Photographic Camera, being an Improvement in Quickness and Regulation of Speed of Exposure, also being Shakeless in Action."—30th August, 1888.

#### Specifications Published during the Week.

- 11,317. WILLIAM SPIERS SIMPSON, 49, Battersea Park Road, Surrey, Engineer, for "Automatically Lighted Apparatus for the Reception of Coin and the Exhibition and Delivery of Photographs or the like in Exchange therefor."—Dated 18th August, 1887.

The Patentee says :—

The object of this invention is to fit or arrange in or to a casing—containing stereoscopic or photographic views (transparent and other) kaleidoscopic designs, or kaleidoscopic effects, and the like which are intended for exhibition after the insertion of a coin into said casing—an automatic system of producing a light such as an electric lamp, or of a gas or other light lit electrically or otherwise—the reflective power of which light shall give directly upon or through the pictures, or by transfer by reflectors for concentration, or for gradation as desired, said casing having a drawer or slider which can be electrically released for withdrawal, and with it a card, a photograph, or the like, for distribution after inspection of the views.

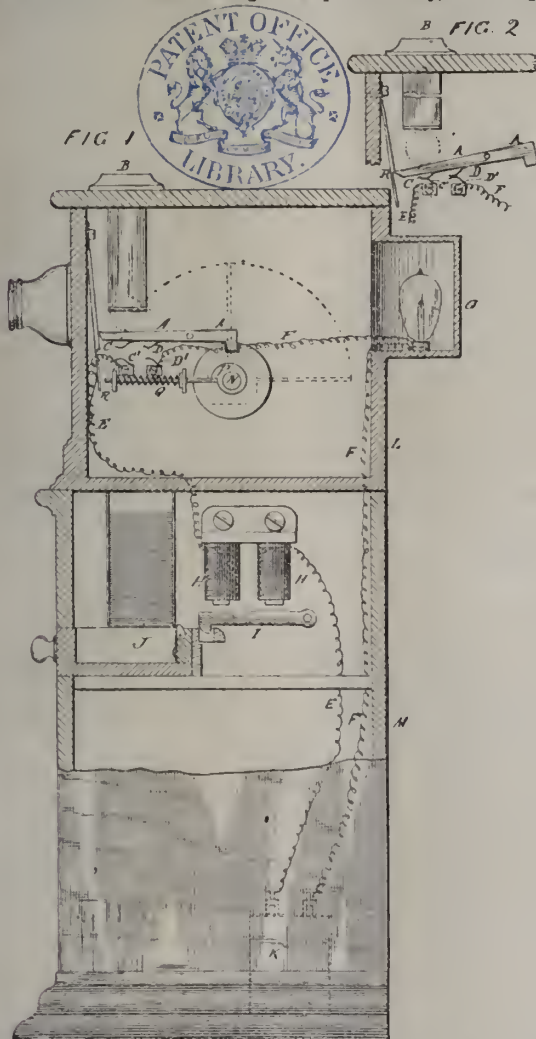
If gas be employed for lighting the interior of the box the spindle of an upper roller, carrying an endless chain having the views attached, may be in connection with an arm of a gas tap



or valve so as to turn the gas on the moment the spindle is turned, the light being established by the electric spark produced by the completion of circuit on the tilt of the trip lever, the gas being turned off at the termination of the complete exposition of the views within the casing; the light required for illuminating the views being about equal to what is known as a pilot light, or from a No. 1 Bray burner.

For the purpose of my invention, which I show in the annexed drawings, I arrange a trip lever A, on to which the coin falls when inserted into a slit B of the casing, with two spring plates C D, figure 1, which come into contact with other plates C<sup>1</sup>, D<sup>1</sup>, having conducting wires E F affixed for making circuit as at figure 2.

These wires, E F, lead to a lantern or lamp G, which lights up the interior of the casing or a portion only, or the light,



particularly if the lamp be suitably arranged, may be reflected by mirror or other reflectors, and capable of adjustment if desired, according to the direction or intensity of the rays.

These circuit wires are also in connection with a coil H, and armature I, which when not attracted by the coil H serves as a locking device to the drawer J. The wires lead from a battery K contained in the casing.

I prefer to arrange the photograph or stereoscopic views or the kaleidoscopic apparatus in what might be termed the coin receiver in one casing L, and the photo deliverer and battery K in another casing M, serving as a pedestal for the support of the first named casing or coin receiver and views exhibitor, but all the appliances may be contained within one casing if desired.

The transparent photographic views to be exhibited are upon an endless band, as in my previous patent No. 15,000 of 1886,

to be turned by hand, or it may be by clockwork, but preferably by hand, and on the insertion of a coin the long end of the trip lever A is depressed by its weight, which forces the nose of the trip lever under the catch of a spring plate R, whereby the trip lever is temporarily locked, the coin simultaneously falling from the trip lever, leaving the trip lever in a locked position. The spindle N is then free to be turned by hand, and with it a wiper cam P, which, as it moves round, pushes a bolt Q towards the spring plate R, so that at each complete rotation of the upper spindle all the pre-arranged number of views have been exposed, and the bolt Q forced against the spring plate R in order that it may lose its grip of the lever A, the lever then recovering itself under the action of its spring plates C D, and so lock the roller by its opposite end falling in a notch of the roller. This separates the spring plates C D from the contact pieces C<sup>1</sup> D<sup>1</sup>, and breaks electrical contact, and the light is switched off. It is only on the introduction of a fresh coin of a pre-determined size or weight that the lever A can be again depressed for re-establishing electrical connection. When the lever A is depressed, the coin slides from it into the lower part of the box L.

Having now particularly described and ascertained the nature of this invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. The employment of an electric lamp in a coin receiver apparatus in which transparent photographs mounted on an endless frame are exhibited in fixed number, and the means by which the exhibit is closed up, and the coin-receiving lever released, all as hereinbefore described and shown in the annexed drawings.

2. The particular combination of appliances constituting an apparatus shown on the annexed drawing, within which, after the insertion of a coin, an electric lamp can be lighted up, transparent photograph views be moved for exhibition, a drawer released, and a photograph removed from a pile, as set forth.

13,186. JAMES MEIN ELLIOT, of Westwater, Langholm, Dumfriesshire, Farmer, for "Improvements in and connected with Diaphragms and Shutters for Photographic and other Lenses or Cameras."—Dated Sept. 29th, 1887.

The Patentee says:—

My invention has reference to a new or improved construction of combined movable spring diaphragm and shutter mechanism, for giving a larger or smaller opening, and instantaneous closing and exposure at will, or give a longer exposure by regulating the time during which the diaphragm shall remain open; and which might be made portable for inserting into a slit in the metallic case of and between the lenses, or be mounted in or on the camera in front of the lenses.

And in order that my said invention, and the manner of performing or carrying the same into effect or practice, may be properly understood I have herewith appended an explanatory sheet of drawings, in which the same reference letters are used to indicate corresponding parts in all the figures were shown.

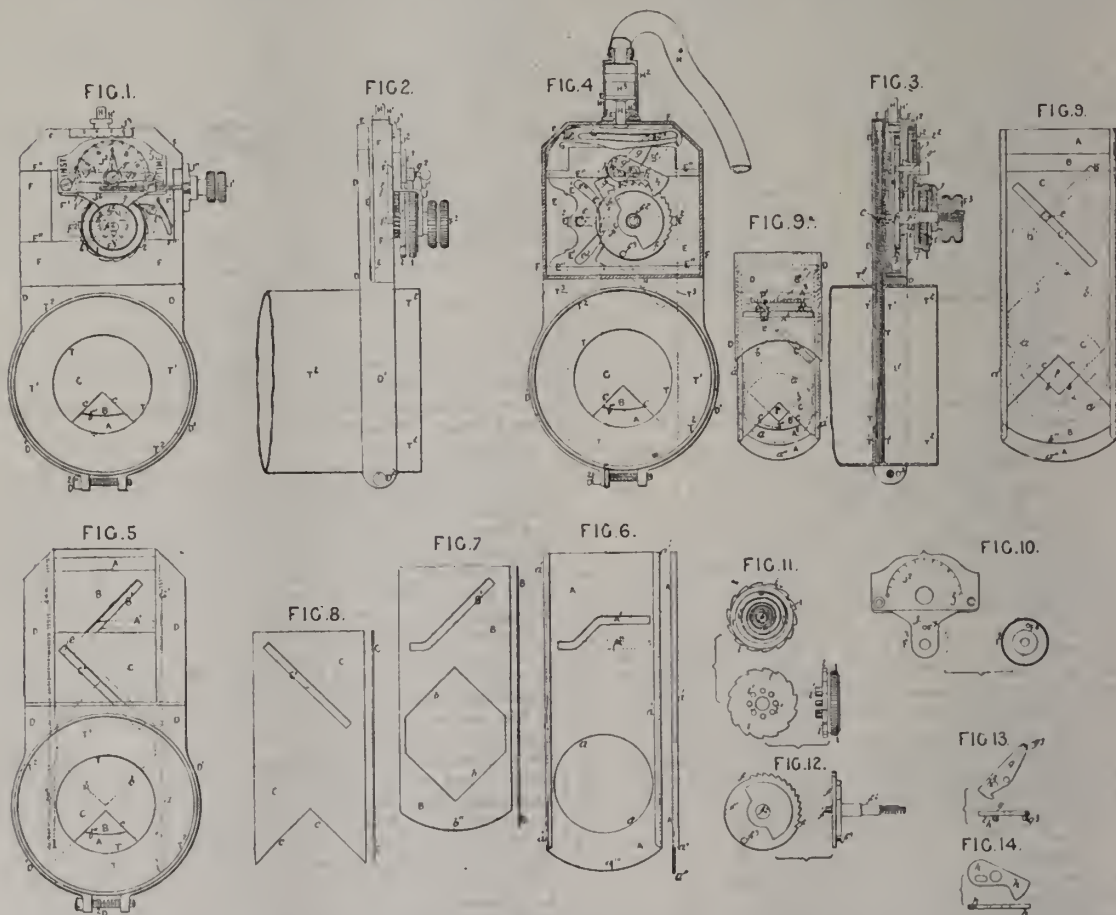
Figures 1 and 2 show a front end and edge view respectively of this new spring diaphragm mechanism, as mounted on the front tube T, T<sup>1</sup>, of camera lenses. Figure 3 is a vertical edge section through the diaphragm mechanism, corresponding to fig. 2, and fig. 4 is a front section corresponding to figure 1, showing the internal mechanism within the fixed slide case F. Figure 5 shows a like end section through the inner diaphragm slide case D, with central slide plate E removed. Figures 6, 7, and 8 show front, side, and edge views respectively of the slide case A, and of the movable slides B, C fitted within the former; and figure 8 shows a front view of the slides over each other, but as detached from their case D, with the aperture of the diaphragms B C, dotted in in different positions to show different sized apertures formed by these at t. Figure 10 shows a front view of the dial plate J<sup>2</sup>, and milled screw J detached, which is mounted outside on the sliding plate F<sup>1</sup>, as seen in figure 1. While figure 11 shows the opposite end views and an edge view of the spring-barrel I; and figures 12 show an end and edge view of the ratchet crank pin wheel f f<sup>1</sup>. And figures 13 and 14 show front and edge views of the ratchet retaining pawl lever g and the stop lever h respectively.

Referring to these figures, one arrangement of my improvements—suitable for being inserted in the slot T, of the tube T, of the lenses as common diaphragms are—consists in mounting within the guide edges a<sup>1</sup>, of a thin metallic plate case A, two very thin diaphragm plates B C, close together over each other as seen in figure 9, and as seen in side and edge view detached



in figures 6, 7, and 8 respectively, with a square or equivalent angled recess or hole  $b\ c$ , in both plates  $B\ C$ , and a round hole  $a$  in the plate  $A$  arranged (when the case  $A$  is inserted into the slit  $T$  in the tube  $T^1$  of the lenses) so as to be in the centre radial line or hole  $t$  of the lenses, and the ordinary open diaphragm circle  $T$ , formed in this case by double rings  $T^1\ T^2$ , within the projecting end of the lens tube  $T^2$  with the said narrow space between them for the insertion of the case  $A$  with the diaphragm plates  $B\ C$  down from an open slot at  $T^3$  in the top. The case  $A$  and plates  $B\ C$  are all mounted with their moving mechanism to slide in a groove in the inner frame case  $D$  within the case  $D\ E\ F$  over the slot  $T^3$ , and secured by a spring band  $D^1$ , and pinching screw  $D^2$  round the outside of the tube  $T^2$  all as seen particularly in figures 1, 2, and 3, and which I term the "Iris" form of diaphragm. The plates  $B\ C$  are formed at their upper ends with two parallel slots  $B^1\ C^1$ , one in each plate crossing each other at any suitable angle, but preferably

at an angle of  $45^\circ$  within the working case  $A$  and  $D$ , but outside the tube  $T^2$  of the lenses, where the actuating mechanism is fitted within an enclosed part of the case  $E\ F$ , in front of the said case  $D$ , and thin guiding case  $A$  of the sliding diaphragms  $B\ C$ , and which allows room for these diaphragm plates to traverse on each other, the one  $C$  down and the other  $B$  up, in closing the opening  $t$  in line with the centre of the lenses to any desired degree, or entirely through these plates  $B\ C$ , or *vice versa* to open them up as shown dotted-in in figure 9, by the action of a pin or stud  $e$  working in the said angled crossing slots  $B^1\ C^1$ , and secured in a transverse reciprocating frame  $E^1$ , working in parallel guides  $E^{11}$ , with the pin  $e$  working through the transverse slot  $E^2$ , in the plates  $E$ ; and when the case  $A$  is not required to move as a slide through the angled slot  $A^1$  the pin passes through a corresponding transverse slot  $A^1$ ; in this case  $A$  also shown dotted-in in figure 6, and in the case  $D$  in figure 9  $A$ ; but when this case  $A$  is desired to move as a slide, it



would have an angled slot  $A^1$  to move it, equivalent to  $B^1$  and  $C^1$  in the plates  $B$  and  $C$ , as shown at  $A^1$  in figure 6. The size of aperture  $t$  is thus regulated by the distance traversed by the stud  $e$  from right to left, or *vice versa*, to close or open the diaphragms respectively, by the stud  $e$  working through in their angled grooves  $A^1\ B^1\ C^1$ , as will hereafter be described. This reciprocating stud-frame  $e\ E^1$  is actuated to and fro by a segmental ratchet wheel  $f$ , with a crank pin  $f^1$  in it, this pin  $f^1$  working in a curved slot  $c^1$  in the said traversing frame  $E^1$ , preferably nearly tangential to the motion of the crank pin  $f^1$  near the centre  $c^1$ , in the position it is shown in figure 4, causing the motion more towards the outwardly curved ends  $c^2\ c^{11}$ , of this slot  $c^1$  respectively in opening and closing the diaphragm or shutter plates  $B\ C$ . The first quarter turn or so of the wheel  $f$  and crank pin  $f^1$  gives the extreme lateral action to the stud  $e$  working the diaphragm plates  $B\ C$ , so as to traverse and open them vertically; a spring pawl setting and releasing lever  $g$ , retaining the ratchet wheel  $f$  and crank pin  $f^1$  and frame  $E^1$  in any position they are set to by

the spindle  $f^2$  of the ratchet wheel  $f$ . The spindle  $f^2$ , carrying the ratchet wheel  $f$  on its inner end, is passed out through a slot  $F^2$  (parallel to the slot  $E^2$ ) in the plate  $F$ , and carried in bearings on the transverse slide frame  $F^1$  fitted to traverse in guides  $F^{11}$  in the frame plate  $F$  outside, and which also carries the bearing of the fulcrum spindle  $g^1$  of the spring ratchet pawl  $g$  and a releasing stop lever  $h$  mounted on it. The spindle  $f^2$  of the ratchet wheel  $f$  is wound up and set with the diaphragms  $B\ C$ , in their closed position as described in reference to figure 4 ready for being let go to open and close the diaphragm  $B\ C$ , by the power of the spring  $I^1$ , in the barrel  $I$ , by a milled head  $F^3$  secured on it outside, in the centre of the transverse slide  $F^1$ . The spring barrel  $I$  is mounted loose on this spindle  $f^2$  with a milled head and a ratchet wheel  $i$  with spring pawl  $i^{11}$  on the slide frame  $F^1$ , for retaining the spring barrel at  $I$  in the position it is wound up to; the transverse slot  $F^2$  being formed in the frame  $F$  below the slide  $F^1$  for allowing this spindle  $f^2$  and ratchet wheel  $i$  outside to traverse to and fro with the slide  $F^1$ .



This slide  $F^1$  and outer plate  $J^2$  are set to any position transversely to the right, as shown in figure 1, to give the extreme opening desired for the time being by the screw spindle  $J$  with milled head  $J^1$  secured by its bearing plate  $J^{11}$  to the side of the slide case  $F$ , and works in a screw bush at  $J^{111}$  fixed on the index plate  $J^2$  carrying the index pointer of the index  $J^3$  divided on the top of the fixed plate  $F$ , as shown in figure 1, and which regulates the throw of the crank pin  $f^1$  in the groove  $e^2$  of the slide frame  $E^1$ , and the distance traversed by this lateral sliding frame  $E^1$  and stud  $e$ , which moves the diaphragms  $B$   $C$ , to open them, and close them while the crank pin  $f^1$  is traversing in the upper end  $e^{11}$  of the groove  $e^1$  and moving the frame  $E^1$  to the left in figure 4. The index  $J^3$  is formed at the top of the plate  $F$  with a pointer on the plate  $J^2$ , secured to the slide plate  $F^1$ , to show the degree of opening it is set to by the screw  $J$   $J^1$ . The small spindle  $g^1$  of the ratchet pawl lever  $g$  has a crank handle  $g^2$  mounted on it above the spring barrel  $I$  outside the index plate  $J^2$ , which also carries the outer bearing  $j$  of the spindle  $f^2$ , the spindle  $g$  being also passed through a lateral shot at  $j^2$  in the fixed slide plate  $F$ , seen more particularly in figure 1, with a small eccentric cam  $h^1$  on its inner end working in an eye in the stop lever  $h$  fulcrumed by a slot on a pin at  $h^2$  in the spring pawl  $g$  of the internal ratchet wheel  $f$   $f^1$ , for letting go the ratchet wheel  $f$  for giving either instantaneous action to open and close the diaphragms  $B$   $C$ , or give a pause to retain the diaphragms open for any desired time by this stop lever  $h$  and a pin  $f^2$  on the back of the ratchet wheel  $f$ , according to the position the crank handle  $g^2$  sets the cam  $h^1$  to, for the time being, either out of or into action, the thumb-screw  $J$   $J^1$ , and the position of the slide  $F^1$   $J^2$  giving and showing the amount of opening on the index  $J^3$  as described. The rapidity of the action of the internal ratchet crank pin wheel  $f$   $f^1$ , and motion in opening and closing the diaphragms  $B$   $C$ , is effected by the strength of the spring  $I^1$  for the time being, which is coiled up more or less by the milled head of the spring barrel  $I$  outside, which also carries a tooth pinion shown as formed with pin teeth at  $i^{11}$ , shown in the views of the ratchet barrel fig. 11, and gearing into the spur wheel  $i^2$  mounted loose on the eye or bush of the spindle  $g^1$ , with pointer  $i^3$  passing over the segmental index on the outside of the plate  $J^2$ , and which by the divided index and pointer shows the strength of the spring  $I$  wound up for the time being, "instantaneous" being printed at the one side of the dials  $J^2$ , and "time" at the other, and consequently indicates the instantaneous or regulated time. A slotted spring lever  $G$  is mounted and fulcrumed at  $G^1$  inside the fixed slide case  $F$ , over a pin  $g^2$  in the actuating end of the releasing and retaining pawl  $g$  of the internal exposure ratchet wheel  $f$ , with a small spindle  $H$  passing up a screw or airtight socket  $H^1$  on plate  $F$ , and carrying a pneumatic cylinder  $H^2$  above. This spindle  $H$  is shown as fitted with a piston  $H^3$  over it, working into the cylinder  $H^2$  above, screwed to the socket  $H^1$ , the cylinder  $H^2$  having a small india-rubber tube  $H^4$  attached to it, with an air-ball not shown in the drawings, so that the operator might, by the compression of the air-ball in his hand, instantaneously press down the piston  $H^3$  and rod  $H$ , and press down the releasing lever  $G$  and ratchet pawl  $g$  to let go the ratchet wheel  $f$ , at the proper time to open and close the diaphragms  $B$  and  $C$ , all as described. When the instrument is to be used or set for a time exposure, the crank pin ratchet wheel  $f$   $f^1$  is wound up by the milled head  $F^3$  on its spindle  $f^2$  outside, so as to set the shutter slides  $B$   $C$  ready for action, when the outside hand-lever  $g^2$  and its eccentric  $h^1$  is then turned to the position to bring the time-stop lever  $h$  into action, as shown to the right in figure 1, and its lever  $h$  in position in figure 4 to stop the ratchet wheel  $f$ , by the pin  $f^3$ , so that by the first pressing down of the releasing pin  $H$  and lever  $G$  and ratchet pawl  $g$ , the ratchet wheel  $f$  and slides  $B$   $C$  would be stopped in their open position by the lever  $h$  and pin  $f^3$ , and another motion of the lever  $g^2$  and eccentric  $h^1$  would be necessary to lift the lever  $h$  and release the pin  $f^3$ , and close the slides  $B$   $C$  when the proper time of exposure was given. But the ratchet wheel  $f$  might be made without this tooth or stop  $f^3$  for retaining it in the open position, in which case the mere releasing of the pin  $H$  and lever  $G$  and the ratchet pawl  $g$  would allow the ratchet  $f$  to turn the diaphragms  $B$   $C$ , and close as well as open these. A pin  $F^4$  on the under side of the large milled winding head  $F^3$ , by coming in contact with another pin  $F^5$  in the upper bearing  $j$  of the plate  $J^2$ , would prevent the crank and ratchet segmental wheel  $f$   $f^1$  making more than one revolution, and leave it all ready

for re-winding up the spindle  $f^2$  and spring  $I^1$  within the ratchet spring barrel  $I$ .

In figure 9  $A$  is shown a front view of a slight modification of the sliding diaphragm plates from that shown detached in figures 6, 7, and 8, in which a third sliding diaphragm plate  $A^2$  is used with a round hole  $a^2$  in it similar to the slide plate  $A$ , having an angled slot  $A^3$  in it; which arrangement has the advantage of requiring less width of cover at the lower ends  $a^{11}$   $b^{11}$  in the plates  $A$  and  $A^2$  and  $B$ , for their motion within the ring  $T$ ,  $T^1$ , of the tube  $T^2$  of the lenses, as the plates  $A$  and  $A^2$  move up with the plate  $B$  to close the space below the diaphragm  $B$  when it is closing the aperture  $t$ , and *vice versa* move down with the plate  $B$  to give the full aperture, with a less proportionate motion of the added plates  $A$ ,  $A^2$ , as will be seen from their angled slots  $A^1$   $A^3$ . Thus referring to figure 9  $A$  it will be seen that the moving pin  $e$  traversed transversely by the lateral slide pointer  $P$  through the fixed transverse slot  $A^{11}$  in the frame  $D$  works through the diagonal angled slots  $B^1$ ,  $C^1$ ,  $A^1$ ,  $A^3$ , in each slide  $B$ ,  $C$ ,  $A$ ,  $A^2$ , to move it to its desired extent either up or down to close or open the aperture  $t$  in the plates. The traverse of the pin  $e$  from the starting end, when all the diaphragm plates are close, works in the diagonal slot  $C^1$  in first diaphragm plate  $C$  to raise its lower opening end  $c$  from the close central point of the lenses for the largest opening upwards desired. While the second diaphragm plate  $B$  would have the pin  $e$  working through the diagonal slot  $B^1$  in it, formed in the reverse direction to the former plate  $C$ , so as to be traversed proportionally downwards to the upward traverse of the first diaphragm plate from the centre of the lenses to the full extent of the largest opening required during the maximum transverse motion of the pin  $e$  and pointer  $P$  in the transverse groove  $A^{11}$ . Then the third diaphragm plate  $A^2$  would be made with a shorter diagonal slot  $A^3$  towards the beginning of its traverse in the same direction as that in the second diaphragm plate  $B$ , so that the pin  $e$  would move it down a proportionate shorter distance along with the second diaphragm plate, and have the slot curved or bent into a horizontal direction to allow the pin  $e$  to traverse to its maximum extent without opening this diaphragm plate further. While the fourth diaphragm plate  $A$  would have a still shorter diagonal slot  $A^1$  than that of the third diaphragm plate  $A^2$ , and a longer horizontal part of its slot  $A^1$  at the end, and be moved a shorter distance downwards simultaneously with the second and third diaphragm plates, to give the full opening downwards, the lower ends of the two latter plates overlapping with each other, and with the second diaphragm plate  $B$  at their lower ends, all so as to fill up in all positions of the diaphragm plates the open space between the lower end  $b^{11}$  of the second diaphragm plate  $B$  and the large open annular rings  $T$  on one or both sides of the sliding diaphragm plates of and within the case of the camera lenses. This diaphragm or diaphragm shutter shown in figure 9  $A$  may be portable and removable from the diaphragm slit  $T^3$  in the lens case  $T^1$ ,  $T^2$ , and have a pointer  $P$  on the slide of the moving pin  $e$ , and index figures  $P^1$  on the upper part of the plate  $D$  and transverse slide  $A^{11}$ , indicating the size of opening of the diaphragm, so as to set the diaphragm plates to any size of opening without requiring to withdraw the diaphragm from its slit  $T^3$  to suit the strength of light and photograph to be taken. In this way any required number up to five or six sliding shutters, to give the same effect, might be moved in an equivalent manner in their guide frames  $A$  or  $D$ .

These shutters and their mechanism may also be made duplex for stereoscopic work, that is one mechanism being made to work the diaphragms of two lenses simultaneously, when the lenses are within a few inches of each other, as by making the diaphragm plates longer, and having suitable apertures or openings at each end, and with the actuating diagonal slots in the centre as described, so that when the diaphragms of the one lens were actuated by its mechanism it would actuate the diaphragms of the other lens.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

First. The construction or general arrangement and combination of the parts of diaphragms or shutters, and their spring automatic actuating mechanism for photographic and other lenses or cameras, substantially as herein described, in reference to and shown in the accompanying drawings.

Second. In diaphragm and shutter mechanism for photographic and other lenses or cameras, the mounting and use of thin reciprocating plates formed with diaphragm apertures, and reverse angled slots at their outer ends, and traversed on each



other by a lateral reciprocating slide and pin, to open and close respectively, the diaphragm aperture to the extent desired, substantially as and in the manner herein described in reference to and shown in the accompanying drawings.

Third. In diaphragm and shutter mechanism for photographic and other lenses or cameras, the actuating of the vertically reciprocating diaphragm plates, whether of this iris or other form of diaphragm shutters, by a pin and horizontally-traversing slide frame, operated by a crank pin working in a curved or double angled slot in it, for the opening and closing of the shutters and aperture, said crank pin being formed on a segmental ratchet wheel, actuated substantially as and in the manner herein described, in reference to and shown in the accompanying drawings.

Fourth. In diaphragm and shutter mechanism for photographic and other lenses or cameras, the mounting of a spindle and crank handle above the spring barrel, said spindle being passed through a lateral slot in the fixed slide, with a cam working in a slot in a stop lever, fulcrumed behind the spring pawl of the internal ratchet wheel, for letting go the ratchet wheel to give either instantaneous action to open and close the diaphragms, or give a pause to retain the diaphragms open for any desired time, by said stop lever, and a pin on the back of the ratchet wheel, substantially as and in the manner herein described in reference to and shown in the accompanying drawings.

Fifth. In diaphragm and shutter mechanism for photographic and other lenses or cameras, the releasing of the retaining pawl lever which works the automatic spring mechanism for opening and closing the diaphragms, by a pneumatic piston and cylinder, operated by an air-ball, substantially as and in the manner herein described in reference to and shown in the accompanying drawings.

13,505. JAMES HENRY JEFFERIES, of 26, Saint James's Square, Wolverhampton, in the County of Stafford, Engineer for "Improvements in Apparatus for Washing and Drying Photographic Negatives and Photographic Pictures on Glass, part of such Improvements being applicable also for Washing Photographic Prints."—Dated October 5th, 1887.

A washing trough with a special arrangement of racks for the plates, and a floating valve for allowing the water to run out periodically.

13,762. JAMES BRIDLE CUMING and WILLIAM WILLS, both of Nos. 4 and 5, Love Lane, Wood Street, in the City of London, Umbrella and Sunshade Manufacturers, for "Improvements in the Application of Photography to Silk, Satin, Cotton, and other similar Fabrics."—Dated 11th of October, 1887.

The Patentee says:—

Our invention consists in the application of photography to silk, satin, cotton, and similar fabrics; and its object is to use such fabrics in the manufacture of various articles of utility and ornament. Now, in order to carry out our invention, we take, or cause to be taken, a view or picture of any suitable subject by any well known system of photography, and afterwards by any ordinary process of photographic printing, we print or impress such view or picture upon any kind of silk, satin, cotton, and like fabrics.

We are aware that photographic printing has before been applied to woven fabrics, but the essential feature of novelty in our invention is that such printed fabrics are used in the manufacture of and as the covering material for umbrella screens or fans, sunshades, gas shades, lamp shades, and articles of a like nature.

Accordingly, a sunshade or umbrella manufactured according to our invention has a similar framework, and the covering material thereof is gored or divided in the same way as an ordinary sunshade or umbrella. But in each or all of these gores we propose to have one, two, three, or any number of views or pictures, produced and printed by any photographic process, of any subject or subjects that may be desired, arranged in such a manner that the face of the view or picture shall be on the inside or on the outside of any gore made in the covering material of such sunshade or umbrella. Or, we may arrange such view or picture so that its face shall be on the inside of one gore, whilst the face of another view or picture shall be, in the next succeeding or any other gore, on the outside; and so on alternately, if so desired, throughout all the gores of the covering material of the article manufactured.

It may be found possible to print two such views or pictures on the same gore—that is to say, one on the inside, and another on

the outside—but we prefer to have only one picture or view on one gore, either on the inside or on the outside, as being more convenient, effective, and practicable.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is—

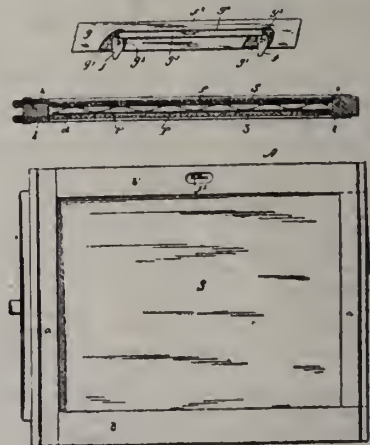
In the manufacture of umbrellas, screens, or fans, sunshades, lamp shades, gas shades, and other similar articles, the use of a covering fabric which shall have one or more pictures or views printed thereon by any photographic process, substantially as and in the manner and for the purpose hereinbefore set forth.

#### Patents Granted in America.

388,271. GEORGE EASTMAN, Rochester, N.Y., assignor to the Eastman Dry Plate and Film Company, same place, for "Photographic Plate-holder."—Filed October 1, 1887. Serial No. 251,218. (No model.)

Claim.—1. In a plate-holder such as described, and in combination with its grooved and flanged side bars, movable dogs or clamps supported upon the flanged side bar, and devices connecting said dogs for simultaneously projecting them over the edge of the plate, or withdrawing them at will, substantially as described.

2. A plate-holder such as described, consisting essentially of an open frame composed of end and side pieces grooved near opposite faces for the accommodation of slides or shutters, one



of said side bars being provided with a longitudinal groove intermediate the two shutters, and the other with a flange and co-operating plate-holding dogs, substantially as described.

3. The combination, in a plate-holder such as described, and with the side bars, the one grooved, and the other provided with a shoulder or flange and locking dogs, of the plates and interposed elastic cushion or pad, the whole resting at one edge in the groove of one side bar, and at the opposite edge between the flange and dogs on the other side bar, substantially as and for the purpose set forth.

4. In a plate-holder such as described, the combination, with the recessed side bar, of the pivoted dogs and connecting bar, and the covering strip or plate, substantially as described.

5. In a plate-holder such as described, the combination, with the recessed side bar provided with a shoulder or flange to receive the edge of the plate, of the dogs pivotally supported in the recesses, the connecting bar with thumb-piece or handle, and the top or outer section applied to the side bar to cover the dogs and form a groove or way for the exposing slide, substantially as described.

#### Correspondence.

##### ORTHOCHROMATIC PHOTOGRAPHY.

DEAR SIR,—Mr. Vero C. Driffield, p. 511, says: "I am disposed to think that an orthochromatic result can only be obtained by means of a yellow screen, and that, with this adjunct, any sensitive plate will yield orthochromatic results."

That ordinary sensitive plates will *not* give "orthochro-



matic results" by exposure through a simple yellow colour-screen is a clearly established fact. Photographs that are made in this way show bright yellow and green almost exactly alike, orange quite dark, and red like black. The same plates, exposed through the same screen after they have been sensitized in the most perfect manner with cyanine, will show red and green lighter than blue, orange lighter than green, yellow lighter than orange, and white lighter than yellow.

I have made correct colour-value photographs on ordinary plates by the use of a special compound colour-screen, as described in the *Journal of the Franklin Institute* for June, 1886; but the exposure necessary to accomplish this was at least a hundred times longer than it would be with a perfect cyanine plate and yellow screen. With collodion bromide emulsion plates the use of a colour-sensitizer is absolutely essential; they will not give "orthochromatic results" with any amount of exposure through any kind of a screen.

There is nothing new in all this, but it appears to be necessary to repeat some photographic facts a great many times before they are recognized.—Respectfully yours,  
Philadelphia, Aug. 20, 1888. FRED. E. IVES.

## Proceedings of Societies.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The ordinary weekly meeting was held at Mason's Hall Tavern on the 31st ult., H. M. HASTINGS in the chair.

H. STARNES, remarking upon the confusion arising frequently from using plates of different degrees of sensitiveness, showed a cardboard dial he had devised. Divisions on the dial were made for different hours of the day, with a table of exposures, according to the sensitometer number of the plate used. A pointer attached to the dial being placed at the hour of the day at which the plate is exposed, furnished all the necessary information to regulate exposure.

W. CONN said tables of this kind were not always to be relied upon, as it was a well known fact that two plates of the same sensitometer number would require different exposures in the camera.

S. J. B. WOLLASTON passed round the plates he had referred to at a previous meeting as giving green fog, after being for some time in a friend's dark slide, plates from the same box otherwise developing quite clear. He had no doubt whatever that the dark slides were the cause; he attributed it to their being packed in the hold of a ship, and getting impregnated with foul gas. He would like to hear suggestions for a remedy.

The CHAIRMAN suggested that the slides should be exposed to chlorine gas, and then kept in the open air for some time.

A. HADDON said if the slides were impregnated with sulphuretted hydrogen it could easily be detected. A simple test might be applied. A piece of paper saturated with a solution of acetate of lead, if kept in the slides for a short time, would change to a brown colour if the gas was present.

Mr. WOLLASTON had brought an unexposed plate down to the meeting with him which had been in his friend's slide for a fortnight. It was decided that one of the members should expose this plate, that it should be cut into four parts, and developed by as many members, and the results brought to the next meeting.

J. B. B. WELLINGTON exhibited some plates showing green fog to such an extent that from their opacity it was quite impossible to print from. They had been developed by a professional. He had since tried some from the same batch which developed quite clear. In each case the developer consisted of three grains of pyro to the ounce, with carbonate soda and carbonate potash used separately.

The subject announced for discussion, "Lantern Condensers," was then resumed.

J. TRAILL TAYLOR said condensers must be divided into three classes:—1st. Those of optical perfection; 2nd. For lantern projection; 3rd. Ordinary bulls-eyes. A condenser proper consisted of two facts, collecting and condensing, brilliancy depending upon the angular aperture of the collecting system. This should be made from glass as dense as possible, a system of lenses being necessary to overcome spherical aberration;

it was important that these should be of colourless glass throughout, the green glass in the cheaper forms causing degradation of light. A common form of condenser in the market consisted of two plano-convex lenses, but it was not the best. A meniscus and bi-convex lens was a better combination. Some time ago he was engaged in a series of experiments, the outcome of which was a form of condenser that gave excellent results. This consisted of a plano-convex lens and a bi-convex lens, with unequal curves in the proportion of 2 to 13. Between this combination and the radiant a thin meniscus lens two-thirds the diameter of the condenser is mounted, the exact distance this should occupy being the result of experiment. This lens should be of dense glass, and perfectly colourless. The radiant with this system could be placed very much nearer the condenser; the meniscus lens would necessarily get intensely hot, but if not made too thick no harm would be done to it.

F. A. BRIDGE said this form of condenser would not admit of several effects being produced where the slide had to be placed behind the condenser.

W. H. HARRISON said Sir Robert Ball, the Astronomer-Royal for Ireland, used a similar system to that recommended by Mr. Taylor; the meniscus lens in this case, being mounted on rods, was capable of adjustment.

### PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

The Committee of this Association met on 30th August. The minutes of the previous meeting having been read and confirmed, F. Woodroffe was elected a member of the Association; the Committee then had under consideration the third application for assistance this month, and made a grant to meet the case.

### LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

A MEETING was held on August 30th, in the Royal Institution, Colquitt Street, B. J. SAYCE in the chair.

Dr. J. B. Edis and T. H. Ashcroft were unanimously elected members of the Association.

The PRESIDENT made a feeling reference to the late E. P. Houghton, one of the founders and original members of the Association twenty-five years ago, and ever since a popular and influential member, his death being a distinct loss not only to this Association, but also to the city at large.

Mr. SAYCE also referred to the non-presentation of the Exhibition accounts, and stated that, as the papers are in the hands of the auditors, a report will be presented without further delay.

W. P. RILEY exhibited a number of charming prints on Pizzighelli platinum paper, some of them being equal to the most brilliant developed platinum prints. He advised members to varnish all negatives before using this paper.

The PRESIDENT stated that bright negatives were the most suitable for this, as for any other process of printing, as a slight veil in the negative materially increased the time required to produce a print.

F. EVANS found that the commercial samples of the paper varied both in speed and quality, one batch printing very slowly, while a second printed just as quickly; some of the paper being also thicker than others.

The PRESIDENT congratulated the publishers upon the new "International Annual."

During the discussion upon "Hydroquinone,"

B. BOOTHBY strongly recommended its use with Eastman's paper, being stable, reliable, and of continuous action, and did not interfere with the stripping qualities of the paper.

A. W. BEER warned members of the liability of metabisulphite of potash to decompose when made up in a strong solution with pyro.

## Talk in the Studio.

VISITORS TO MUSEUMS.—The Rev. H. H. Higgins divides such visitors into three classes: students, observers, and loungers. The students—who form, perhaps, 2 per cent. of the total—are those who go with a definite purpose, seeking the solutions of questions which have occurred to them during reading or reflection. The observers, who may range from 50 to 75 per cent., have no conscious definite object, but fix their attention



with more or less intelligence on the specimens displayed, and generally carry some knowledge away with them. The loungers go to spend time, especially as the museums are places which "one must have seen." They are most numerous at South Kensington.—*Scientific News*.

**META-BISULPHITE OF POTASH.**—Speaking of the salt sold under this name, the *Scientific American* says:—"This salt has been recommended as a substitute for sulphite of soda in preserving pyrogallie acid in solution. This salt is  $K_2S_2O_5$ , while bisulphite is  $HKSO_3$ , and is prepared by supersaturating a rather strong solution of carbonate of potash with sulphurous acid, and precipitating with absolute alcohol. A white acicular mass of crystals is obtained, which must be collected on a filter and washed with absolute alcohol. The salt has an unpleasant sulphurous taste, is neutral to test paper, and slowly evolves sulphurous acid in the air. Doubtless this slow evolution of sulphurous acid takes place and preserves pyro. According to the system of nomenclature at present in most general use, the salt in question should be called 'Anhydrosulphite' of potassium."

**POLITICAL LANTERN LECTURES.**—The *Daily News* says:—"Mr. Noble has now added magic-lantern illustrations to some of his lectures, in order to impress more vividly upon his audiences the political views it has so long been his mission to proclaim, and among his subjects for the coming season are the 'Irish Question,' the 'Life and Work of Mr. Gladstone,' the 'Story of the Anti-Corn Law League,' 'Great Events in History,' &c. The value of the magic lantern as a supplementary educator has long been known to men of science, temperance reformers, and others, but its application to politics is a comparatively new departure."

**REFRACTION OF LIGHT BY ICE, AND BY WATER COOLED BELOW ZERO.**—By C. PULFRICH (*Ann. Phys. Chem.* [2], 34, 327–840.—The fact that whilst water attains its maximum density at a temperature of  $4^\circ$ , its index of refraction decreases continuously from  $0^\circ$  to  $100^\circ$ , is of considerable theoretical importance, as it shows that neither of the expressions  $(\mu - 1)/D$  nor  $(\mu^2 - 1)/D$  can be more than approximately constant. The observations of Rühlmann (*Ann. Phys. Chem.*, 133, 184), and of Damien (*Ann. l'école norm. sup.* [2], 10, 275) have shown that the index of refraction diminishes again when water is cooled below  $0^\circ$ . The author finds that the index of refraction attains its maximum value at a temperature of about  $-1.5^\circ$ . The author confirms Rühlmann's result that the curve representing the relation between the index of refraction and the temperature is not symmetrical on opposite sides of the maximum, resembling in this respect the similar curve for the density. The author also describes some experiments on the double refraction of ice, and has made some measurements, using the method of total reflection, of the two principal indices of refraction for different rays of the spectrum. He finds that a sheet of ice 3 or 4 mm. thick cut parallel to the surface of solidification behaves like a slice of quartz  $\frac{1}{2}$  mm. thick cut perpendicular to the axis.—*Journal of the Chemical Society*.

**LARGE PHOTOGRAPHS OF A GREAT JOB.**—The *Scientific American* says:—"We are indebted to Messrs. B. C. Miller and Sons, house movers, 979, Bergen Street, Brooklyn, for a set of three large and splendid photographic pictures, showing the moving of the great Brighton Hotel, at Coney Island, N.Y., in April last. In the *Scientific American* for April 14th we gave illustrations showing how the building was moved by means of railway cars and locomotives. One of the photograph pictures is 3 feet 9 inches long, and shows the locomotives and connected tackle arrangements in working order. The building was 460 feet long, 210 feet wide, and weighed 5,000 tons. The arrangement of the tracks and cars by which this great load was moved is clearly shown in the pictures, which have a peculiar value as original illustrations of a novel and remarkable undertaking."

**CUSTOMS DUTY IN THE UNITED STATES.**—From the *Journal of Chemical Industry* we learn that a special duty is to be levied on ferro-prussiate paper, it being no longer admitted as plain paper, the Customs minute being as follows:—"Certain paper in rolls, commercially known as 'ferro-prussiate paper,' which is intended to be specially used for solar photograph printing, is held to be dutiable at the rate of 15 per cent. *ad valorem*, as 'manufactures of paper,' under Schedule M. (P. I., 388), inasmuch as it appears that the paper proper, after manufacture, has been subjected to a further process by having one of its surfaces treated with a preparation composed of prussiate of potash and ammonia citrate of iron, which fits it for the special use above-mentioned."

**BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.**—The gathering of this year is now at Bath, and at the opening meeting on Wednesday evening Sir Frederick Bramwell, the new President, in his address, discoursed of the industrial results which are the indirect outcome of science. Sir Frederick appears, however, to be too thoroughly a commercialist—a trader on that which scientific men have done—to even faintly understand the motive towards real scientific work. Some matters of secondary interest to our readers are announced for certain sections of the Association.

**PHOTOGRAPHIC CLUB.**—The subject for discussion on Sept. 12th will be "Printing-out Process for Transparencies." Saturday outing at Hale End.

## To Correspondents.

\* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

**GEORGE RANSOME.**—1. Perhaps the best way will be to mould it with gutta-percha which has been softened by immersion in warm water, to render the service conducting by means of black lead, and then to deposit electrolyte copper on it. 2. Fine plaster of Paris will answer very well. Mix it to the consistency of cream, and when the plate is flooded, work through the plaster with a camel's hair brush, on the surface of the gelatine. If the plaster cast does not readily separate, pour water on the back and allow this to soak through. 3. You can obtain them from Winstone's Lithographic Material Stores, 100, Shoe Lane, London.

**F. GUTEKUNT.**—We have written to you.

**MATTHEW WHITING.**—Experience obtained by time can only answer the question, but we should hesitate to treat valued prints in this way—even with the half-saturated solution.

**W. MOUNTAIN.**—We quite agree with many of your sentiments regarding this matter, and shall deal with the subject in due course.

**T. B.—1.** It may used at once, if not abnormally cold. When very cold its solvent action on the silver chloride is reduced, and imperfect fixation often results. 2. Get the nearest oilman to mix you up some paint of the required tint and that will dry with a dull surface; a condition ensured by putting much turpentine and little oil into it. 3. Suitable materials are sold of the necessary width by dealers in photographic materials. Unbleached calico answers very well, but the widest obtainable at an ordinary draper's is a trifle under 6 ft. wide.

**G. W. II.—1.** Very nearly the same in all lenses constructed of suitable material—indeed, for all practical purposes you may consider the exposure identical. Still you must remember that some of the cheap foreign lenses are incorrectly marked. 2. A question of the intensity of the light, the sensitiveness of the plate, and the stop.

**C. L. BARBER.—1.** Your proposal is one that has often been made, and while quite recognising the desirability of doing something of the kind, we doubt the practicability of the scheme. 2. The commercial product answers quite satisfactorily, the ordinary impurities in no way interfering. 3. The Patent Office Library is at 5, Southampton Buildings, Chancery Lane, and is open each day from 10 to 10, with the exception of Sundays, Christmas Day, and Good Friday.

**E. OAKSHOTT.**—Next week.

**T. BOWMAN.**—Why not have ordinary carbon prints or platinotypes, as it will scarcely be worth your while to go to the expense of a photogravé intaglio plate?

**WATCHFUL.**—Write to the Secretary of the Photographic Society of Great Britain, at 5A, Pall Mall East.

## The Photographic News.

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# THE PHOTOGRAPHIC NEWS.

Vol. XXXII. No. 1567.—September 14, 1888.

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## CHOICE OF COLOUR FOR THE PHOTOGRAPHIC IMAGE.

WHAT colour shall be the most agreeable or suitable for the representation in monochrome of the coloured originals of nature, is a question which has for many years occupied the attention of artists and engravers, without producing anything like a universal consensus of opinion, and it need not, therefore, be a matter for surprise that a like diversity of taste should have arisen with regard to the tone of photographic prints. When, however, any particular colour is supported with decided assertions as being more artistic than that of other colours, it ought to be remembered that, even if any pretensions to artistic character as belonging to photographers or photographs be altogether ignored, there yet remains the fact first alluded to, that artists not in any way connected with photography have shown and do show predilections for different varieties of colour with which to reproduce their works. Pure black and white, with intermediate tones of grey, is the character which is commonly referred to as engraving-like, but modern etchings are often printed with ink of a colour between that of sepia and black, and the warmth of this colour is much admired, whilst many older productions may be found printed in sepia and terracotta colour. The works of Bartolozzi will serve as illustrations of an artistic taste for a colour far removed from black. To insist upon any particular tone for a monochrome image as being artistic does not, therefore, convey more than that the taste of the speaker or writer is in favour of those artistic productions which happen to be of the colour that pleases him. There has been a fashion in colour, varying with the time for the monochrome productions of the pencil and the graver, and there have also been fashions in the colour of photographic prints.

In a recent number of the *Wochenblatt*, Dr. Stolze has discussed this question, which has been brought into prominence by the increased employment of gelatino-bromide and platinum printing processes, and he expresses his views with so much clearness that we are induced to lay them before our readers, with the reservation that in a matter which is essentially one of taste, a complete uniformity of opinion is not to be expected.

Dr. Stolze sets out by observing that at the time of the introduction of photographs upon paper, there were strong differences of opinion as to the advantage or disadvantage of the particular colour in which they were then produced. Whilst many used the expression "photographic tone" as a reproach, there were not wanting those who stood forward with energy in support of the characteristic tone belonging to the new pictures, and praised it as being superior to the neutral cold copper-plate engraving tone. When photographers succeeded in obtaining beautiful warm tones in their productions, the public taste took to

them amazingly, and this liking went so far that when the collotype (lichtdruck) was introduced, it was necessary to employ ink which should represent the colour in which photographs were usually printed. There certainly appears to be now a reaction in the public taste. Large pictures especially are more and more produced in pure black or grey, and photography upon bromide of silver paper has had a large share in producing this change.

When it is desired, without consideration of the colours natural to the original, to translate it by simple light and dark, it stands to reason, says Dr. Stolze, that neutral grey should be chosen. Any deviation from this colour introduces a new element into the picture, and the question remains how far such a new element will be an improvement, or the reverse.

It is known that all the tones, from the deepest black to the clearest white in a picture, may be represented not only by grey, but by tones of any colour; thus, if in the carbon process carmine or Berlin blue be added in large quantity, the prints will be either red or blue, and in a process having extended application, the ferro-prussiate process, the pictures are altogether blue. No one will, on this account, question that from the aesthetic standpoint such pictures are repulsive, although the colours themselves are beautiful, and awaken more pleasing sensations than the meaningless grey tone of an engraving. But it is exactly in this circumstance that the secret of this unexpected effect lies. Each particular colour has its own particular character, and responds to certain sensations and circles of ideas. Red recalls to us a fiery sunset, blue a clear sky and a moonlight night, green a luxurious spring landscape, and these colours awaken corresponding feeling. A picture should therefore, at the least, not be printed in a colour in violent contradiction with the character of its subject, and as most pictures will contain subjects of various colours, any decided tint in the colour of the photograph will be at variance with the subject of some part of the picture. Thus, in a sunset landscape, the yellow lights and the grey shadows, the green tones on the leaves and the red of the sky, will be complementary of each other; in an open landscape, if a blue tone is used suitable for the sky, the green of the vegetation, and the brown and yellow ground, all appear dyed in pure blue. In a woodland scene, printed in a green tone, the unending variety of tender tints of leaves, the trunks of trees, even the sky and the red deer, are rendered by pure green. The whole thing is the summit of bad taste.

When it is seen that pure colours are so unsuitable for a monochromatic representation, the question arises how far a mixture of such colours, in what are called broken tints, will better fulfil our requirements. It is easy to see that this will be effected in proportion as the tone is removed from any pure colours and approaches grey.

There must be only a trace of characteristic colour left,



so little that the eye is filled with the neutral tint. But it almost always happens that this trace of colour necessitates a contradiction somewhere, and is not therefore so perfectly suitable as a pure neutral tint. A sunset picture may certainly be appropriately printed on rose-tinted paper, and toned of a very warm colour, whilst a moonlight picture would with such treatment almost entirely lose its character. If, on the other hand, this moonlight scene is printed on blue albumen paper, and toned as blue as possible, the landscape certainly comes well, but a fire burning in the foreground appears not as a fire, but as a Bengal light. A tone then of colour which is even, but slightly pronounced, does not give so harmonious a result as pure grey. It is the characteristic property of this last that it more easily translates various colours, because it corresponds in prismatic character to white light, which contains every colour.

Dr. Stolze having thus expressed himself in favour of grey as a colour most suitable for monochromatic reproduction, adds that his remarks particularly apply to large pictures, and proceeds to enquire whether the same considerations do not apply to small pictures, and if not, why there should be any difference. The conclusion he arrives at is, that as it has not hitherto been practicable to prepare paper by the methods giving pure grey tones, which shall keep the image on the surface as perfectly as the methods with albumen, and chloride of silver emulsion paper, it is better for the smaller sizes to contain for the present the use of the last named processes.

So far as strict truthfulness in the representation of the varied colours of natural objects by neutral tint, in preference to one of any decided colour, is concerned, Dr. Stolze appears to have the best of the argument; but it must not be forgotten that with most persons a certain amount of pleasure is excited by a tone or colour in the image which strikes the eye as being more agreeable than a pure neutral grey or black and white. When the amount of colour in the image is but small, the falsifying effect of such colour is inappreciable, and there will probably therefore be a continued demand for photographs of the tones which public taste has stamped with approval.

#### THE DETECTIVE CAMERA OF THE EASTMAN COMPANY: THE "KODAK."

Those who have followed the development of the detective camera from the first somewhat clumsy and not very serviceable models, will have noted gradual improvements as to the convenience and serviceability; but the instrument now before us is so distinct and considerable an advance on the detective camera already introduced, as to be worthy of very special notice.

The camera forms a black leather covered package with only the insignificant projections shown in the subjoined

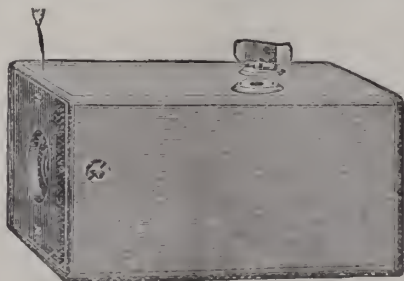


Fig. 1.

cut, and although the size is only  $3\frac{1}{4}$  inches by  $3\frac{1}{4}$  inches by  $6\frac{1}{2}$  inches, and the weight but 1 lb. 10 ounces, it contains within itself a roll-holder charged with one hundred exposures of stripping film for giving negatives  $2\frac{1}{2}$  inches in diameter. For carrying, a leather sling case is provided,

the whole not being larger or heavier than a good sized opera glass.

No finder is provided, this being rendered unnecessary by the fact that the roller slide apparatus adds only to the length of the instrument, not to the cross area, so that one can take easy aim; moreover, the lens supplied covers a rather wide angle—sixty degrees, in fact.

The "Kodak" is sent out charged for a hundred exposures, and, in all respects, in adjustment for immediate work, and is accompanied by a short manual with illustrated directions for use, which should make the successful working of the instrument easy even for a person totally uninitiated in photography—a war correspondent about to start, for example.

The "Kodak" is intended not only to be of use to the accomplished photographer who desires to have the means of making a maximum of exposures with a minimum of weight and bulk; but also to bring into the ranks a new class—those who do not wish to devote the time and attention which is necessary to really practise photography, but who desire to obtain records of a tour, or to obtain views for other purposes. Among the latter class will come many artists who, having noted the more characteristic points, will be glad to use the camera for recording details. To accommodate those not wishing to really become photographers, the Eastman Company have made arrangements for developing the exposed films.

Mainly to accommodate the new class of users, the Eastman Company have issued the Kodak Manual, a little book provided with fifty-two illustrations, and the most concise and clearest instructions for working; instructions mainly addressed to the novice merely wishing to expose, but supplemented by a section containing short instructions for development, this section being addressed mainly to those who already know something of photography.

The Eastman detective cameras contain, as said before, a roller slide, and this occupies about one-half of the case, and when the key shown at the top of the first figure is removed, the roller slide can be drawn out at the back, when it is seen as shown in the subjoined cut (fig. 2), and

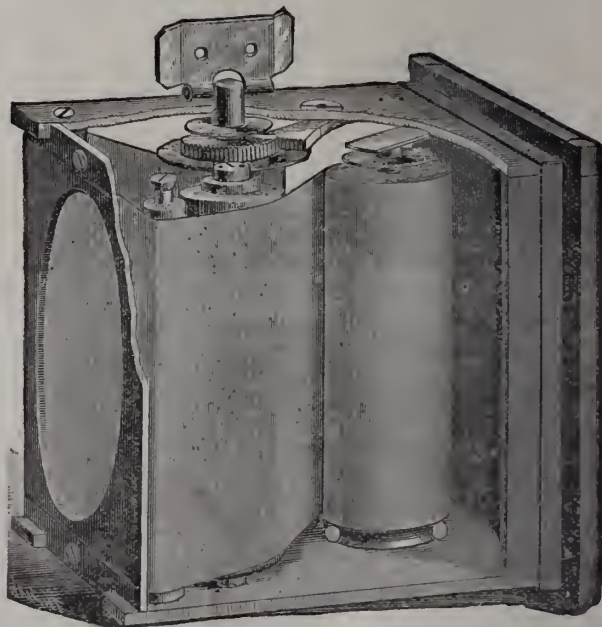


Fig. 2.

although at first sight the arrangement seems considerably different from the usual Eastman slide, it is practically identical as regards all essential features, but all parts are packed as closely as possible, and arranged so as to add



nothing to the width of the camera, only to its length; the arrangement of the rollers being shown in fig. 4.

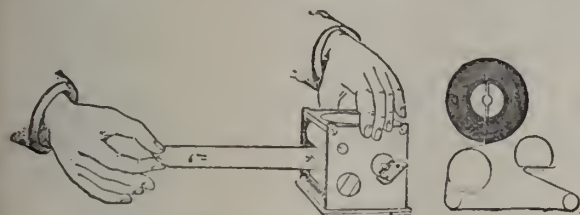


Fig. 3.

Fig. 4.

Fig. 3 shows the roller back taken out, and laid on its end for re-charging.

At the front end of the camera is a rectilinear doublet of a trifle under three inches focus, and the shutter is a horizontal revolving tube which envelopes the lens, and which tube is perforated on opposite sides, so that both holes pass simultaneously over the front and back of the lens. The shutter is actuated by a spring, this spring being wound up by drawing the cord shown at the top of fig. 1, and released by pushing the stud at the side. One winding of the spring serves for five revolutions of the shutter, each successive revolution being slower than the preceding one, so that by winding to the full, and then exposing, one gets the quickest exposure; while by winding to the full, and covering the opening while four runs of the shutter are made, and then exposing, one obtains the slowest exposure. When it is desired to rest the camera, and give a long exposure, as in the case of an interior, the camera is placed in position, and the shutter spring is run down by repeatedly pressing the stud, after which the shutter is turned to full open by the finger, and the exposure may be either terminated by covering the lens aperture with the felt plug which is provided, or by winding the shutter during the time of exposure, and pressing the stud when the time is up.

In order to protect the inexperienced user as much as possible against previous meddlers, each "Kodak" camera is sent out bound with a cord which runs through key and cap, and this cord is sealed. The Kodak Manual, already referred to as containing concise directions for the totally inexperienced, cautions them not to remove the seal till they have read and understood the instructions. Indeed, the person must be stupid indeed who cannot understand the simple directions given. We quote a few examples:—

*"Press the Button.*—To do this without swaying the camera to one side, grasp the Kodak as shown in the cut, with the left thumb on the button, and the ends of the



Fig. 5.

fingers around the corner of the box, giving a leverage whereby the button can be depressed by a muscular contraction of the hand, as in the cut above, not by pushing the whole hand against the camera."

*"Hold it Level.*—The Kodak must be held level. If the operator attempts to photograph a tall building, while

standing near it, by pointing the camera upward (thinking thereby to centre it) the result will be similar to this:



"This was pointed too high. This building should have been taken from the middle-storey window of the building opposite. The operator should hold it level, after withdrawing to a proper distance. See page 16 as to what the proper distance is."

"The operator stood behind the dog; he should have



been further to the left, so as to have taken a side view like that on page 19."

#### LIGHT FOR THE DEVELOPMENT OF ORTHOCHROMATIC PLATES.

THERE is but little difference of opinion as to the need for special precautions in illuminating the dark room when orthochromatic plates are to be developed, and what should be the nature of these precautions has been often discussed, the chief point of agreement being that "the best light of all is no light at all." It is possible to allow development to proceed in darkness, but to advocate such procedure is to advise a step backwards towards a mechanical production of photographs that is already too common. The development of the negative can scarcely be regarded as other than one of the most important operations that the photographer is called upon to perform, and one that needs a careful attention that cannot be bestowed in darkness if the best results are to be secured.

Looking at the question from a purely theoretical point of view, any change in the colour sensitiveness of a plate leads to a reciprocal change in the colour of the light for



its development that shall be the safest for a given standard of illuminating power. But it is not possible at the present time for the majority of operators, if for any of them, to work thus with theoretical exactness, because of the impossibility of getting pure—that is, unmixed—lights by the use of coloured screens, and of the limited number of tints that can be obtained in transparent or translucent sheets. Therefore, the dark-room lantern that is practically the best in one case may be the best also in other cases, because it is only an approximation, and may be equally near to the theoretical requirements of the various sensitive surfaces; or, although not equally good in the different cases, it may still be the best that is practically attainable.

If a plate could be prepared that should translate all colours according to their visual effects, the minimum of white light would probably be as good as any light for its development. But no such sensitiveness has yet been shown to be possible; the best of orthochromatic plates lacks in sensitiveness to some colours, and for the most perfect results a coloured screen is employed to stop a proportion of those colours that are too vigorous in their effect. If this screen is properly adjusted in its tint, it shows the colour to which the plate is deficient in sensitiveness, and therefore just the colour that would for a given illuminating effect produce the least photographic action; that is, a suitable colour for illuminating the dark room.

But here again the perfection of theory is scarcely possible in practice, and it can only be said that the colour of the screen may be taken as a guide to the general character of the colour of the medium advisable for use in the dark room lantern. Two or three points may be indicated in this connection.

Granting that the screen used in making the exposure is exactly of the desirable tint, it would doubtless be advisable to very considerably deepen the tint—that is, increase the intensity of the colour—before using it as a light screen for development. Several thicknesses of the same medium placed together would give such an increase of the colour intensity. The use of erythrosine in the preparation of plates is chiefly characterized by an increased sensitiveness to yellow and green, while to red there is little (if any) improvement. The yellow screen used with such plates has the special function of lowering the intensity of violet and blue light, and it matters nothing practically whether it stops red, or allows it to pass. But if a screen that stops red light were used for dark-room illumination, there would be by so much a loss of light that would, if present, add to the general illumination without adding to the risk of fogging the plate. And lastly, if any experimenter has a mind to try the use of a minimum of white light in the manipulation of orthochromatic plates in general, he would do well not to use subdued daylight (except, perhaps, on a foggy day), but gas or candle light, because the light from the sun is rich in ultra-violet rays which are photographically active though non-illuminating, and ordinary gas light is comparatively free from such rays.

In selecting a screen for the illumination of the dark-room in any case, it should be borne in mind that it may tend to the comfort of the operator if some safe light is excluded in order to get an agreeable tint. For instance, some operators may prefer a pure yellow to the yellow with the addition of red, and in such a case it might be well to exclude the red by using a yellow rather than an orange medium. A theoretical increase of light is too dearly bought if the operator finds it a trouble instead of an advantage.

### ORTHOCHROMATIC PHOTOGRAPHY.

BY CAPT. ABNEY, C.B., R.E., F.R.S.

IN my last communication on this subject—which is, alas! some months old—I endeavoured to show what would con-

stitute true orthochromatism, and ventured to predict that if photography remains what it is, it never will be accomplished. Let us now consider the kind of light with which we have to deal in photography. Daylight for our purposes may be divided into two classes, sunlight (direct and diffused) and skylight. Both of these may vary considerably, and we can only take an average quality of both. Now we may take spring time as supplying a good average quality of sunlight and skylight; the sky not being particularly dark blue, but rather milky. To complete the kinds of light employed, we may take gaslight as well. The following diagram will give an idea of the intensity of the

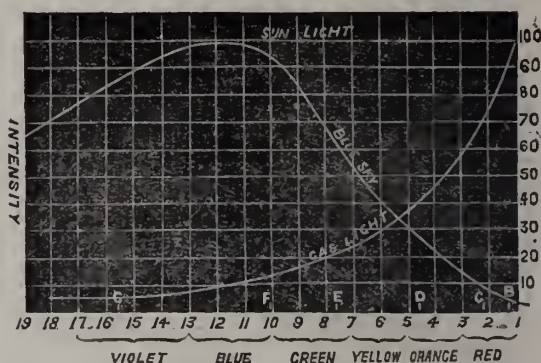


Fig. 3.

different rays existing in these two last compared with sunlight. The length of the diagram is the length of the prismatic spectrum, and beneath are written the various colours measured. For sunlight in this diagram the rays are taken to be of a value of 100, and the intensity of the rays of the other sources of light are taken in percentages of that of sunlight. Thus in the mean violet at 15 on the scale when sunlight is 100, skylight is 90, and gaslight is 6.5; or, again, in the green at 8 on the scale, if sunlight is 100, skylight is 70, and gaslight 20. Looking at the diagram as a whole, it will be noticed what a large preponderance sunlight has over skylight in red and yellow rays, and over gaslight in blue and violet rays. This at once tells us that for ordinary photographic plates the sun and skylight are vastly superior to gaslight as sources of illumination, a fact of course perfectly well known, but hardly up to the present demonstrated by quantitative measurement. The last diagram, however, gives no idea of the relative luminosities of the different spectra. This, however, is found in the next diagram. It

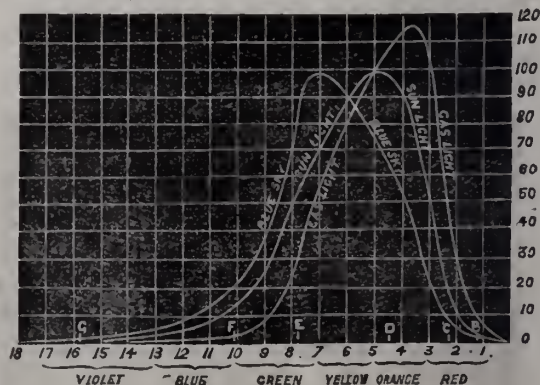


Fig. 4.

is intended to show the character of the light of each for equal illuminations. Thus, suppose we have a white object which appears equally luminous under the three kinds of light, it is interesting to form an idea as to what will be the luminosity of each ray reflected from it. Each of these curves has equal areas, which means



that each light *equally illuminates the object* in question, but that the hue of the lights will differ considerably. Thus, if we take it that sunlight illuminates the object with white light, the sky will be found to give a slightly greenish-blue tint to it, and gas light an orange yellow. It will also be seen that skylight, for equal illumination, has much more blue and violet in it than has sun light. A calculation from the figures on which this diagram was based shows that for equal illuminations the light which is ordinarily effective in photography has the following proportions in each :—

Skylight	Sunlight	Gaslight
20	10	1

Therefore, with an ordinary photographic plate for an object *equally illuminated* with these sources of light, the exposures would have to be in the above proportions to give similar results.

If we use orthochromatic plates without any extraneous absorbing medium, the results would deviate slightly. With some kinds of eosine dyed plates, to which we shall refer further on, the proportions would be about 20, 15, and 3. Looking at the last curve, however, if a plate were truly orthochromatic the exposures should be all equal, a result which is not obtainable at present, as before said.

Now let us see what would be the result if we placed yellow media in front of these. We will take two extreme examples, one erring (if anything) on the side of admitting too much green—viz., turmeric—and the other

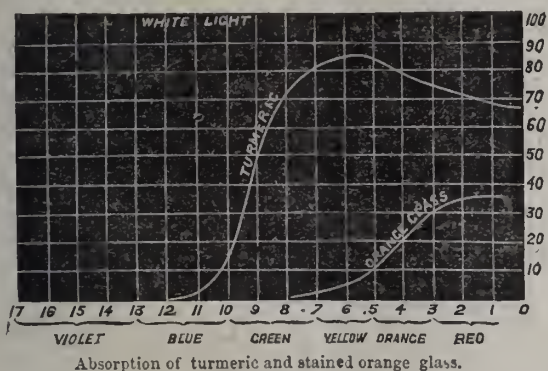


Fig. 5.

such as is ordinarily used—orange glass—which does not allow any of the blue rays to pass, and very few of the green. In these cases the curves of illumination will be very much modified.

Taking white light as 100, the curves below give the percentages of the different colours which permeate through the coloured media. The turmeric was used in the shape of collodion, and was prepared by making a saturated

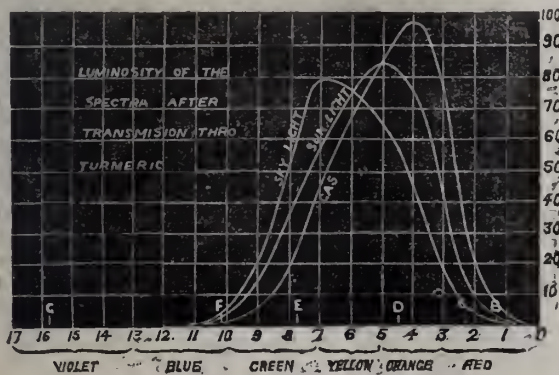


Fig. 6.

solution of turmeric in alcohol ('805), then adding to each  $\frac{1}{2}$  ounce, 5 grains of structureless pyroxyline, and then

$\frac{1}{2}$  ounce of ether. A thin glass plate was coated on both sides with this stained collodion. The kind of glass cannot as easily be described. It was "stained" with silver on one surface, and with copper on the other. One thing is apparent, viz., the vast superiority of turmeric in allowing light to pass over the orange glass.

Fig. 6 shows the luminosity of the spectra if gaslight, sunlight, and skylight, as seen through turmeric, the object being primarily illuminated with light from three sources of equal value to the eye, as in fig. 4. The area of each of the curves in fig. 4 is 520. The areas of the gaslight, skylight, and sunlight curves in Fig. 6 are 416, 395, and 358 respectively. Roughly speaking, four-fifths of the light penetrates through this medium, but this by no means represents the photographic value of the penetrating light unless a plate absolutely orthochromatic, as defined in our first articles, be employed. The values on ordinary orthochromatic plates we shall give later on.

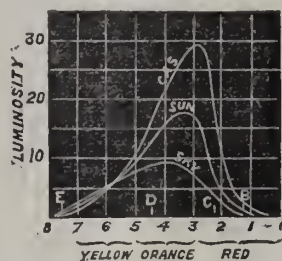


Fig. 7.

Fig. 7 shows the luminosity of the light coming through the orange glass under the same conditions, the areas of the curves which represent the luminosity of the unabsorbed white light being the same as before. The areas of the gaslight, sunlight, and skylight curves are 31, 56, and 33 respectively. Even of gaslight only about sixteen per cent. permeates, and of skylight only about 6 per cent. Thus, supposing a plate were equally sensitive to every ray, the exposure necessary to be given when the orange glass were used would have to be very much prolonged.

In some ordinary orange glass which is intermediate between the turmeric and stained orange glass, which is so often used, there is rather less green transmitted than with the turmeric, and a suspicion of ultra violet light also penetrates.

I have been thus particular in showing what is the real effect of passing white light through these media, as it is often imagined that any coloured medium in some way converts the whole of the incident light into the colour of the medium. It cannot be too forcibly impressed that the colour is due to the abstraction of certain of the spectrum colours from the white light, the residue representing the colour of the light transmitted.

(To be continued.)

## THE PRACTICE OF NEGATIVE RETOUCHING.

BY W. E. DEBENHAM.

### No. 1.—PROPER USE AND LIMITS OF RETOUCHING.

THE practice of working upon photographic negatives, called retouching, has now for many years been in almost universal employment amongst professional portrait photographers. This practice, however, has only too commonly been attended by such serious evils, that it is not to be wondered at that there should be those who have condemned it altogether. It will be well, therefore, before going into any detailed description of the methods to be employed in the execution of the work, to give some consideration to the question of the functions which retouching may properly fulfil, and of the limits which should be assigned to it.

In the first place, a legitimate use of retouching is to



remove defects which belong either to the photographic process itself, or to imperfect manipulation in the working of that process. The most obvious and striking defect of the photographic process is that of rendering objects of certain colours disproportionately light or dark in comparison with their appearance to the human eye. This is particularly the case with the colour yellow, which produces a very luminous effect upon our visual organs, and yet is, photographically, so inactive, that light of that colour is used for the purpose of the illumination of the dark rooms, where the sensitive plates are prepared and manipulated. Not only does the human skin reflect a notable amount of yellow and red—also a photographically inactive colour—but it is frequently covered in parts with patches or spots where yellow exists in considerably increased amount. The spots or patches are discernible to the eye, but even in daylight have commonly only a very slightly different luminous effect from that of the surrounding skin. By gaslight the difference is still less perceptible. When, however, such marks of yellowish coloration are reproduced by photography, they become so unnaturally evident as to produce a very unpleasant effect. To reduce such markings, whether they assume the form of freckles, of coloration round the eyes, or of a yellowish stain not unfrequently seen about the temples, to such an extent that they shall not be more strikingly evident in the photograph than they are in nature to the human eye, is an operation the legitimacy of which will not be questioned.

Another defect belonging to the photographic process, which it is the business of the retoucher to remedy, arises from want of perfect gradation. It is well known that after a certain amount of light has acted upon a plate, a further increase of light does not produce a correspondingly increased amount of action upon the sensitive film. The result of this defective action is that the highest lights in the photograph, when they lie upon lights that are themselves pretty strong, do not stand out with the crispness and relief that should belong to them. The strengthening of such lights up to the amount of brightness visibly belonging to them in nature is, therefore, another proper field for retouching. Unfortunately it happens that to do this successfully requires more artistic ability than is at all common, if we may judge from the manner in which the lights, say on the nose, or on the prominent parts of white lace, are depicted in so many of the published portraits to be seen in the shop windows.

The generally inadequate rendering of varying degrees of light at the other end of the scale—that is to say in the shadows—is another cause of defective representation by photography, the amelioration of which lies within the province of the retoucher. It must have struck many photographers that the shadows, for instance, on the flesh beside and partly round the eye, on the shadow side of the face, do not in nature approach for blackness the depth of colour of the pupil of the eye, or even of the line of shadow of the eye-lashes; yet in many photographs these shadows are rendered not many degrees lighter, and the line of eyelash near the nose on the shady side of the face comes but little (if any) darker than the flesh immediately surrounding it, in which therefore it is lost. We certainly do sometimes see bright, well-exposed photographs, in which the flesh even in the shadows has a beautiful luminous appearance, more in accordance with its natural effect on the human eye; but such photographs are not too common, and the retoucher's pencil may be well called in, in the majority of cases, to remedy the want of gradation in the shading of the photograph.

In the instances hitherto mentioned, the work of the retoucher will be admitted on all hands to be legitimate, as removing defects incidental to photography. That improvements in the photographic processes will render such after aid less necessary or desirable than at present, may well be believed. We now come, however, to work the legitimacy of which may be questioned by some, but the

necessity for which, in order to gratify the public taste and requirement, must be felt and provided for by professional photography. The office of that part of the retoucher's labour now referred to is the beautifying of the work, and the idealising of the subject. Towards the accomplishment of the first of these requirements the production of the effect of a fine stipple is found to be singularly efficacious. Why this should be so it may not be worth while to spend much time in discussing; perhaps it has something to do with it, that the effect of massing is thereby favoured; as details which might be obtrusive by interfering with broad general effects of light and shade are easily kept in subjection, if not altogether ignored. Stippling may, however, be used in the other direction, that of making the most of details to the detriment of the effect of massing. I have seen work mechanically beautiful in execution in which every small protuberance or indentation of the flesh has been rounded up, as though each had been the picture itself, showing much more prominently than in the original photograph; and the general effect of light and shade was thereby damaged, whilst the picture was distressingly hard and unreal. No manipulative skill can compensate for this style of work, which must be scrupulously guarded against, as being at the same time unreal, essentially inartistic, and displeasing.

It must be admitted that with the introduction of the practice of retouching, certain evils came into being in connection with the practice of photography itself. One such evil is, that a superficial smoothness, and what passes for prettiness, is sometimes spread over the pictures at the expense of resemblance, either to the sitter, or even to the ordinary characteristics of the human face. Another too common evil has been that the photographer is apt to depend upon the retoucher to make inferior work presentable, to give it a "finish," as the public call it, instead of relying upon excellence in the production of the camera. These evils are not necessary concomitants of retouching; in fact, the photographer who retouches his own negatives recognises that the time and trouble required in making presentable a bad negative is much more than that which would be taken up in fulfilling the conditions necessary for the production of a good one in the first instance.

The question of how far a photographic portrait may be idealised is an open one. Let us take a case of idealisation suggested by a sentence in the early part of this chapter. It was mentioned that yellowish stains and discolourations of the skin which show stronger in a photograph than in nature, would show less in gaslight than in daylight. They would show less still in a yellow light, such as a slightly tinted globe would transmit. Is it not permissible in a portrait to idealise to the extent of representing the subject with these discolourations no more evident than they would be in the most favourable light? Another duty which the retoucher frequently has to perform, is to remove or soften the frowning effect which the strong light of the photographer's studio so often induces with persons whose eyes are very sensitive. The light, which is so much stronger than that of an ordinary room, will cause a contraction of the brows, giving an expression very different from that seen on their faces under other circumstances. To remove or reduce this contraction so as to furnish a portrait more resembling that which is generally presented to the friends of the subject, cannot be considered an illegitimate idealization. The successful portrait painter, however, goes considerably beyond such idealisation as this. As to suppressing or toning down irregularities and blemishes in the skin, that is almost universally done by the portrait painter. Skillful retouching will effect this sort of idealisation of the portrait, and if the public require idealised portraits, it is not the professional photographer's business to refuse to supply their requirements, but, if he can, to meet them in some degree, if not to the same extent that is done by the painter. To show how this may be done in a way that shall be pleasing, artistic,



and as far as possible truthful, and to describe the details of the art of retouching in such a manner as shall make it attainable by any one possessing good sight, steady hand, industry, and some natural aptitude, will be the endeavour of the following chapters.

#### A CHAT WITH A "DOORSMAN"—A QUEER LESSON IN PHOTOGRAPHY.

It was at the East End that I met him. He was terribly shabby, he was unshaved, and his nose was red. He commenced the conversation while I was looking in the showcase, and marvelling at the wondrous works of art I saw therein, by remarking that I "was just in time if I'd like to have my photo taken, for the operator was disengaged, and the light was beautiful." He did not make these statements in a loud voice, but insinuated them as it were, in my ear.

I politely declined the invitation to enter, but went on talking to the doorsman, who, having nothing to do, was inclined to be communicative.

"How's business?"

"Well, it couldn't be wuss. What with the clubs on one side, and the amateurs on the other, we ain't got a chance. The doorsman's occupation's gone, as the Bard says. Excuse me a-quoting Shakespeare, but I was on the boards once myself."

"And how long ago was that?"

"A good many years, I can tell you. It was through a scene painter as I took up with photography. A deuced clever fellow he was; a little too clever for me."

I suggested that it was dry work talking. Would the doorsman venture to leave his post for five minutes and partake of a cheerful friendly glass?

"Lor, bless you, I might leave it altogether for any good as I'm get'ing out of it. If it wasn't for a little Sunday morning work I'd cut it."

"Well, sir, as I was saying," resumed the doorsman, taking up his gin cold, giving the glass a gentle circular motion, and staring at it as though his thoughts were assisted thereby, "I left the stage for photography. Business was very bad, there was nothing in the treasury, and the scene painter says to me: 'Timmins, old man, let's turn photographers; I'm told there's a pot of money to be made at it.'"

"That's all very well," I says, "but I know nothing about it. Do you?"

"Of course I do," he says confidently, "only you want a little capital to start with, to buy the apparatus, you know. If you can manage that the thing's done."

"Well the end of it was, he talked me into borrowing £10 of my mother, and we went to a place in Farringdon St., and bought all we wanted. My friend he'd spotted a place in a garrison town in Kent, and that's where we started. We'd got a tumble-down glass house in a yard at the back of a barber's shop, and paid 4s. a week rent. We spent a few shillings in paint, gave the place a couple of coats, and commenced business."

"Well, we did a roaring trade for the first fortnight. It was just the height of the glass positive days, and everybody wanted to be taken. My partner did all the operating, because I didn't know anything about it, and I stood at the door and touted for customers. But though the money kept coming in, I couldn't help thinking something was wrong, because I couldn't see any pictures."

"What do you mean?" I enquired.

"Why, though my partner sat the customers in the chair, and put his head under the focussing cloth, and all that, nothing came of it. Whenever a customer wanted to look at his picture, my partner always put him off with saying that it took quite a week before it could be got ready. Well, I thought that was all very well, but it did seem to me a bit strange he didn't show me, his partner, what he was doing, especially as I wanted to learn the thing myself. So, after we'd been going on for a fortnight,

and had taken ten or eleven pounds, I said to him, 'How are you getting on with the pictures, Joe? Can't I help you? Seems to me we shall be in a mess. For the last week I've been pestered to death by people coming after their portraits, and they've gone away very angry because they were not ready.'"

"Timmins," he said, "we *are* in a mess. It's worrying me awfully."

Then it flashed across me that he had been looking anxious. He hadn't talked much the last two or three days, and usually he was very chatty.

"Why, what's the matter?" says I.

"Well, this blessed photography isn't half so easy as I thought it was. The fact is, I've had nothing but awful failures."

"But didn't you tell me you knew all about it?"

"Yes, but I didn't really know anything. I thought I should pick it up directly, but somehow everything's gone wrong. Look here."

And he took me into the dark room we'd made out of brown paper and canvas, and showed me a heap of messy glasses; all he'd got to show for his fortnight's work. Of course, I knew now what he'd done, but I didn't then. He wasn't clear which he should use first—the developer or the cyanide. The bath was all queer, and he'd slopped collodion all over the place. Out of the box of glasses he'd only got two or three that had pictures on them, and they were like ghosts, and covered with spots.

Well, we sat down and looked at each other in despair. This was Saturday morning, and Sunday was our busiest day. But it wasn't the new customers we were afraid of; it was the old ones, who had paid their money and wanted something for it.

"If I only had a clear day to practise in, I believe it would all come right. I've studied this manual till I know it almost by heart. Would it be safe, do you think, not to open to-morrow?" he says.

"I'm sure it wouldn't," I says, decidedly. "You've promised no end of people that their pictures would be ready to-morrow, and if they come and find the place shut they'll think they've been swindled."

"I suppose they will. Well, I'll start afresh, and see whether by to-morrow I can't find out where I've been wrong."

"That's all very well," I returned, "but that won't help you with the people you've taken. They'll have to be done all over again, won't they?"

"I'm sure I don't know," says he, helplessly.

We talked no more just then, for some customers called about their pictures. How Joe explained matters I don't know, but they went away very disappointed. All that Saturday we had heaps of people we were supposed to have taken, and it seemed to me that each fresh person got angrier than his predecessor.

"It was an awfully weary day, and we turned into bed that night very miserable, dreading the Sunday morning. Well, Sir, when we went to the studio (because we didn't sleep there, you know), about nine o'clock, the barber met us, as black as thunder."

"Look here," he says, "I've let my place to you, but I'm not going to be annoyed! I've had a lot of people here kicking up an awful row, and swearing they've been done out of their money. Now I'm not going to stand that!"

"Joe had a very plausible manner, and he managed to pacify the barber somehow, and went into the studio; but no sooner had we entered than we heard a shouting and a hooting. It seems the thing had got wind that we were no good, and some of our angry customers (there were a good many soldiers among 'em, and they're rather hot tempered, you know) had been on the watch for us."

"Timmins," whispers Joe, "the game's up. We must bolt." And slamming to the door which led into the barber's shop, and turning the key, he snatched up the lens, got out of the window into the yard, and was over the wall like a shot, and I after him."



"Well, sir, we hadn't got clean away more than two minutes before the mob broke the door down, for we could hear a tremendous shout, followed by a smashing of the glass. We were afraid we should be chased; if so, it would have gone hard with us; but they were satisfied with wrecking the place, and let us alone."

"That was rather a queer lesson in photography," I remarked.

"You're right. I often think of it. Since then, I needn't say that I've learned much more. But photography's played out, and that's my opinion. Well, thank you sir, I will just have another drop."

And, leaving the "doorsman" to sip his gin and water at his leisure, I bade him good-day.

### Notes.

One outcome of the visit of the British Association for the Advancement of Science to Bath is the establishment of a local photographic society, and a full report of the first meeting will be found on page 591.

M. Karastojanoff, the photographer who was captured by Bulgarian brigands, has been relating his experiences, which will be found on page 587. The ransom was at first £5,000, but when he convinced them he was "only a photographer," they reduced it to £2,000, and finally to nothing at all. Karastojanoff remarks: "It is remarkable how these people are acquainted with everything that happens;" and we can quite believe the statement when we find that they returned him his photographic apparatus, but carefully destroyed the plates. It is very clear they are acquainted with photography, and did not want any tell-tale plate to betray them. Their final estimate of the value of a photographer at *nil* may be truthful, but it is not complimentary.

Photography was not discarded, after all, at the Beauty Show which opens to-day at Spa. The preliminary conditions involved sending in a photograph properly authenticated, and if this came anywhere near the standard of good looks in the opinion of the judges, the original was invited to attend. As the correspondent of the *Daily News* puts it, "This wily provision shows a knowledge of the sex, for such is the force of self-delusion on the score of good looks, that many persons of very ordinary exterior would probably journey from a distance under the idea that they were fairly entitled to compete." The same writer spots the weak point in regard to photography, by asking how the delicate question of age is to be decided upon, as it may happen that the candidate and her likeness do not correspond, and that some contriving photographer has so manipulated his negative as to strike off a decade. The result, we fear, will not be a testimony to the conscientiousness of photographers.

Chapman Jones's useful book, "Introduction to the Science and Practice of Photography," now comes to us nicely bound in cloth boards, the edition reviewed on p. 475 being in paper covers.

The collection of objects constituting the photographic section of the exhibition of the Cornwall Polytechnic

Society, now open at Falmouth, includes fairly representative examples of work by some of the leading professional photographers and some amateurs.

The evidence of experts in scientific cases is often of the most conflicting nature. To begin with, experts generally have a repugnance to making definite statements, and like to leave a loophole by which they can escape when pinned by a shrewd counsel. Too polite to contradict each other point blank, they qualify their evidence to such a degree that the result is obscurity. Professor Clarke, in an article in the *New York Popular Science Monthly*, says with much truth that "nearly every trial in which experts are called is harmful to the interests of science, for its supposed representatives too often forget their duty, and a feeling is spread abroad that all its conceptions are fanciful and uncertain." Professor Clarke's remedy is rather an elaborate one. He suggests that experts who care for practice in a court of law should be registered, or go through some form of admission to practice in such a way as to certify in a measure to their having received a proper scientific training; also that the Court should have the right to summon other experts, who, standing in a semi-judicial and non-partisan position, could listen to evidence and argument, weigh both, and aid the judges either in the preparation of their opinion, or in framing their charge to the jury. This plan seems open to objection on account of its complication. A simpler way would be to establish a court of scientific appeal untrammelled by questions of law.

The royalties are taking up photography very actively. We noted last week that the Crown Prince of Italy is reckoned one of the best photographers in the country. We may also add that the Duc of Oporto has been taking lessons in photography from Nadar, and intends to pursue the art with diligence when he returns to Portugal. Royal photographers, it is said, intend to figure largely at an exhibition of amateur work to be held at Vienna in October. Among those who have promised to send specimens of their work, are the Archduke Otto, Prince Miguel of Braganza, and many other princely and aristocratic exhibitors in Germany, England, and Italy. This is all very praiseworthy, but we hope that in order to test the abilities of these royal photographers, a prize will be offered for the best picture taken entirely by the princely competitor—that is to say, exposed, developed, and printed by him without assistance.

Artists as well as photographers have been complaining loudly of the quantity of the rain, and of the lack of sun. As a matter of fact, the weather has interfered terribly with out-door water colour work, and the effect will be seen in the winter exhibitions. Artists who have gone in the country prepared to do a year's work in a few months are in despair. Just now the weather is better, but the days are short, and the loss of June and July cannot be overtaken.

The *Metropolitan* has discovered a new photographic substance which it terms "cellularus," and further in-



forms its readers that it has received a specimen, which specimen is a portrait of a worthy alderman, "done extra cabinet size," whatever this may be. We are informed also that the portrait was a "photo in colours," and that "the scarlet gown came out wonderfully well." Altogether, the *Metropolitan* is very pleased with the "cellular system," so pleased indeed, that it would be a pity to explain to it anything about the Cellerier-Parkes process.

It is certainly a shock to one's feelings when the highly coloured picture of some popular favourite is found to be not a bit like the original, and that the artist, in the attempt to invest the drawing with "artistic merits," has drawn largely upon his imagination. We quite sympathise with a writer in the *Financial World* who, on meeting Lord Charles Beresford at a company meeting, was astonished to find that he was not a bit like the curly-haired sailor with whose lithograph the public are tolerably familiar. "It may be," says the writer, "that the cares of City life have thinned Lord Charles' hair on the top, and taken the wave out of it; anyway, we could not see the hero of the *Condor* in the business-like middle-aged gentleman who sat with his back to the light, and whose florid face was almost buried in shadow." To rebuke the too redundant fancy of the lithographic artist, we suppose, the *Financial World* gives a portrait of Lord Charles as he appeared to the *World's* artist, and we are bound to say that if the latter is correct, then the former has grossly imposed upon the public. We fear, however, that Lord Charles would favour the imposition.

But the different rendering of the same sitter by two artists is a very remarkable fact. It was noted a little time back in these pages, in the case of the various portraits of Dickens; and another instance is to be found in the twenty-eight pictures of Mary Queen of Scots, now on view in the Glasgow Exhibition. One critic has come to the conclusion that "mere differences in the style of dress, of doing the hair, of pose and of lighting, could not explain the extraordinary variation in the colour of the eyes and the form of the features, hence she is forced to the conclusion that the Queen did not actually sit for any of them." This is not by any means so certain. Any photographer is familiar with the experience of taking half-a-dozen portraits of the same person, one after the other, and with the same lighting, and yet not finding two alike. If the cameras can mark these differences, much more so the artist, especially when, in regard to colour, no two men see exactly alike.

The Paris Exhibition of 1889 is to be the field for the revival of a photographic project which promises to be of some importance. In 1886 the Photographic Association of Belgium conceived the idea of an international congress, and sent a programme of what they proposed to the various photographic societies, asking them to consider the question, and give their opinion upon the several points which the congress might discuss. Only a few societies—among them the French Photographic Society—responded to the appeal, and the promoters abandoned the project,

leaving it free to anybody who chose to take it up. It has occurred to the committee of the French Photographic Society that the Paris Exhibition offers an excellent opportunity for the assembling of such a congress, and, according to the request of the Society, the Minister of Commerce and of Industry has appointed a committee to organise the congress in question. The committee—the president of which is M. Janssen—comprises the names of all the best known photographers in France.

The series of articles on Negative Retouching, commenced this week, has the considerable advantage of being written by W. E. Debenham, one whose skill in retouching is accompanied by a full knowledge of the extent to which certain retouchers have brought photographic portraiture into degradation before the eyes of artists.

As we have pointed out over and over again, it is photography which has popularized portraiture, which has made the public demand the portrait of everyone who is distinguished by a notable action, whether good or bad; and our daily papers are constantly competing to supply the demand.

Of course the thing is easy enough in the case of a well-known individual, whose portrait can be engraved, and kept in reserve against the occasion when he will lay a foundation stone, make a great speech, or perform some public function; but for the *Star* of last Monday afternoon to contain the portrait of a man whose only claim to popularity was having been arrested in the forenoon on suspicion of having committed a murder, is a notable piece of journalistic smartness.

In the ordinary process of quickly making a block for a newspaper, photography plays no part, unless, indeed, the draftsman has a photograph to copy from. The sketch is made on lithographic transfer paper with the usual transfer ink, and then transferred by pressure to a plate of polished zinc, damped with gum water, and rolled up with printing ink, which adheres only to the lines, and this printing ink forms the resist to the dilute nitric acid which is used to dissolve away the bare metal, leaving the lines in relief. Full working details of the process, with all the precautions for strengthening the lines at each step, are contained in the *YEAR-BOOK OF PHOTOGRAPHY* for 1887.

## LAW FOR PHOTOGRAPHERS.

BY S. J. DEBENHAM (SOLICITOR).

### CHAPTER XI.—MISCELLANEOUS POINTS.

IN writing these papers, it has occurred to me that I might have treated at greater length various matters which engaged my attention, and I will now refer to one or two of them.

In an early chapter I dealt with the question of landlord and tenant, and noticed particularly the necessity for looking to the covenants of a lease before purchasing a goodwill or entering into a tenancy.

I enumerated the provisions of the Conveyancing Act 1881, with respect to leaseholders, and showed how a forfeiture might be incurred by breach of covenants by a



tenant, and the remedy for breaches available by a landlord, with the means of relief obtainable by a tenant.

I mentioned that the Act enables a tenant to obtain relief against forfeiture, except as regards a covenant not to assign, underlet, or part with the possession of the property, and cautioned my readers to be careful to observe this covenant. It appears to me, on reconsideration, not a vital point. Of course, it is right that any agreement between man and man should be kept, but the breach of such an agreement as this does not create a forfeiture.

It was decided in *Hyde v. Warden*, 3, L. R. Exchequer, that 'where a lease provides that the lessee shall not assign or underlet without the consent in writing of the lessor, which, however, is not to be withheld from any assignment, or underlease to a respectable and responsible person, it is unnecessary to the validity of an assignment or underlease to a person of that character that the consent of the lessor should be first obtained. And it seems that a power of re-entry upon the lessee wilfully neglecting to perform any covenant does not apply to a breach of a negative covenant, which this is.

For all this, people continually apply for and obtain the consent of the landlord to such an assignment or underletting, and in a case decided in 1885 (*Pierson v. Harvey*), Lord Coleridge, in giving judgment for the defendant (the action having been brought for a forfeiture alleged to have been created by such a breach), said that on the question of assigning without the lessor's consent there was no question on this point to go to the jury. The true meaning of the covenant in the lease by the plaintiff to the defendant against underletting was to prevent the landlord from having an underlessee who was not a responsible person thrust upon him, and to give the tenant the right to claim that consent for an assignment to any person who was responsible.

It appears from a correspondent that I have not made myself sufficiently clear about the relation of masters with servants and apprentices. I thought I had entered fully enough into the subject, but my correspondent, after stating, "We have a queer lot of fellows in the trade; and they have been known to scratch lenses with the diamond, they have fogged plates and paper to make it 'hot' for their successor, and during the last week they have taken bad negatives of sitters," asks the question: "In cases of dishonesty, drunkenness, &c., why should the employer give away a week's salary?"

Echo answers, "Why?" I find I stated a servant can be discharged for misconduct without notice. . . . It must be grave enough to justify such a proceeding, in case the servant should take legal action to recover damages. I did not enumerate drunkenness and dishonesty, but it is obvious that these are two flagrant instances of misconduct.

My correspondent adds: "In some of the large City warehouses, assistants have to sign an agreement, agreeing to instant dismissal for any cause (or no cause). Is that legally maintainable, or could it be set aside on the plea of undue influence, or as an impolitic practice for the law to recognise?"

I have before said it is my object to deal with every point, and am grateful to the gentleman for putting these questions.

1. There is no such thing as undue influence in a contract of this kind between one person and another. The only objection to a contract partaking at all of the character suggested, is that there was what is called duress. To establish this it must be proved that the contract was compelled by terror or violence.

Duress may consist either of actual violence, or a threat of resorting to it. Unlawful detention of the person, or imprisonment, or the enforcement of privation of food, may also be duress.

And even if a legal (by which I mean lawful) imprisonment be made the means of exacting a deed or other

document which is not the means of releasing the prisoner, it may be defeated on the ground of duress. But independent of the above, there must be actual fear of loss of life or limb, or imprisonment.

"Undue influence" is a phrase which is used as a cause for opposing probate of a will, and it is a pity people think they can avail themselves of it without due grounds. Unless a testator's mind is absolutely warped by undue influence, such litigation on such a ground is fruitless and hopeless.

To recognise such a defence would be to interfere with freedom of contract. If one man has the power of persuading another to agree to a given thing—no matter how hard or foolish—he can exercise that power with impunity. It may seem unfair, and no doubt many persons are induced to make bad bargains by others; but if the law were to interfere for their benefit, merely because it is a bad bargain, where should its intervention stop? It is part of the spirit of the age—the morality of political economy. Woe to the weakest!

2. My correspondent is referring, no doubt, to the doctrine respecting public policy, to which I have referred when dealing with restraint of trade. This would not, however, invalidate the contract. It cannot be said to be against public policy for two individuals to make such an agreement as that referred to. The same reason will apply here.

Therefore, the next question, could a clause be safely inserted giving the mutual right to master and servant of instantaneous dismissal? may be answered, *a fortiori*, in the affirmative.

I am asked also—What is the difference between articles of apprenticeship (indentures) and a merely stamped agreement? What is an indenture?

The main difference is that the former are under seal and constitute an indenture. The meaning of indenture is that the deed or instrument is indented or cut at the edges, and many readers have no doubt seen deeds indented, the top edge presenting the appearance of the teeth of a saw. But it need hardly be said that this is not necessary to give the document the nature and validity of a deed if it be under seal. It is related, indeed, that on an objection being taken by counsel, in old times, to a document, that it was not so indented, the Judge, to show his ridicule of the objection, took out his penknife, and forthwith indented it himself.

However, I am getting too chatty. The differences between a deed and an agreement are several. 1. A deed is in writing and under seal. 2. With some exceptions it is not necessary to show a consideration (*i.e.*, an inducing cause) for the former. 3. A deed imports the doctrine of "estoppel," *i.e.*, a man cannot dispute or deny what he has asserted by deed; he is estopped from so doing. There are other differences, but these are the principal.

There may be an agreement without writing, but there cannot be a deed without writing and delivery. "It is true that by the Statute of Frauds, certain agreements must be reduced into writing, and signed by the party to be charged thereon; and other more recent Acts of Parliament have rendered writing and signature indispensable to the validity of particular promises. But the ceremonies of writing and signature are in these cases prescribed, rather as necessary evidence of the contract or promise to which they refer, than as essential or ingredient parts of the engagement itself. In fact, the agreement is complete without them, and the mere circumstance of its being reduced into writing and signed does not alter either its character or its effect; but there are still wanting, and must be supplied, in order to give it efficacy, all the usual requisites of the simple contract. Thus the consideration is necessary to the validity of a simple contract, whether it be entered into it verbally or in writing."—(Chitty on Contracts.)

A sufficient consideration or recompense for making a motive or inducement to make the promise or agreement



upon which a person is charged or liable is of the very essence of a contract not under seal; and such a consideration must exist, although the contract be in writing. A gratuitous undertaking may form the subject of the moral obligation, but it does not create any legal responsibility. (This, however, is not the case in Scotland, where gratuitous contracts or obligations are effectual against the person signing them.)

A consideration may be sufficient, though not adequate, *i.e.*, sufficient in the eye of the law, though an outsider, or the parties, or one of them, may not consider it adequate, though if the folly of the contract be extremely gross, this circumstance may tend, if there be other facts in corroboration, to establish a case for relief on the ground of fraud. But as to the extent of trouble, loss, or obligation which one party has taken upon himself at the request of the other, it is immaterial that the burden thus assumed is of the most trifling description, provided it be not utterly worthless.

The above observations are sufficient, I trust, to explain the difference between deeds and agreements in general. As to apprenticeship deeds or indentures, I may add that there is a summary remedy to enforce them by summons before magistrates.

#### A PHOTOGRAPHER AMONG THE BRIGANDS.

In the *Daily News* M. Karastojanoff gives the following account of his adventures with the brigands:—

I was occupied in taking photographs of the beautiful scenery near the monastery of Rilo, with an assistant, when about four o'clock in the afternoon we suddenly met with about fourteen armed men. They pointed their guns at us, and two of them called out to us not to move or we should be shot. These two then came towards us, and we were bound fast. Then we were led up to the robber chief Elia, who said, "You don't want the Russians? You miserable wretches, we will soon drive out your love of the Coburger! He will get a rope about his neck as soon as you." The chief gave me several blows with the stock of his gun, and called me "Minister-President" in mockery. I told him he was mistaken in my personality; but he would not be persuaded that he had not M. Stambuloff in his hands, whom I somewhat resembled. We were then led through woods and over mountains, sometimes through villages, till near midnight, when our strength was quite exhausted. We stopped on the top of the hill which dominated the region. At dawn Elia gave me pen, ink, and paper, and dictated a letter to the Prince demanding £5,000 ransom for his "Minister-President." I told Elia that the sum was too large, but he assured me that the Coburger was enormously rich, and that £5,000 was nothing to him. When I again remonstrated, and swore that I was only a photographer, he reduced the sum to £2,000. There was no messenger at hand, so Elia allowed me to send my assistant away with the letter. No answer reached us, and I owe it to this circumstance and to the fact that other brigands arrived and confirmed my identity that I was able to lay down my ministerial portfolio in the hands of the robbers, and was for the future spared the beating at supper time, which till then I had suffered. The three brigands who had joined us must have been sent by another band, for a day later three others left our camp, taking a report with them. I believe that all the bands are in communication. On the sixth day of my captivity we crossed into Turkish dominions. Just before I had had a little adventure. We were camping among a grove of bushes, when suddenly the sentinel reported the approach of a strong patrol. The sentinels were at once withdrawn, and we all gathered together in the bushes. I was put in the middle, and two brigands stood over me with drawn daggers. They threatened to stab me the moment I should make the least noise. Naturally, I remained perfectly quiet. Soon after a strong patrol rode past us about thirty yards off, without an idea of our presence. An hour after we started again. One of the gendarmes of the patrol had been left behind. As he was going to pass us he was stopped, disarmed, and dragged with us. Two days later he took a fancy to brigandage, and in the afternoon pronounced his oath as a member of the band in the presence of Elia, after which ceremony a grand feast took place. During the night a patrol had been sent by the chief to the Turkish frontier station, Mehomia, and had brought plenty of victuals. Sardines, sausages, Swiss

cheese, preserved fish, wine and brandy, were plentifully spread out on the grass, and everyone ate and drank his fill. During the night we were terribly cold, but dared not light a fire, not so much to avoid drawing the attention of Turkish gendarmes, but because of the bears and wolves which Elia said were in the neighbourhood. With the exception of three Arnauts the band consisted wholly of Bulgarians. They were excellently armed. Each had a Berdan gun and about 100 cartridges. All had watches, rings, and large antique coins, and in their wide breeches they had a real arsenal of knives and daggers. The brigands are very pious. The fast of the previous week had been rigorously observed. One of the brigands called Petko put on at the beginning of the fast a splendid gold-embroidered priest's mantle, and read prayers out of a book. All the robbers stood up and listened reverently. They crossed themselves repeatedly, and when Petko had replaced the robe in its sack they still continued a pious conversation. I was curious as to where the priest's robe had come from, and asked Elia. He told me that the year before they had killed a Greek Archimandrite, and robbed the mantle from the sacristy of the church. The brigands almost always talked politics. The Czar and the Sultan are names that one hears constantly throughout the day. It is remarkable how these people are acquainted with everything that happens. Every evening patrols were sent into the villages and towns merely to gather the news. Last Thursday, just as day dawned, one such patrol came back to camp and gave Elia a secret message. That it was a pleasing one I gathered from the smile that appeared on the chief's face. But to this day I don't know what it was about. After break of day the chief called his band together, put me in the centre, and said that as they must go on and had no time to lose, and as no ransom had arrived, they must consult as to my life or death. On this three brigands led me aside, and remained with me, while the other eleven, with Elia at their head, formed a court-martial. They consulted for about six hours. I often trembled with apprehension, for I heard that one of the most influential brigands voted my death. At last Elia called us and pronounced the verdict, which was that nine against two voices decided that I should be liberated without ransom. The reason was then given, which was that after the brigands had convinced themselves that I was neither a minister nor an official, nor any other kind of blood-sucker, but a poor, decent man, they had no reason to keep me any longer. Then Elia said that if I had suffered any injustice from the brigands I should pardon them. Then the brigands embraced and kissed me one by one, and begged for keepsakes. Elia had taken possession of my gold watch as soon as I was taken; but he gave me back the chain, with the bunch of trinkets, as soon as I said it was a souvenir of my dead father. After destroying all the plates they also returned my photographic apparatus. It was already evening when Elia came to me and blindfolded me. I was to remain in the same spot so blindfolded for a quarter of an hour. When I took the handkerchief off, the brigands had disappeared among the trees, and I was quite alone. I set off home, and in the dead of night reached once more the Monastery of Rilo.

#### Patent Intelligence.

##### Applications for Letters Patent.

- 12,538. JAMES FREEMAN, Lewes Cottage, St. Mark's Road, Hantwell, London, W., for "Improvements in Flexible Photographic Negatives or Pictures, and in Apparatus connected therewith."—August 31st, 1888.
- 12,573. WILLIAM SCORER, 76, Chancery Lane, London, W.C., for "Improvements in the Construction of Photographic Cameras."—August 31, 1888.
- 12,915. THEODORE CASIMIR ROUSSEL, and ARTHUR SEYMOUR BULL, 191, Fleet Street, London, E.C., for "Improvements in and connected with operating Photographic Apparatus by Coin-liberated Mechanism."—September 6, 1888.

##### Specifications Published during the Week.

907. FREDERICK BARR, of 28, Clarendon Street, Walthamstow, in the County of Essex, an Electrician's Assistant, and THOMAS PARSONS WATSON, of 313, High Holborn, London, Optician, for "Improvement in Camera Stands."—Dated, 20th January, 1888.
- A camera-stand with sliding legs and a sort of ratchet and



pawl arrangement for retaining the sliding parts at certain definite points corresponding to the teeth of the ratchet.

The claims are:—

1st. In a tripod stand, the combination with two adjacent sliding sections, of the leg of a rack mounted on the one section, and a spring pawl on the other section, adapted to engage with each other, as and for the purpose specified, the pawl being provided with a projecting tail end or other means whereby it may be disengaged from the rack.

2nd. In a tripod stand, the combination with the three or more sliding sections of which each leg is constructed, of racks and spring pawls adapted to engage, as described, the pawl or pawls on all the sections, but one, being so situated, with respect to one of the adjacent sections, as to be automatically actuated thereby in the manner described, for the purpose of enabling the leg to be contracted by a single continuously sliding motion of the parts, as specified.

13,725. JAMES WILLIAM THOMAS CADETT, Photographic Chemist, Greville Works, Ashted, Surrey, for "New or Improved Means for Setting or Cooling Photographic Emulsions on Glass or other Suitable Materials used as a Support for Photographic Emulsions.—Dated October 10th, 1887.

The patentee says:—

The object of this invention is to readily and effectually cool and set photographic emulsions when placed on glass or other suitable surfaces by the active application of cold water in jets or streams either to the undersides of such surfaces, and to the bands or other carrying arrangements whereon such surfaces travel, or to both, whereby I ensure the proper cooling and setting of the emulsion or emulsions.

Hitherto such operation has been effected by the passive application of cold water to the bands, which have been caused to pass through a tank of cold water placed beneath the slab or table of a photographic emulsion setting table. The disadvantage of this method, however, is that the quantity of water taken up by the bands in passing through such tank is inadequate to sufficiently lubricate the bands and to chill the plates or other equivalent surfaces so as to ensure the proper cooling and setting of the emulsion thereon.

This disadvantage I effectually obviate by my invention, which consists in applying cold water to the underside of the plates or other surfaces which are coated with the emulsion, and to the bands or other carrying arrangements whereon such plates or surfaces travel, or to both the plates or other surfaces and the bands or other carrying arrangements through one or more perforated or slotted tubes or pipes, which are fitted to or in close proximity to the slab or table of the setting table in any convenient manner, and whereby the water is thrown on to such plates and bands or their equivalents in jets or streams of sufficient force and quantity to ensure perfect lubrication and the proper cooling and setting of the emulsion thereon. Or the slab or table itself may be perforated and have one or more tubes or jets fitted therein, through which the water can be delivered on to the bands and plates or their equivalents. Such tubes or jets are connected to the water main or to any other convenient and suitable water supply, so that a proper and ample supply can be obtained.

Preferably, the bands are made of any suitable porous fabric or material which will readily allow the water to pass through. If, however, the bands be made of a denser and consequently less porous material, I inject the water on to the band at a point where it passes over the roller so as to ensure its proper lubrication by bringing a sufficient quantity of water between the underside of the plates, or other equivalent surfaces, and the band. When the bands are made of a material that is impervious to water, I apply water to both sides of the band to ensure its proper lubrication.

In lieu of the perforated or slotted tubes or pipes above-mentioned, I may form suitable grooves or channels in the face of the slab or table over which the plates or other equivalent surfaces are moved, and fill or flood such grooves or channels with water which is conveyed thereto by means of pipes or tubes connected with any suitable water supply, so that the undersides of the plates or their equivalent surfaces and the bands whereon the same are carried come in contact with the cold water contained in such grooves or channels, thus chilling the plates or other equivalent surfaces. This modification of my invention is more particularly applicable where the plates or other equivalent surfaces are carried by cords or narrow bands or chains or edges, or are moved forward by hand.

Or I may use a grooved or channelled slab or table such as that

hereinbefore described in combination with one or more delivery tubes or pipes or nozzles as hereinbefore mentioned, so as to obtain a more copious supply of water, and thus flood both the bands and likewise the undersides of the plates or other equivalent surfaces, thereby securing increased lubrication of the bands, and a more speedy chilling of the plates or other equivalent surfaces.

The claims are:—

1. Delivering cold water in jets or streams on to the bands or other carrying arrangements of a photographic emulsion setting table and likewise on to the undersides of the plates or other equivalent surfaces when coated with photographic emulsion for the purpose of lubricating such bands or other carrying arrangements, and of chilling such plates or other equivalent surfaces, all substantially in the manner hereinbefore described and shown.

2. Employing one or more perforated or slotted delivery tubes or pipes fitted in any convenient manner to or around the slab or table of a photographic emulsion setting table, so as to deliver cold water in jets or streams thereon on to the bands or other carrying arrangements thereof, and also on to the undersides of the photographic plates or other equivalent surfaces, all substantially in the manner and for the purposes hereinbefore described and shown.

3. Fitting one or more delivery tubes or pipes or nozzles beneath the slab or table of a photographic emulsion setting table, so as to deliver the water in jets or streams on to the band or bands, or other carrying arrangements of the machine, all substantially in the manner hereinbefore described and shown.

4. Forming one or more grooves or channels in the slab or table of a photographic emulsion setting table, and fitting the same with delivery pipes or tubes for supplying water thereto, all substantially as hereinbefore described and shown.

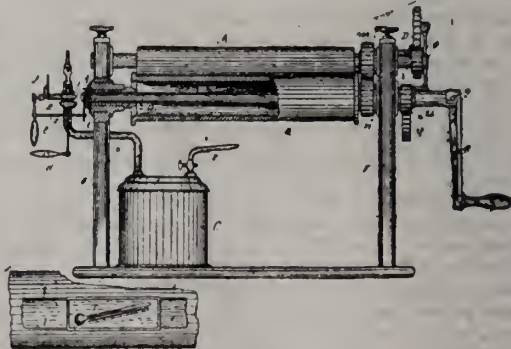
5. Forming one or more grooves or channels in the slab or plate of a photographic setting table, and fitting each such groove or channel with a perforated or slotted delivery tube or pipe, all substantially as hereinbefore described and shown.

6. The combination in a photographic emulsion setting table of one or more suitable delivery pipes or tubes, with a slab or table having suitable grooves or channels formed therein for flooding the bands or other carrying apparatus, and also the undersides of the photographic plates or other equivalent surfaces, so as to chill the same, all substantially in the manner and for the purposes hereinbefore described.

#### Patents Granted in America.

388,681. ALFRED H. HUMPHREY, Mendon, Mich., for "Photographic Burnishing-Machine."—Filed Jan. 30, 1888. Serial No. 262,357. (No model).

Claim.—1. The combination of the revoluble cylinders, gear-connected, one provided with a pinion, the other with a connected pinion and crank revoluble on its axle, a gear with which the crank-pinion meshes, a segmental gear meshing with one of the cylinder-pinions, and a connecting-rod between the segmental



gear and the gear which meshes with the crank-pinion, whereby the cylinders rotate first one way and then the other, while the crank is turned in one direction, substantially as set forth.

2. The combination of the gear-connected cylinders, one having a detachable pinion, the other having a connected crank and pinion rigidly attached to its axis by a set-screw, a gear meshing with the crank-pinion, a segmental gear meshing with the detachable pinion, and a connecting-rod between the segmental gear and the gear which meshes with the crank-pinion, substantially as set forth.

3. A gas or vapour burner for heating purposes, comprising



two concentric tubes, revoluble one in the other, and each provided with lines of perforations adapted to register with each other, in combination with the feed and burnishing cylinders, substantially as set forth.

4. A gas or vapour burner for heating purposes, comprising the concentric tubes, one of which is adapted to rotate, and each provided with the lines of perforations, and one having the slots in its said line of perforations, in combination with the feed and burnishing cylinders, substantially as set forth.

5. A gas or vapour burner comprising the concentric tubes adapted to be rotated one within the other, or *vice versa*, each having the lines of perforations, and the inner one having the slots, and provided with a lever, a stop to limit the play or throw of said lever, and a supporting-frame, all combined with the cylinders between which the photograph passes, substantially as set forth.

6. In combination, the revoluble hollow cylinders between which the photograph is to be passed, means for rotating said cylinders, the concentric tubes in the burnishing-cylinder, each having the line of perforations, and one revoluble in the other, and provided with a lever to rotate it, and a stop to limit the throw of said lever, substantially as set forth.

7. In combination, two revoluble hollow cylinders, means to rotate them, the concentric tubes having the spiral lines of perforations, the inner one provided with the slots in the line of its perforations, said tubes being in the burnishing-cylinder, and means to supply gas or vapour within the inner tube, substantially as set forth.

8. In combination, the revoluble hollow cylinders, the concentric tubes in the burnishing-cylinders having the spiral lines of perforations registering with each other, the inner tube revoluble in the latter, and provided with a lever to rotate it by, a vapour-generator, the handle of which operates the spindle to control the flow of vapour, having an arm adapted to contact with the lever of the inner tube, and the supporting standards or frame, substantially as set forth.

9. In combination, the hollow cylinders between which the photograph is passed, the tubes therein having the lines of perforations, one revoluble within the other, the revoluble one having a lever, a vapour-generator having an indicator denoting the throw of the lever which controls the flow of vapour, and an arm attached to said lever and adapted to contact the lever of the revoluble tube, substantially as set forth.

10. The combination of two hollow cylinders between which the photograph is passed, a tube in one of said cylinders having the line of perforations, and a gas or vapour apparatus for blowing the gas or vapour into said tube, substantially as set forth.

## Correspondence.

### PHOTOGRAPHIC GRIEVANCES IN CANADA.

DEAR SIR,—Mr Jos. J. Ackworth, in his letter in your issue of Aug. 7th, with remarks on our letter in your issue of Aug. 3rd, no doubt omitted to mention that during his travels through Canada and behind the scenes, as he terms it, represented the Britannia Works Company for the sale of the Ilford plates, and this may explain the deep interest he takes in the welfare of Canadian photographers.

In said letter he makes some assertions which we must take exception to, viz., that the Canadian brand and the United States brand of the Stanley plates are different. It is not so. They are one and the same, and identical in character, speed, and quality. And the speed of the Stanley plates has always been, and is, a strong point in their favour as compared with the Ilford; moreover, they give great satisfaction.

Mr Ackworth says, "As regards getting good negatives with the Canadian Stanley plates, that is easy enough—just as easy as it would be to get good negatives with the worst English plates in the market—and this consequently means nothing." As practical photographers we consider that good work is one of the best proofs of good plates. Few practical men, we think, would endorse the conclusion of Mr. Ackworth—that it would be easy to make good negatives with the worst English plates in the market.

Mr. Ackworth also over-estimates the duty payable on Ilford plates coming into Canada; he says 90 per cent. We make, according to the list prices, deducting 20 per cent. trade discount (this may be more or less, as we have no accurate information), the average duty on the three Ilford brands to be about 60 instead of 90 per cent.; or on their Ordinary, 73 per cent.; Rapid, 57 per cent.; Special Rapid, 47 per cent.—Yours truly, Wm. NOTMAN and SON.

Montreal, August 31st, 1888.

[In connection with the discussion on "Photographic Grievances in Canada," we may quote an article which appeared in the *Toronto Mail* of August 29th last.]—The announcement was recently made that the professional photographers of the United States contemplated the formation of associations similar to labour unions, and that one of the objects of the movement was to "freeze the amateurs out of the business." The prejudice which exists against amateur photographers in the minds of the profession is based altogether upon a misconception, and so far from amateurs being the enemies of the professionals, or injuring their business, the contrary is actually the case. In Great Britain and America there are thousands of amateur photographers who find recreation and artistic pleasure in the use of the camera. These disinterested votaries of the art are more enthusiastic in its pursuit than those who have to make a business of it. Many of them spend much time and money in experimenting in the field of photographic chemistry, and in several instances have made important discoveries which have greatly benefitted the profession. The amateur rarely meddles with portrait photography, which is the paying business of the professional, but confines his attention to landscape work, and generously distributes his products among his friends. But in order to qualify himself to take pictures, as distinguished from mere photographs, the amateur has to study the elementary principles of composition, of light and shade, and the laws of fitness and symmetry, balance and support. In order to give technical effect to his knowledge he must also study the methods of obtaining mechanical excellence, from the exposure of the sensitive plate to the making of the negative, and the final production of the finished print. Thus, the amateur becomes, so far as photography is concerned, not only an art critic, but a critic of technique. The amateur movement has consequently a decidedly beneficial effect upon photographic work; the skilful and artistic operator obtains a recognition of his merits, for the simple reason that the capability of judging is being extended among the general public, while the professional who turns out a low grade of work is discouraged. The increased attention paid to photography in consequence of the amateur movement has naturally led to an increased demand for the services of the professional, whose financial receipts have been correspondingly increased. The amateurs are really the best friends of the professional photographer, and to "freeze" them out, as is proposed, would be a very stupid proceeding. In England amateur photography has become quite fashionable, and several members of the Royal family and large numbers of the nobility have taken it up. In Canada there are amateur societies in all the principal cities, and the art is prosecuted with much enthusiasm, notwithstanding the discouraging effect of the oppressive tariff upon dry plates. Photography, in fact, has been found to be a fascinating amusement, and the camera to be a necessary part of the outfit of the tourist who has an eye for the beauties of natural scenery.

### THE PHOTOGRAPHIC EXHIBITION.

SIR,—Kindly permit me to remind intending exhibitors that Wednesday next, September 19th, is the last day for receiving "Packing Cases" from the country by our agent, Mr. Bourlet, 17, Nassau Street, Middlesex Hospital; and also that the same day is the only one for receiving pictures and apparatus at the Gallery, 5A, Pall Mall East, S.W. Any further information may be obtained from me.—Yours truly, EDWIN COCKING, Assistant Secretary.

## Proceedings of Societies.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The ordinary weekly meeting was held on the 6th inst., L. MEDLAND in the chair.

A gelatino-bromide plate had been brought down to the meet-



ing the previous week by S. G. B. Wollaston, after being in his friend's slide for a fortnight, and thereby likely to develop with green fog. This was taken away by W. Cobb, and during the week the plate had been divided and separately exposed and developed by himself and A. Cowan. The results were now shown. It appeared, however, that the intention of the two operators had not been identical. The aim of W. Cobb had been to produce a clear plate. This he had done by thoroughly washing and rubbing the surface of the film with his finger previous to development, and using a weak developer.

A. COWAN had used a normal developer—pyro and ammonia—the plate showing green fog. This was proved to be only on the surface, it being easily removed by rubbing.

W. COBB said on one occasion, in developing some negatives, using a normal developer, the plates showed a surface fog. He then took a couple of plates of the same batch, developing with an extra amount of ammonia. The result, much to his surprise, was a clear plate.

J. JACKSON exhibited one of the Eastman Dry Plate Co.'s detective cameras to hold films for one hundred exposures of  $2\frac{3}{4}$  in. square, the weight being thirty-five ounces. The lens worked  $\frac{f}{11}$  with a focus of  $2\frac{3}{4}$  inches, the aperture being  $\frac{3}{16}$  of an inch. A novel feature of the shutter is that after being set, six exposures in succession can be made. Prints from negatives taken with the camera were handed round.

The CHAIRMAN showed some photographs of Baldwin, the aeronaut—the ascent, getting ready to leave the balloon, and his descent with the parachute; the latter being taken with a detective camera.

J. NESBIT, in introducing the subject of stereoscopic photography, referred to the introduction of stripping films, by which the printing and mounting of stereoscopic pictures was rendered more simple. He was not in favour of the original size of the pictures being increased; he had recently seen some exhibited six inches in height; he believed this to be wrong in principle. A true stereoscopic effect could only be obtained by viewing the picture as a whole, and not in sections. The height should not be greater than its width, otherwise stereoscopes of a special size were required, causing great fatigue to the eyes. A half-plate camera was well adapted for stereo pictures. The practice of cutting a negative in two, and reversing the two parts for the purposes of printing, was not a good plan, as the ragged edges of the cut sides of the glass coming together showed in the print.

J. TRAILL TAYLOR considered the height of the stereoscopic picture immaterial. The eye could range in a vertical direction—an increase of size in some cases was even advisable. But he held to the old-fashioned size—the centres of the correspondent parts not exceeding three inches in distance apart. The plan of cutting the negative in two, and transposing the several parts for printing transparencies with one exposure by super-position, he considered very useful. It was largely adopted in America. He handed round several mounted prints to show that Mr. Nesbit's fears as to the ragged edges were groundless. The two parts of the negative, after being transposed, are laid on a sheet of plain glass, and bound round the margin. It is then ready for printing. Several views were shown by Mr. Taylor that were quite meaningless until the stereoscope was tilted upwards, when the effect was seen. In one or two cases this was caused by the trimming.

W. ENGLAND exhibited a large collection of stereographs, including many Daguerreotypes, which were viewed with much interest.

E. CLIFTON, remarking upon the difficulty of getting proper representations of geological specimens from drawings, said he had taken some binocular photographs for a friend of his—a geologist—which, when viewed in the stereoscope, gave impressions quite impossible for any drawing to convey. He believed stereoscopic photography could be brought into practical use in many other branches of research.

Replying to a question on single cameras, J. TRAILL TAYLOR said stereoscopic pictures of still life or scenes without motion could be taken with any camera; in fact, for objects of such a distance, requiring the points of observation to be considerably widened, the employment of a simple lens camera was absolutely necessary, or the sensation of solidity could not be produced in the picture; stereoscopic views of the moon, for instance, requiring a base line of some thousands of miles. To take stereoscopic pictures with a single lens camera, all that is necessary is to fix a base-board in the camera stand. Two strips of wood, acting as guides, are fastened one on each side of the base-

board, at such an angle that will permit of the camera, after an exposure, being shifted several inches, and a second negative taken of the same object, the axis of the lens and camera being still kept in the same direction. The guide pieces should be made movable, near and distant objects requiring a greater width of the base line of the parallax angle. Mr. Taylor said, by exercising a little effort, the act of viewing binocular pictures with stereoscopic effect, without an instrument, could be acquired; all that was necessary was a little practice, and a certain amount of control over the muscles of the eyes.

#### NORTH LONDON PHOTOGRAPHIC SOCIETY

An ordinary meeting was held at Myddelton Hall on Sept. 4, J. TRAILL TAYLOR in the chair.

B. J. Grover was elected a member of the Society.

Mr. Taverner presented a copy of Chapman Jones's new manual to the Society.

F. W. Cox exhibited a number of tastefully mounted platinumotype prints, the artistic qualities and technical excellence of which were fully appreciated. In answer to a question, Mr. Cox said they were produced by the original platinotype process.

Mr. Taverner showed a number of views taken on the occasion of the Society's visit to Waltham Abbey.

The following question from the box was then read:—"Can any member give the best method of mounting silver prints in optical contact with glass?"

Mr. BISHOP said that he believed there was only one method by which this could be successfully accomplished. An ordinary porcelain dish was filled with a solution of gelatine just strong enough to form a jelly when cold. This was warmed till it was quite fluid, and the mounting glass laid in the bottom; the print was then immersed face downwards, and the print and glass lifted out together; the excess of gelatine was removed with a squeegee, which also expelled any air-bubbles which might be present. After drying, the back could be varnished, and, if desired, a margin of black varnish put round the picture.

The PRESIDENT said that when this method of mounting was adopted it was necessary to use nearly colourless glass, as the ordinary sheet glass perceptibly degraded the high lights of the picture.

J. HUMPHRIES said that a glass used by microscopists, and known as "patent plate," was very suitable for the purpose.

The PRESIDENT said that "patent plate" was a term used to denote the method of finishing the glass, and did not in any way refer to the composition or colour.

F. W. HART said that most of the patent plate used by photographers had a distinct greenish tinge.

W. FEW said that a variety known as French patent plate was almost colourless.

Mr. COSSOR thought that glass in which a large quantity of lead was present was likely to change colour with time.

Mr. HART said that if the lead was properly combined it should not change. When the sand used for glass making contained iron, manganese was used to discharge the greenish or yellow colour; on exposure to light glass so treated would assume a pinkish tinge.

J. OAKLEY asked whether any members had any experience in the local reduction of negatives by rubbing with methylated spirit.

E. CLIFTON had used it and found it answer well; great care was necessary, however, as it was some time before the rubbing appeared to have any effect, but when the film was softened it was easy to rub it into holes. He preferred oxone bleach as a reducer, as it permitted a closer following of the lines of the picture.

The PRESIDENT said that it was a well-known fact that selenite films owed the various colours exhibited by them under polarised light to difference in thickness. Ornamental devices were now formed by fitting together, in a sort of mosaic, pieces of selenite of varying thickness. He thought it possible that a photographic image might be superimposed upon a single film of selenite which might be etched away so as to give the colour effect desired. He recommended the idea to photographers who were also microscopists.

Mr. COX said that he made a silver bath for sensitising plain salted paper. After a few pieces had been floated on it, it turned quite dark. He thought this might be caused by the dye from some tinted drawing-paper he had used, and wished to know how the bath could be decolourised.

The Rev. E. M. HEALY said that if it was shaken up with a



little kaolin, and allowed to settle, it would speedily become clear. This was the plan employed when sensitising albumen paper, when a much larger proportion of organic matter found its way into the silver solution.

Mr. HUMPHRIES asked if the new Jena glass was yet in commercial use.

The PRESIDENT said that Voigtlander, of Vienna, and Bausch and Lomb, of New York, were both using it for photographic lenses. Messrs. Swift and Co., of London, were also issuing lenses in which it was employed.

The Rev. E. M. HEALY showed a print from a negative which had accidentally received 200 times the proper exposure; although rather flat, all the details were plainly visible.

The PRESIDENT said that such a weak developer as must have been used would be useful when making negatives of street scenes where it was desired to omit representing the traffic. An acid developer could be employed with good effect in such a case, *i. e.*, when an inordinately long exposure had been given to an ordinary gelatine plate.

The subject on September 18th will be "The Mounting and Finishing of Photographs."

#### SHEFFIELD CAMERA CLUB.

A MEETING was held at the rooms of the Society, 8, Fitzalan Square, on Friday evening, the 7th inst., G. E. MALLIAM (Vice-president) in the chair.

The minutes of the previous meeting having been read and confirmed, Geo. W. Johnson was elected a member, and three other gentlemen were proposed for election.

A demonstration was then given by B. W. WINDER and J. O. ARNOLD in photographing by the magnesium light. Several very successful results were obtained by the ribbon and the flash-light in gun-cotton.

#### COVENTRY AND MIDLAND PHOTOGRAPHIC SOCIETY.

The usual monthly meeting was held at the Dispensary, Coventry, on September 5th, Vice-President AMBROSE in the chair.

The following gentlemen were elected members:—Messrs. Atkins, Harker, Lupton, Pocock, and Thomas, bringing the number of members to more than double what it was at the commencement of the season.

It was decided to hold a special meeting, on September 19th, to revise certain of the rules, and also for other business.

The meeting was informed of the progress made in the arrangements for the Exhibition. After some negatives and prints taken at the recent excursion had been shown round and discussed, the meeting terminated.

#### BATH PHOTOGRAPHIC SOCIETY.

ON Friday evening, the 7th instant, a meeting was held at 34, Gay Street, for the purpose of founding a Photographic Society for Bath.

PHILIP BRAHAM, F.C.S., said that the matter under discussion would be that of forming a society where they could discuss the various aspects of experimental photography at stated periods, and thus get a better idea of what they were doing than by any other means. It had therefore been thought that such a society would be of great advantage to amateurs and professional photographers. The President of the Photographic Society of Great Britain, a gentleman of world-wide fame, and excellent knowledge of scientific societies, was present, and he did not think they could do better than invite him to take the chair that evening.

FRIESE GREENE had known Mr. Glaisher's prestige in societies for years, and he was certain a better chairman they could not have.

This was carried by acclamation.

JAMES GLAISHER, F.R.S., &c., then took the chair, and in opening the business, said he was somewhat surprised when informed that there was no photographic society in Bath. The British Association, he said, is for the advancement of Science. It is therefore a good time for the founding of a society as a child of the Association, at this its second visit to Bath, and we should do all we possibly can for the furtherance of this object. From the time Fox Talbot took this picture now before me, and which I know very well, I have a vivid recollection of the scientific progress made in photography. I remember, when developing processes were tardy, and upon one occasion when I was so engaged, Sir John Herschel exclaiming, "There is the nose!"

In this picture of Fox Talbot's there is the same nose. In the great Exhibition, 1851, I saw many of Fox Talbot's pictures; and again, shortly afterwards, at an exhibition of photographs held at the House of the Society of Arts. At that time nearly all the photographers expected to be patted on the back, and as they did not get it, my address, which was in print, never appeared in the papers, as the photographers had stopped the account, but they could not stop another in a lecture I had then to give. I hope every gentleman present will come to see the Exhibition of the Photographic Society of Great Britain, to be opened at Pall Mall next month. We get a great number of appliances as well as pictures, and I have reason to believe that there will be as great advances as in the past. I should like to see this proposed Bath Society enter upon and do its work so thoroughly as to have a claim on the parent society. Is there one of us who is not anxious for progress? Strive to excel, and then you will be doing fairly towards this fair city to have a society. I would ask you to love our art, and help each other; let no bitter jealousies creep in; let A beat B if he can, but let it be done in a friendly way. The Chairman then related an anecdote in which Ross, Beck, and other opticians were pitted against the opticians of France and Germany in the production of the most perfect microscope. After a very close competition the honour fell upon the English microscope, a medal being awarded at the 1851 Exhibition to a class of instrument which left its rivals far behind. He hoped something of the same kindly feeling would be emulated in this new society. Do not enter upon a society lightly, said he; think that there is some work to be done. Go in for success; and success depends upon everyone feeling that as a band of brothers they will work together. Better not enter it at all than fail. To members of committee or council I would say: If you take office, be regular in your attendance at meetings. An absentee may ask to have the minutes of a meeting at which he was not present read, but he cannot understand the subject so well as if he had attended. If you do wish to accept office, never omit the meeting of committee. I do think a society would be for the good of the city. With these few remarks I should like to elicit opinions. If the men who have taken it in hand will think that they are not likely to put it aside to-morrow, but look well after the interests of the society, it will do well.

FRIESE GREENE was constantly meeting with amateurs who wished for information on development, and other matters of photographic interest, which a society here could easily furnish. The history of photography was much associated with Bath. Fox Talbot and Sir J. Herschell had done their early photographic work here, and a great many experimentalists had at different times resided here. He had often talked over the subject, but a bite was now given by Mr. Ashman having got this meeting together. He (Mr. Greene) knew of several who had received letters to be present, but they were unable to attend. When it became better known that a start had been made he was sure the movement would receive good support, and be an excellent thing for Bath.

P. BRAHAM remarked that one of the first points to consider was, should the society be exclusively amateur or mixed. He thought there should be no exclusiveness whatever. Either amateurs, professionals, or ladies should be admitted. There were many ladies in Bath who would like to practise photography, and who would assist materially in the success of the society, as they had already done in the Bath Microscopical Society, with a result that they had added much to the general knowledge of microscopy. If they could avoid ecclaisicism the society must prove an advantage.

AUSTIN KING, before offering an opinion, desired to know what form the society would take.

The CHAIRMAN could only say that the proposition was to admit all interested in the advancement of photography, and to frame it on as broad a basis as possible. Nearly every city and town had a photographic society, and he considered it advantageous to the parent society that this was the case. It gave them more work to do, and science was advanced.

G. F. POWELL had been an amateur photographer for twenty years, and now belonged to the "Bristol Society," which had lately embraced the title of "West of England." This society held outdoor meetings in the summer and indoor in the winter. He had many times thought it would be a good thing if a photographic society could be started for Bath. It had been said that a mixed society had not been found to succeed.

The CHAIRMAN: The broader you make the basis the better. Summer outdoor meetings are very enjoyable, and the results of



those who can go out often please those who cannot attend. There are some secrets in every trade and profession—in the optician's workshop, the photographer's, or anyone else's, and in my time I have been made acquainted with many a one, but directly I pass the threshold it is sacred with me. It ought always to be so. Professional and amateur photographer each have special advantages in different directions, and can, if they will, help each other. I will now ask you to express by vote whether you are in favour of a society being founded in Bath.

The decision was unanimous in the affirmative.

Then, said the CHAIRMAN, every society must be governed by rules. I would recommend that three gentlemen be appointed to draw up rules, and these be submitted to you for approval. What shall be the name of the society? Bath must be first: can we do as Mr. Powell inferred Bristol has done, assume so much and include "West of England" in the title? Upon the whole I think "The Bath Photographic Society" is as good as anything else you can select.

This title was agreed to. The amount of annual subscription was fixed at half-a-guinea. Messrs. Austin King, Philip Braham, and W. Middleton Ashman were elected unanimously a committee to prepare rules.

The CHAIRMAN expressed a hope that when he visited Bath again he should find the society prospering—that there would be no clique, for cliques were a curse to any society. He recollected when the Queen first became patron to the London Photographic Society. The Chief Baron Pollock was president, then money rolled into the coffers like water. The secretary at that time received a salary of £200 a year, and all went well for a time; but differences arose, and this flourishing society became involved in debt. The secretary pressed for his salary, and Messrs. Taylor and Francis served him (the Chairman) with a writ for £300. He was glad to say the money was paid, and the balance at the present moment was on the right side. He always welcomed ladies to their meetings, and when they paid to see the pictures hanging on the exhibition walls their money was as good as anyone else's. Do not confine your work, he said, to an exhibition of pictures, but have apparatus as well.

P. BRAHAM felt sure this inaugural meeting of the society appeared in a state to do something useful and scientific, owing to Mr. Glaisher having taken the chair. There was not another individual in England who could have given such advice and helped them so much in the same time. He concluded by proposing a very cordial vote of thanks to Mr. Glaisher for presiding.

AUSTIN KING, in seconding the vote, said it was unnecessary to say much on behalf of such a vote. Mr. Glaisher's great fame had spread throughout the length and breadth of the land. He was much charmed at the manner in which he had introduced the subject—important in itself as well as to mankind.

The vote was carried by acclamation.

The CHAIRMAN, in response, said it was the duty of the British Association to advance science wherever they had an opportunity, and in Bath, where there was so much intelligence, he hoped for a rich harvest. Those engaged in this work had his warmest wishes for success. Mr. King, he was quite certain, would work well. Mr. Braham he had met year after year at the Association gatherings, where he was always taking an active part; and Mr. Ashman was no longer ago than last year vigorously working on the new laws of the Society in London. He felt perfect confidence in these gentlemen doing their duty, and if there should be anything he could do for the Society they might at any time command him. Among the friends he met twenty-four years ago when the Association last visited Bath, Speke and Livingstone, now no more, had matters of great interest to bring before the scientific world. Soon after that session he (the Chairman) went seven miles high in a balloon for scientific observations. Up to the present there was nothing very startling about this session, but if the new Photographic Society proves to be a success, it would be a more pleasing thing to him than anything else which has transpired at this the second visit of the British Association to Bath.

## Talk in the Studio.

AN ABSOLUTE STANDARD SENSITOMETER.—From J. W. Newall we receive the following description of a sensitometer, for which he has a patent:—"A quarter-plate is taken and placed behind an opaque screen through which a series of figures from 1 to 50 are cut. At the beginning of the test all these figures are covered

by shutters. In connection with the shutters is a pendulum beating half-seconds, and between the two a train of wheels is arranged, by means of which, at each beat of the pendulum, one of the shutters is raised so as to expose one of the series of figures. In front of the instrument, at a fixed distance, is placed a standard light (the usual standard candle must be used till a better one is established). Now if the instrument be placed in a dark room, a plate inserted, the candle lit, and then the pendulum set in motion, it is clear, that by the time all the numbers are exposed, each of them will have been exposed for a gradually decreasing time to the action of a standard light, and the more sensitive the plate the lower the number, which will become visible on development. Instead, therefore, of any arbitrary valuations of the sensitiveness of plates, they can henceforward be called No. 1, 2, 3 or 50, meaning that the plate, when exposed in such a sensitometer as here described, will give a developed image when exposed for 1, 2, 3, or 50 half-seconds, as the case may be, and then developed with a standard developer."

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION CONVENTION NIGHT.—An exhibition of photographs and lantern transparencies of places visited during the Photographic Convention will be held at Masou's Hall Tavern, on Thursday, Oct. 4. Names of intending exhibitors should be sent to the Hon. Sec., J. J. Brigginsshaw, 128, Southwark Street, S.E., not later than the 29th inst.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The next monthly technical meeting will take place on Tuesday, Sept. 18, at 8 p.m.

PHOTOGRAPHIC CLUB.—The subject for discussion on Sept. 19 will be "Reproduction of Negatives." Saturday outing, Hale End; train from Liverpool Street, 2-32.

## To Correspondents.

\* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, Farnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, Farnival Street, London, E.C."

B. S. E.—Sift pumice powder through the finest lawn, and rub down with the tip of the finger.

C. N. J.—Thank you for sending: we have noted the fact.

R.—The apparatus you refer to is well suited for the work.

W. H. STANSFIELD.—They are generally made to order when required, and an engineer would have no difficulty in constructing them from the published drawings. Perhaps, however, it will be best to advertise for second-hand presses.

GEORGE H. ARTHURSON.—On exposure to air it absorbs water readily, and becomes liquid. Pour the fluid in a porcelain dish, and bake in an ordinary oven.

D. L. R.—1. The date was incorrectly stated in the minute made by the Secretary, but the error was corrected in the published report. 2. It is so purely a legal point that we can hardly advise. 3. Ordinary unbleached calico will answer the purpose very well.

H. CHARLES.—1. For this purpose common glue will answer better than the expensive sort of gelatine; but if it is acid, sufficient ammonia should be added to make it neutral or faintly alkaline.

THOS. BRANDENBURGER.—The address is that given in the Official Journal of the Patent Department.

J. S. T.—Occasionally to be obtained at a second-hand book stall—indeed, only a few weeks ago, we noticed a copy on a barrow standing in the Lower Marsh, Lambeth.

WM. MAINWARING.—The apparatus in question, though good value for the money, is too poorly made to be serviceable for regular use. 2. Possibly Murion & Co., of 22, Sho Square, can obtain it through their Paris agency.

CAMERA.—Rub lamp-black and starch-paste together in a mortar, and smear this on the woodwork with a sponge. A little bichromate of potash solution stirred in the last thing is useful, as serving to render the black coating less liable to damage from moisture.

W. COTTON.—Assuming that the photograph was taken with an aperture equivalent to  $f/8$ , we may confidently say that the lens is an excellent instrument.

W. BLAND.—There has been no new edition since the date you mention. 2. Write to the author, care of the publisher. 3. Customs duty would probably be charged. 4. Contamination of the toning bath with hyposulphite.

G. BLIES.—Apparently from some chemically active dust settling on them while wet.



# THE PHOTOGRAPHIC NEWS.

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### COPYING FROM DISCOLOURED SURFACES.

ONE of the most thankless tasks that falls to the lot of the photographer to undertake is the copying of a subject the ground of which has become yellowed or browned by age. Many will not venture upon such an undertaking at all, and of those who have done so there are not wanting penitents who regret their rashness, and give up the attempt in despair. Plate after plate is exposed—first, perhaps, with short exposure, in order to obtain some clearness in the blacks—then, the lights coming so very faint, a longer exposure is given to get some deposit approaching vigour; but only to find the blacks filled up, until at last the task is declared to be an impracticable one. And so it is under the ordinary conditions. Dr. Vogel, however, in the current number of the *Photographische Notizen*, points out what are the conditions necessary to success; conditions, the observance of which have enabled him to make a photographic reproduction of what will be recognised to be a subject of exceptional difficulty, *i.e.*, a manuscript on papyrus over 4,000 years old, now in an Egyptian museum in Germany. A description of the method employed will be of interest to photographers generally, as although subjects of such extreme difficulty do not occur in everyday practice, the plan adopted in order to secure printable negatives from such trying subjects is applicable to the comparatively moderately difficult undertakings that do frequently occur. Dr. Vogel describes the papyrus and the method adopted in copying thus:—

The coarse fibred papyrus, which showed fibres both lengthwise and crosswise, was of a deep yellowish brown colour, and bore distinct traces of a crumbling action. On the papyrus was black writing, fables, painted in hieroglyphic characters. The beginning of the chapter was written in red. A part of the papyrus has been attached to glass with paste, in order to keep it together; traces of the paste showed themselves as whitish patches upon the letters.

In order to make the contents of the papyrus accessible to other scholars, and to preserve the writing before the whole became further decayed, it was decided to have it photographed. The execution of this work was entrusted to an establishment of the highest rank—one, too, in which orthochromatic photography is a speciality. The result was unsatisfactory; writing which was easily legible in the original came out so interrupted by light and dark streaks as to be completely unreadable. The establishment refused to make a second attempt. The costly work had been executed in vain. The papyrus was then sent to Dr. Vogel, in order that he might see if he could secure a better copy.

It was evident that the work could only be executed with orthochromatic plates, as with ordinary plates the brown ground acted no more strongly than the black letters.

Eosine plates by Perutz were employed. The first exposure certainly gave the ground light and the letters dark, but, unfortunately, the negative showed light and dark streaks, as in the reproduction that had been made by the establishment before mentioned. The cause of the black streaks was recognised at once. They were shadows thrown by the fibres, and disappeared as soon as the original was evenly lighted from both sides. The cause of the white streaks was discovered whilst examining the image on the ground glass, with the head well covered by the focussing cloth. It was then seen that the separate fibres of the papyrus glistened on the light side with a peculiar bluish light.

The first exposure had been made with eosin-silver, without a yellow screen. In landscape work the yellow screen is not employed, but in reproductions its use is often necessary, in order to subdue the powerful light effect of the blue. In this particular case it had not been thought necessary to use a coloured screen, since there was no blue in the original to be copied. When, however, the bluish reflection was observed, it was decided to employ a screen coloured with aurantia. The exposure made with the help of this screen (behind the lens) resulted in a complete success.

The black letters, as well as the red ones, now stood out with absolute clearness on the ground of the papyrus. There was no longer any trace of light or dark streaks to spoil the copy. The letters appeared, as Professor Erman, the Director of the Egyptian Museum observed, more legible than in the original.

The eosin-silver plates showed their characteristic defect of not rendering the red, in virtue of which the red letters came out as dark as the black ones. With azulin in this case the red letters would probably have come too light. The time of exposure with yellow screen was double that which had been given without it (fifty seconds, with Steinheil aplanatic stop, No. 4, copy same size as original).

As some of the negatives printed too thin, it was decided to use the uranium intensifier, and the formula chosen was one supplied by Dr. Vogel's son, and runs thus:—

Ferricyanide of potassium (solution,	
1 in 100) .....	50 ccm.
Nitrate of uranium (solution, 1 in 100) .....	50 ccm.
Glacial acetic acid .....	10 to 12 ccm.

This intensifier acts very vigorously for reproductions. The negative (well washed, of course), either wet or dry, is immersed in the solution, and, according to the length of time during which it remains there, acquires a more or less deep brown deposit, which affects the printing in an extraordinary degree. With many negatives a light brown is sufficient. If the negative has been too strongly intensified, it may be easily reduced by long washing (ordinarily the intensified negative is washed after the



use of the uranium bath for from ten to fifteen minutes), or by the application of dilute ammonia, which destroys the brown colour. If it is desired to render portions of the negative less intense, this can be accomplished by the application of dilute ammonia with a brush.

In like manner, the too powerful lights in intensified instantaneous pictures may be very successfully reduced. On the other hand, by the help of a brush the uranium solution may be led over certain parts of a negative, and these parts thereby strengthened. This method was employed in the case of the papyrus negatives to those places where the original showed patches of a darker brown, and which in the negative, therefore, came weaker.

By the method described, even and clear copies were successfully produced, in spite of the uneven and difficult character of the originals operated upon.

## THE PRACTICE OF NEGATIVE RETOUCHING.

BY W. E. DEBENHAM.

### No. 2.—THE DESK.

For many years before the practice of systematically retouching negatives came in, it was an occasional habit with photographers to touch out any bad spot on a negative by holding the plate up to a window, and applying colour with a brush to the transparent place. Sometimes rather more was attempted than the mere filling up of defects due to manipulation. Wrinkles would be covered with a thin coating of colour, and freckles treated in a similar way. A primitive sort of retouching was thus performed, but under great disadvantages.

The inconvenience of the position, the awkwardness of having to hold the plate with one hand all the time it was being worked upon, and the confusion arising from such a large surface of light being presented to the eye, and from some light being reflected from the unsheltered surface of the plate, were obstacles in the way of executing anything like the complete systematic retouching that was subsequently introduced. A desk or easel was therefore made use of, consisting of a slope fitted with frames to receive the negatives, and supplied with a reflector lying flat upon the table or base-board of the desk. This form of desk, however, has the serious disadvantage of necessitating a more or less stooping position, as although the negative may be on a slant, the eyes must look downwards towards the reflector, which is flat on the table. Having observed many years since that a retoucher who had been working for a year or two at a desk of this kind was acquiring a stoop, it occurred to the writer that the position which induced the stoop might be obviated by an arrangement of the desk which should make the line of sight nearly horizontal,

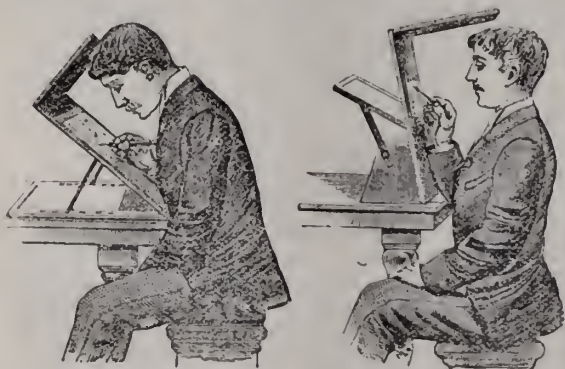
get rid of the stoop which had been acquired at the older form, but to develop an upright figure and healthy carriage in another who began the work at that time, and who previously had a somewhat stooping gait. The advantage to the health of the more upright position as a habit, to say nothing of graceful bearing acquired, will be readily appreciated.

The leading feature of this second form of desk is the raising of the reflector to nearly the level of the eye. This change involved that unless the reflector was unusually large, the negative, if a large one, could no longer be illuminated all over at one time, but only on that portion which is above the level of the bottom of the reflector. As, however, it is generally desirable to shut out the light from all but the part upon which we are working, there is no disadvantage, except for larger heads than are generally photographed, in the aperture for light being comparatively small, and all above the level of the bottom of the reflector. Starting, then, from this level, there is in the steeply slanting board an opening three inches broad by four inches high. An adjustable lath serves to rest the negative upon; through the ends of this lath two screws, which work up and down in slots cut in the slanting board, and are fixed by milled head-nuts at such height as to bring the face on the negative opposite the middle of the opening. The reflector is hinged or pivoted, and set at such a slope as is required, in order to present a clear surface of sky to the eyes of the retoucher looking through the negative.

A second lath, thinner, and about two inches in width, may be placed above the one which serves to support the negative. This extra lath is to serve as a rest for the fingers, to keep them from contact with the surface of the negative. As it has to go over the negative, it must stand about an eighth of an inch above the surface of the slanting board. This is conveniently managed by placing washers of that thickness on the binding screws which pass through the ends of the lath, and the slots already referred to, as serving to adjust the height of the supporting lath.

At the back of the board, just outside the edges of the 4 by 3 opening already mentioned, are grooves to carry a piece of ground glass. This glass must be removable, as occasions arise when it is better dispensed with. The grinding of the glass must be exceedingly fine—the same as is employed for the focussing screen of the camera. This sort of glass is known as the “finest matted.” It must be kept clean; a speck of dust even is sufficient to interfere with the work, although the glass is by position not in immediate contact with the negative. Some retouchers prefer to use, in place of the reflector, a sheet of clean white card or paper. This will do in a strong light, and with a thin negative; but, under the contrary conditions, does not reflect sufficient light to penetrate the denser portions of the plate. There are thus three gradations of light that may be employed according to the intensity of the negative and the strength of light; the card or paper reflector giving the least penetrating illumination, the glass mirror and ground glass the medium amount, and the mirror without ground glass when it is desired to use all available light. The mirror should, particularly in the last-mentioned case, be so adjusted that on looking through the negative with either eye alternately without moving the head, there shall be no sash-bar, chimney, or other object in the line of sight—nothing but clear, unobstructed sky.

To prevent confusion arising from light reflected from the surface of the negative, there should be no mirror or very light object behind the retoucher, and to further concentrate the attention there should be side screens, not shown in the woodcut of desk, reaching from the top board to half-way or more down the side of the slanting board. These side screens may be of wood, made with the desk; or if it is unfurnished with them, a cloth thrown over the top, and hanging down on either side



No. 1.—Original form of desk.

No. 2.—Steep slope desk.

instead of being vertical, as when looking down on to a reflector. The manner in which this idea was carried out will be described presently, but it may be said here that the effect of using the more upright desk was not only to



like a focussing cloth, will suffice. Still further to shut out extraneous light, a piece of black card or paper, having an opening rather larger than the head to be retouched, is laid upon or under the negative.

As the slant of the desk is so nearly upright, there is a tendency to push it away by resting the hand on it, which tendency must be overcome. One way of doing this is to place a heavy weight on the base board (the board upon which the sides stand). Another, better plan when a work table is given up for the purpose, is to use a screw with milled headed nut, the screw passing through a hole in the table, and a slot in the base-board. The slot permits of the desk being fixed nearer to or further from the edge of the table, as may be more convenient. Yet another method is that shown in the woodcut, where two brass bands bent down into the form of a knuckle are attached to the bottom of the desk, and stop against the front of the table.

It is important that the desk should be so firmly fixed as not to shake and tremble with the pressure of the retoucher's hand. A twittering movement is very distressing, and if continued, injurious to the sight. If the table be small and light it is well to place it firmly against the window, and let it stand so that it shall touch the solid wall. A further addition that may be made to the desk is the fixing to it of a magnifying glass. This is not required by those whose sight is powerful, and if the desk is not very firm and solid, the pressure of the hand may make the glass tremble, which trembling is again very distressing and injurious. In this case it is better to have the magnifier mounted on a stand like a condenser of a microscope, but of course on a larger scale—large enough, in fact, to bring the magnifier into proper position when the stand is placed on the work-table. When the use of the magnifier is only occasional, it may be held in the left hand.

Retouching desks of this second form, which it is strongly recommended to employ for the health considerations that have been referred to, are now to be obtained commercially under various names, the distinguishing feature by which they may be recognised being the position of the mirror, which is raised and sloped instead of lying flat on the table. The slope on which the negative is laid is also much steeper than in the old form. They may also be very inexpensively made from the description given.

There is no necessity to make the desk folding with an adjustable slope; indeed, fixed wooden upright supports screwed to the sloping board and to the baseboard are to be preferred as more solid and steady.

If it is required to retouch heads larger than the size of opening, 4 by 3 inches, a special desk must be made, as it is very undesirable to work at patches only of a face without being able to see the whole of it at once. Heads of larger size than that mentioned are not common in photography, but may be provided for by having a larger opening fitted with a plate of speckless glass, upon which the smaller negative plates may be laid when all-sized work is to be done on one desk. White card instead of a mirror will generally be preferable for these large heads, which commonly are not of such intensity as absolutely to require a glass reflector.

## AMATEUR v. PROFESSIONAL.

BY C. BRANGWIN BARNES.

AMATEUR photographers being now much more numerous than ever, it behoves the professional follower of "the art science" to look about him and consider the matter in all its bearings and from all points of view, so as to come to some decision as to what influence, if any, the present rage for amateur photography has had so far, is having at the present time, or is likely to have in the future, upon that same art science in an artistic, scientific, and last, but not least, in a financial sense. Now that men and women of all classes and of all ages are becoming students of pho-

tography, both as applied to landscape, architectural, and portrait work, is the rush of amateurs having any effect upon professionals, and, if so, in what way is that effect showing itself? Has it incited them to further efforts to improve the artistic and general quality of their work, or has it necessitated renewed efforts on their part to maintain their business prosperity?

So far as the art side of the question is concerned, there is little or no doubt at all that many amateurs, who really have a love for the work, can and often do produce results equalling, if not excelling, those obtained by some professionals; but, while the number of amateur photographers, in the present year of grace 1888, is legion, the names of the really successful ones would make a very small list indeed. Any lad who purchases a guinea set of apparatus and proceeds to make negatives, calls himself an amateur, and, I presume, he has a perfect right so to do. We have lately heard that a royal aspirant to photographic fame has in one instance succeeded in excelling professional portraitists by obtaining a thoroughly good and pleasing portrait of a very difficult subject; but we have not yet heard all the truth about the matter, as to how many failures were registered before the one successful negative was obtained; nor have we, as yet, any intimation to hand as to the time the royal model, or subject, gave to the royal operator as compared to that she gave to the professionals who had, one and all heretofore, signally failed to give satisfaction. Neither do we hear anything as to whom the retouching was given, or whether the operator was in this case also the printer and finisher. Granted, as may be the case, that the royal amateur not only exposed the negative, but personally carried it through all the subsequent processes, the fact remains that the sitter was a relative of his own, and we all know that professional photographers can usually obtain good results of their own family; in fact, it is often stated that photographers make better specimens for the show case by taking their own children than they could otherwise obtain. Whether this be true or not is, however, very little to the point, and as the successful portrait is being published, we shall, on seeing it, be better able to judge for ourselves as to the ability of the operator, and I shall personally be very pleased if the portrait turns out to be as good as it has been represented. If we are to have amateurs—and why should we not?—let them have their due share of praise when they deserve it. Far be it from me to cast a slur upon the genuine amateur, for whether he injures the professional or not, so far as his pocket is concerned, he must in the long run help him in an artistic sense. The competition of the amateur whose heart is in his work is the very best thing that ever could happen to the professional photographer. "Competition," it has been said, "is the life and soul of business," and if of business, so of art and science. If the amateur photographer obtains results equalling, or surpassing, those obtained by the professional, then it must wake the latter up and incite him to fresh efforts. The amateur, too, has often money and time at his back, that the professional lacks; time in which to conduct his experiments in the different branches of the art; and money wherewith to pay for those experiments. The results at which he arrives, and to arrive at which he has spent his money, his time, and his brains, he gives freely to the professional, and thus makes up tenfold for any little monetary deficit he may have caused, simply from the fact of his being an amateur.

Business, financially, has not been this season quite what our Transatlantic cousins call "a boom," but I do not think that amateurs have had much, if anything at all, to do with this; other causes have been at work: professional competition has been keener, the weather has been exceptionally bad, and the depression has not been confined to photographers alone, as almost all other professions and businesses have suffered equally.

That the amateur does in some instances do a not inconsiderable amount of damage to the business of the profes-



sional photographer I will not for one instant deny ; but perhaps I am wrong in terming him an amateur, the person in question being a sort of hybrid, neither an amateur nor a professional, calling himself the former, and yet entering into business competition with the latter. This gentleman, finding amateur photography rather expensive, places himself in direct rivalry with the professional by making a small charge for his work, "just to cover the cost of the materials," and, by so doing, does more harm than if he made a fair charge for the work done, and allowed himself a profit on the cost of materials. Many persons, were they told that there were undergraduates or students at our leading seats of learning taking portraits of their fellow-students at four shillings or four-and-six per dozen, would scarcely credit the fact, but that such is the case I can personally vouch for.

That the true amateur would not acknowledge such as these I am quite aware. It is to his interest as well as to that of the professional to speak out against them.

The idea of licensing professional photographers is, and undoubtedly must be, distasteful to the members of the profession generally. "Licensed photographer" would not look at all well either on a fascia or a brass plate ; true, the licence would do away with the middleman who claims to be an amateur and is not, but, all things considered, it will be better to put up with his existence than to be licensed like hawkers or publicans. We like to call our art science a profession, and a licence would sadly lower our status, not only in the eyes of outsiders, but in our own.

The true amateur is the professional's friend, and a fellow-worker, and it would ill become the professional to overlook the benefits that the art has received in the past from distinguished amateurs, because of a few black sheep among them, though decidedly not of them. Whether the club that was spoken about some little time ago, the members of which were to charge for their productions and give the results to charity, has fallen through, or not, I am not aware ; but there seems no doubt, to me, that the idea would be repudiated by all true thinking amateurs ; unless, indeed, the charity to which they gave their earnings were the "Photographers' Benevolent Society."

## CHAPTERS IN ELEMENTARY PHOTOGRAPHY— A GUIDE TO BEGINNERS.

BY W. M. ASHMAN.

NINTH ARTICLE.

AN efficient shelter from the influence of actinic light upon extremely sensitive surfaces must be provided before photography can be successfully practised with even comparative safety. Some kind of shield will be found indispensable at one stage or another in the manipulation of every photographic process. The nature and extent of the protecting agent may be varied to suit special conditions of sensitiveness. Thus, for example, silver chloride emulsion plates, such as are sometimes used in the preparation of lantern slides, are so feebly sensitive to the influence of artificial light that they may be developed by the light of an ordinary gas jet ; sensitized albumen paper may be exposed for many minutes without injury, in a room rather dimly illuminated with daylight ; an ordinary silver bromide dry plate, the quality of which would be seriously affected by an exposure of two or three minutes to the light transmitted through ruby and orange glass, whether its origin emanates from a lamp or diffused daylight, if held at a distance of several feet from the same coloured screen for half an hour would most likely be unaffected. And as a final illustration may be cited the cyanine and eosine-stained bromide plates. These are sensitive to the rays of low refrangibility to a very marked extent, which makes their value so great in orthochromatic photography. Hence, with sensitive surfaces of this

kind, ruby and yellow transmitted light, as an agent to illuminate a dark room, is almost as dangerous, or quite, as that of any other colour to be found in the solar spectrum, and absolute safety from fogging due to the action of light can only be depended upon by using no light at all. In practice, the employment of a very feeble light, as far removed from the plates as possible, is found to be the nearest approach to safety which can be obtained.

Purchasers of ordinary dry plates soon become familiar with the caution label, "To be opened only in the dark room." It is not intended, however, that the apartment referred to should be absolutely dark, but that the rays which are permitted to enter are those practically incapable of producing a latent effect (light fogging) upon the particular sensitive film during the period necessary for the plate to be exposed to its influence, as in exchanging a plate from one box to another, or the dark slide : from the latter to the developing solution ; and so on until the period arrives when the excess of silver compounds are removed by the process of fixation, the limit of safety is determined by the sensitiveness of the plate or other surface to certain bands in the spectrum. Were it not possible to regulate this in some measure, so that a comfortable and workable illumination can be provided, photography would be well nigh impossible.

There are numerous screens, portable and otherwise, which have been recommended for the purpose in view. Among the former may be mentioned the umbrella tent. It is composed of a ruby-coloured fabric which admits sufficient illumination for changing plates or development without the aid of a lantern. When extended umbrella fashion, and resting upon a table, there is sufficient room in the interior to work with ease. The head and hands of the manipulator, when inserted through holes in the tent provided for the purpose, enables the progress of the work to be watched. Any other form of tent, box, cupboard, &c., may be utilized, provided all light other than that of a harmless character be excluded. This is often accomplished by covering the article where necessary with two thicknesses of black twill and one of yellow fabric, sleeves of similar material being provided for the insertion of the manipulator's hands, and a hood for the head. A small window of suitable coloured media, or a lamp inside, affords the requisite illumination.

Although many useful contrivances can be made possessing special features of novelty, there is very little doubt about the superiority of a good size apartment, suitably fitted, over that of any other arrangement yet devised to fulfil the requirements of a so-called photographic dark-room. The choice of position, as well as the measurements of a dark-room, depend very much upon individual circumstances, but in the absence of limitations in these respects, a large and dry room offers advantages over one of small dimensions, as it affords greater facilities for working in comfort, and a more perfect system of ventilation can be provided.

The simplest plan is to block out all daylight from an apartment, and work by the meagre illumination afforded from a dark room lamp. Several patterns of these, fitted with various coloured media, are on sale at the dealers in photographic requisites, and some of them will be found effective and cheap. A lamp may be readily constructed out of a biscuit tin by making a large aperture in one side thereof, which should be curtained with deep orange paper similar to the kind some dry plates are wrapped in ; a hose-fitting lid with bent chimney, a few air-holes at the back and near the bottom, and a candle or small lamp burning inside, complete the arrangement. An iron frame which permits light to emanate from three sides is, however, better. By adopting this method, a work-room may be improvised at very short notice ; but when an apartment is likely to be used permanently for the purpose, arrangements of a more extensive character are to be preferred, and plenty of light of the right sort will



be found advantageous. Owing to the variability in quantity as well as in quality of daylight, many prefer to make use of artificial light, which is tolerably constant, and a favourite plan is that of placing a gas or paraffin lamp outside the apartment, so that the rays emitted therefrom may be transmitted through a suitable medium into the room, and the bye-products of combustion escape.

Among the mediums from which a selection may be made is deep ruby-stained glass (two thicknesses), a mixture of ruby and orange-stained glass, orange and yellowish green glass, deep orange paper; canary medium (a greenish-yellow paper of thick quality), ruby-stained fabric, and golden fabric (a kind of book-binder's cloth of a bright yellow hue); a screen composed of two thicknesses of this latter substance, measuring a yard each way, with a gas-burner consuming four cubic feet of gas per hour, fixed at a distance of eighteen inches behind the medium, will give very nearly the maximum amount of illumination allowable, thus enabling the work of plate-changing, development, and other operations requiring to be done in a special light being carried on with comfort and comparative safety. Red light is generally chosen, notwithstanding the fact that it is much lower in illuminating power. The writer, however, prefers yellow light, such as that referred to above, and it is only when plates are exposed in close proximity to such a light for an undue period there is any danger of the sensitive surface becoming seriously affected. When exposed for a few seconds at a distance of three or four feet from the screen, the light will be practically safe. The simplest way to test the safety of a medium is to expose one half of a sensitive plate at a given distance—say three feet from the light chosen, or at a point from it where the printed matter of these pages can be easily distinguished. Five minutes is quite as long as any plate is in practice likely to be left uncovered; therefore that length of exposure may be given. The plate should then be developed and fixed, when, if no very decided mark be apparent on the part which has been acted upon, the light will answer very well for dark room work. That rapid plates are more easily damaged by an unsafe light in the dark room than those of less sensitiveness will be readily understood; therefore, it is better to make the test with a so-called instantaneous plate. Fabrics and papers which have been dyed yellow or red are liable to fade by the continued action of light; therefore it is advisable now and again to test such mediums in the manner just described. When daylight is used by preference to artificial light, the obstructing medium will have to be proportionately greater, and fading takes place more quickly.

A dark room should never be permitted to become a storehouse for lumber, or, indeed, anything more than is really required to be used therein—a few shelves, benches, a good supply of water, and the means of carrying away the waste are conditions to be sought after in arranging a dark room. So also is some provision for effectually ventilating and regulating the temperature, so that the solutions do not become frozen in winter, or the manipulator stifled in summer. A rocking table will also be found convenient for the purpose of keeping solutions in motion during the process of development. Either the swing table or the knife edge principle answers. The suggestion of blocking all light from entering an apartment before fitting it as a dark room must be strictly observed in all cases; the test of efficiency in that respect being to shut oneself into the room without any lamp or candle in the interior. Every aperture admitting light other than that passing through suitable coloured media must be checked with paper, putty, or other opaque body before safety can be relied upon. Doorways are often most troublesome to deal with, but by constructing an inner doorway at an angle with the outer, there is less difficulty in trapping the light. Heavy curtains are also employed with a satisfactory result.

## TRANSFERROTYPE PAPER.

BY H. S. BELLSMITH, ROCHESTER, N.Y.\*

SINCE the meeting of our Convention a year ago, many useful and valuable discoveries and applications of photographic principles have rewarded the earnest research of the many enthusiastic devotees of our art. Among them are, perhaps, none of greater importance, and destined to occupy a field of greater usefulness, than ferrotype paper. Its many and diversified applications, and its unprecedented popularity, considering the short time it has been before the public, I think sufficiently indicate its importance and interest to the fraternity to justify a short paper explaining its manipulation.

Ferrotype paper is a paper designed for positive printing, prepared on the same principle as the American film, being an insoluble sensitised emulsion coated upon paper previously prepared with a substratum of soluble gelatine. Prints can be made, either contact or enlargement, by artificial or day light, and should be developed with oxalate and iron developer, and treated in precisely the same manner as bromide paper—the same formula being used for the developer, clearing solution, and fixing bath. After the print is washed in (say) five or six changes of water (in warm weather ice-water is necessary), the print may then be transferred to any surface that will resist the action of hot water, the method of procedure being as follows. Take a sheet of porcelain, plain glass, or such material as it is desired to transfer the picture to, and, after washing thoroughly, and while wet, place the print (which must also be wet) face down, and squeegee in contact. Remove as much of the moisture as possible by wiping the squeegee on a cloth between strokes, then place under pressure, with a sheet of blotting-paper next to the print. After thirty minutes it will be ready to strip, but may be allowed to dry thoroughly and will strip with just as much ease, the only difference being that the water must be hotter when the print is dry. Take the plate containing the print, and put into a dish containing water at a temperature of 110° Fah., when the print is wet, and 120° when dry; allow it to soak about two minutes, and then with a pin pick up one corner of the paper, being careful to avoid touching the film. If the water is of proper temperature the paper will separate readily, and can be removed with ease and certainty, and without any injury to the picture, which it leaves on the plate. In case the paper does not strip easily, add hotter water. After removing the paper, take a tuft of cotton and dip into the warm water; wash the surface of the picture carefully, to remove any remaining substratum. The plate should then be put into an alum bath for a minute or two, then rinsed under the faucet, and after passing the squeegee over the print very lightly to remove the surplus water, put into a rack to dry.

The great number of uses to which the ferrotype paper may be applied are quite remarkable. Among those materials to which it has been transferred successfully are porcelain, china, wood, papier-mache, canvas, ivory, celluloid, leather, silk, gold, silver, nickel, shell, iron, brass, tin, marble, and plain and ground glass.

For pictures which are required to be looked at in reflected light, the print should only be developed to that strength that you wish it to retain when transferred. But if the picture is desired for the purpose of transferring to lamp-shades, window-panes, or where transparencies are desired, the print must be developed very much darker, and can only be judged correctly by looking through it, as in developing a negative. In this way the most beautiful transparencies and lantern slides can be made. For window transparencies the better way is to transfer to plain glass, and back up with ground glass, turning the film side toward the ground glass, thus protecting the surface, as well as giving an unreversed picture. Prints made by contact, after being transferred, will be reversed. In making enlargements this can be easily avoided by reversing the negative in the camera. If an unreversed picture is required on porcelain the same size as the negative, it can be done in the ordinary manner of making transparencies with the camera by placing the negative in the window, back toward the lens, and using the paper in the plate holder, in which case the ordinary film carrier is used to hold the paper. Perhaps the most important use to which this paper has been put is to transfer to artist's canvas. By this method the most brilliant prints can be obtained, fully equal in strength and detail to enlargements on paper, an

Read at the Minneapolis Convention of the Photographers' Association of America.



achievement that has not been accomplished heretofore by any other process.

To prepare the canvas for transferring, use :—

Whiting ... ..	5 ounces
Warm water ... ..	5 „

Mix to a cream, and add—

Gelatine (white hard)...	1 ounce
Water...	6 ounces

Mix thoroughly, and add—

Glycerine ... ..	1 ounce
Chrome alum ... ..	60 grains
Water ... ..	5 ounces

Apply quite warm, with a sponge, going once over. When dry, sand-paper down smooth. Give two or more coats, sand-papering each time, until the desired surface is obtained.

In making solid prints where rich blacks are desired, a good plan is, after wetting the print in plain water before development, to pour off the water, and soak for a moment in acetic acid clearing solution; following this immediately with the developer. This will not only preserve the blacks, but the paper takes up sufficient of the acid to prevent precipitation of the iron during developing, thus preventing yellowness. This method also applies to the use of bromide paper.

New applications are constantly being found for this useful photographic paper. Recently it has been adopted by the calico print factories for transferring the patterns or designs to the metal plates for engravings, with satisfactory results. Formerly the designer was obliged to draw his pattern the exact size required when printed, duplicates being required, one for each colour used. With the valuable aid of transferotype paper the design may be drawn on a small scale, a negative taken, and then enlarged prints made, one for each etching plate required. The prints are then transferred to the zinc, and the pattern etched through the film. At first it was feared that the expansion of the gelatine when wet would change the drawing of the design, and prevent the impressions from the different plates from registering correctly; but this fear has proved to be groundless, as it has been found that the several prints swell when wet, and contract when dry exactly alike, and register accurately. This opens up a new and extensive field for the use of photography.

Wood-engravers have long felt the want of a reliable, simple, and cheap method of photographing on box-wood. All the methods that have been in use heretofore have been so difficult and generally unsatisfactory that they have been but little used. With the transferotype paper the difficulty is solved. The manufacturers are now making a special paper for this purpose, the only difference from the regular paper being that the coating of emulsion is very much thinner, so that when transferred to the wood an exceedingly thin film covers the wood, which, with the application of a little glycerine, is rendered capable of being engraved for the finest line work without chipping or forming an appreciable difficulty to the engraver.

For lantern slides transferotype paper is particularly well adapted. I have recently given demonstrations before the principal photographic societies throughout the country, where I have projected pictures upon the screen from slides made in this way, where they have received the highest praise, and have invariably been acknowledged fully equal to the best glass slides.

But the main question with probably the majority of my hearers is, what practical use can we put it to in the studio whereby our receipts can be increased? There are several ways in which it may be made of practical value. First, in transferring to opal glass. The print is quickly and easily made, and the transferring as simple as the result is beautiful. The cost is small. For  $4\frac{1}{2}$  by  $6\frac{1}{2}$  opal or porcelain pictures the cost for material is but a few cents, including the opal glass. Pictures can be transferred to watch dials, or the inside gold watch-case, the brightly burnished gold forming an excellent ground, and making a novel and interesting result.

The film, when transferred to porcelain or opal glass, forms an excellent surface for finishing, either in water-colour, India-ink, crayon, or pastel.

The ease and certainty of the manipulation, the great diversity of its applications, the surpassing beauty of its results, and low cost of the material used, bespeak for transferotype paper a success and future usefulness that can hardly be over-estimated.

## "OLD BATHS:" THEIR TREATMENT AND VALUATION.

BY JOHN YOUNG.\*

PROBABLY no more embarrassing problem engages the attention of the photographer than that pertaining to the proper disposition of foul and refractory baths. In discussing this interesting question with various photographers, we have been much struck by the diversity of opinions expressed as to the best mode of treatment, from which it is evident that the sunning and boiling down process is the one meeting with most general endorsement. It will be admitted, however, that there are occasions when such treatment is incapable of bringing about the desired results, after which, as a last resort, it is sent to the refiner for reduction.

Of course, to many of the more prosperous among the fraternity, this plan affords an easy way of getting rid of further trouble, and the incident loss is but lightly felt. On the contrary, however, with the great majority, this method of disposing of the bath is a very serious matter indeed. It may happen, as it often does, that the bath in question is the only one at hand, and supplies of nitrate silver are not always available; while at such a juncture, printing operations must necessarily be suspended and the routine of gallery work seriously disturbed. Now this renovation of those baths, by any ordinary intelligence, is an exceedingly simple matter, and we are sure no refiner in good standing, who had the interests of his patrons at heart, would advise the shipment of such solutions, when at a very small expenditure of time and practically no expense, these baths may be renovated by the operator himself, thus effecting a pecuniary saving commensurate with the volume of silver solution to be treated. By attention to the following simple directions, it will be found that such solutions may be purified, and the silver regained on short notice, with the most satisfactory results.

Any printing or negative bath which refuses to yield to the usual mode of purification, may be placed in one or more large bottles, so that the baths will occupy one-half of the containing vessel. A strong solution of caustic potash should now be prepared and added to the silver solution so as to form a precipitate; after a few minutes, a further quantity of the potash may be introduced, until the whole of the silver has been deposited from the liquid in the form of oxide of silver, a compound, by the way, which is exceedingly susceptible to treatment by most of the common mineral acids. A glass funnel, containing a filter of good Swedish filter-paper, should now be placed in position, into which the solution, together with the brownish-black deposit, may be thrown, and permitted to drain. The solution which passes through is valueless, and contains only nitrate of potassium and other impurities. The sediment in the filter may now be washed with a little warm water, and finally introduced into a porcelain evaporating dish of good size, and treated in the following manner. Procure some chemically pure nitric acid and mix it with distilled water, if possible, in the proportion of four ounces of the acid to six of the water. This will be sufficiently strong to attack the silver oxide, and may possibly produce more or less violent ebullition in the dish; it is necessary, therefore, as previously stated, that the dish should be of ample dimensions, so as to obviate possible loss of the silver solution by boiling over. A small quantity of the acid thus diluted must be added from time to time, until no further sediment remains at the bottom of the vessel. No more acid than is absolutely necessary should be used, owing to the fact that it must afterwards be eliminated from the solution by evaporation, hence the use of any great excess only enhances the trouble in rendering the silver approximately neutral. After the acid has entirely decomposed the silver oxide, the result will be a more or less acid solution of pure nitrate of silver. To remove the excess of acid referred to, place the porcelain dish with its contents on a sand bath in a warm place, continuing the evaporation until the whole of the water and excess of acid has been entirely removed. Towards the end more heat may be applied, as it is necessary to have a somewhat high temperature in order that the last traces of the acid may be expelled. A mass of small white crystals will now be perceived, the latter being nitrate of silver in an imperfect crystalline form. All that remains to be done is to allow the silver to cool, and then, after removing from the dish and weighing, to add the usual amount of distilled water. A splendid working bath will now have been made. The time occupied in doing all this is comparatively short, and as in this instance it is not necessary to produce large crystals, fit for the market, there is no reason why the whole operation may

\* Extracted from the *St. Louis and Canadian Photographer*.



not be conducted by a bright boy, under the supervision of the photographer himself. Money will thus be saved, and little time lost.

In this connection it may be stated that the method thus recommended is not that which is generally adopted by professional refiners of photographic residues, but is by long odds the one best adapted to the circumstances of the ordinary photographer, who has neither the apparatus nor technical knowledge necessary to enable him to dispose of it otherwise. In the treatment of these old baths by the professional refiner the process of reduction is accomplished entirely by aid of heat; after the precipitate (which is invariably silver chloride) has been thoroughly dried and mixed with the necessary chemical compounds, a button of pure silver is obtained, and after being tested and weighed, its value (based on the market price of silver bullion) is credited to the photographer, and returns made to him in nitrate of silver or cash, as desired. It will thus be seen that the adoption of this plan necessarily involves quite a loss to the photographer, as all the profits incident to the manufacture of the nitrate of silver in the first place, and the further profit naturally claimed by the dealers in photographic supplies, have all to be borne by the photographer; while in addition he must be prepared to take into account the charges of the refiner, postage and express charges, &c. When these charges are aggregated, it will be found that when baths are shipped to the refiner a heavy loss must necessarily be incurred, amounting generally to about fifty per cent. of the retail value of the nitrate of silver. A few moments' reflection will show how it cannot be otherwise. There is no way of averting this loss, unless the operator undertakes the work of purification himself. The disposition of this description of residues has always caused us an infinite amount of concern and trouble, and in business communications with our patrons (the majority of whom can ill afford unnecessary expense), we have always said, "Never send us your baths to renovate, if you can possibly fix them yourself." By so doing we miss the small profit accruing to the work, but we have at least the satisfaction of having saved our patrons' time and money.

A good deal of misconception exists among photographers regarding the monetary value of these old baths, positive or negative. The hydrometer is the instrument ordinarily used on which to base the necessary calculations. Now while this instrument is comparatively reliable when used in testing pure solutions, it is worse than useless when introduced into baths which may hold in solution unknown quantities of albumen and other soluble matter, and in the case of negative baths, iodides, and similar incidental impurities. In such cases, as already stated, the hydrometric test is essentially erroneous. In cases where it is necessary to determine the value of the silver, a very convenient way is simply to precipitate the silver as an oxide, by a solution of caustic potash, and from the weight of the perfectly dried precipitate calculate the amount of metal that is contained in the compound. To illustrate, let us suppose that the silver has been precipitated by caustic potash in the manner described, the resulting precipitate, which is pure oxide of silver, is filtered off, and washed with warm water, and afterwards dried in the most thorough manner. From the weight of the dried oxide the percentage of pure metallic silver can easily be ascertained—a simple matter, indeed, when it is borne in mind that in nature all elements, when combining together to form compounds, do so invariably in certain definite proportions. In the case before us we have on the one hand silver nitrate, which is simply metallic silver dissolved in nitric acid and diluted with more or less water; and on the other we have the precipitating agent "caustic potash," a compound containing potassium, hydrogen, and oxygen. When the silver solution is treated with the potash new compounds are necessarily formed. On the one hand we have produced oxide of silver, and on the other, nitrate of potassium, which is in solution, and therefore not discernible. Now, as chemists have ascertained that pure oxide of silver contains 216 parts of silver, combined with sixteen grains of oxygen, it will be seen that the amount of pure silver in the oxide is fully ninety-three per cent. or, in other words, each ounce (avoirdupois) of the oxide will contain 406 grains of the pure metal, neither more nor less, and if it be borne in mind that the proportions never vary under the circumstances referred to, it will be seen that an infallible method of determining the percentage is always available.

In other compounds of silver—the chloride, for instance—the proportion of silver is very much less, viz., 143½ grains of silver chloride will yield only 108 grains of the metal. If perfectly dry and pure, this will equal about seventy-five per cent., and so in a similar manner may the proportion of silver be ascertained,

when present in any definite compound, by reference to those numbers which are usually designated the "combining proportions," or, in chemical parlance, "atomic weights." An intelligent understanding of the proportions in which silver combines with the various elements and compounds used in photography is of immense value to the progressive photographer, and when once acquired, much of the dissatisfaction so often expressed on the amount of silver extracted from those baths would be obviated, and perfect confidence restored. The refiner would then be indeed a happy man.

#### THE INTERNATIONAL COPYRIGHT CASE.— JUDGMENT.

Mr. A. E. WHITEHOUSE, of the Hyde Park Gallery, St. George's Place, Knightsbridge, attended to an adjourned summons at Westminster Police Court yesterday, charging him with pirating and multiplying for sale the registered copyright photographs of Messrs. Adolphe Braun and Co., of Paris. Mr. Mann appeared for the prosecution, and Mr. R. Cunningham Glen for the defence.

The summonses were taken out under the Copyright Act of 1862, and the contention of Mr. Mann was that this statute incorporated the provisions of an Order in Council made ten years before, and the old Copyright Act of 1844, by which reciprocal copyright privilege was given to English and French authors, and producers of works of art.

A great deal of argument of a technical character took place as to the rights conferred on foreigners, and the intention and construction of the old statutes on International Copyright, and Mr. Mann urged that the case for the prosecution was strengthened by the recent Copyright Act of 1886, and an Order in Council of Nov. 26, 1887, which carried into effect the agreement of the Convention of Berne, giving an author of a literary or artistic work first produced in one of the foreign countries of the Copyright Union, the same right of copyright as if the work had been first produced in the United Kingdom.

The evidence as to fact established the sale by the defendant of alleged pirated photographs of well-known salon pictures. There was, moreover, an admission by the defendant that the printing of the pictures had been delayed by wet weather, and the sworn opinion of experts that the photographs did not emanate from Messrs. Braun's studios, and that they were reproductions from reduced negatives.

Mr. Glen urged that no Act or Order in Council anterior to 1862 could affect the issue, as the statute passed in that year first alluded to photographs. Also that the 1887 Order in Council did not come into operation until January of this year, long after the date of registration of Messrs. Braun's photographs. The defence was also set up that the defendant was only a manager of the Hyde Park Gallery business, appointed by a trustee for creditors.

Mr. D'Eyncourt at considerable length reviewed the facts, and gave his reasons for coming to a decision adverse to the defendant. For the offence disclosed in one summons he convicted, and ordered defendant to forfeit £10 to the complainant and five guineas costs.

Mr. Glen asked that there might be a stay of execution, so that the defendant and his advisers could consider whether his Worship should be asked to state a case.

Mr. D'Eyncourt: Yes. It is a sort of civil proceeding, compensation to be given to the prosecutor. There are a good many holes of escape, and my judgment may be reviewed.

It was stated that the negatives of the photographs in question had been broken.—*Daily News*, Sept. 14.

#### Notes.

The time has again come round for making preparation for the issue of the YEAR-BOOK OF PHOTOGRAPHY; and once more we ask for the co-operation of our readers in sending us such experiences as may be useful to their fellow-workers.

Short papers on points of everyday practice are the most acceptable, and it is the circumstance that almost everyone who has a clever arrangement for facilitating work, or a



useful modification of an existing process, sends an account to the YEAR-BOOK, which has made the series of YEAR-BOOKS a much sought-for addition to every photographic library, and the current YEAR-BOOK an essential to every photographer wishing to keep himself abreast of the times.

Those sending articles for the YEAR-BOOK should forward them promptly.

In a recent issue we alluded to the advantages which photography offers to the student of geology. We learn from the *English Mechanic* that a project is under consideration to form a collection of photographic views illustrating the geological features of each county. Isolated attempts to record local geological features of importance have been made by several provincial societies, but there is need for some systematic scheme to secure uniformity of action in every district in England.

London correspondents of provincial papers are always making wonderful discoveries. The latest runs thus: "Tacticians think there may be considerable light thrown on an enemy's movements by a clever man going aloft in a balloon, and coming down beneath a parachute, taking instantaneous photographs all the while by means of a gun camera." It would be interesting to know who the said "tacticians" are. Perhaps one of them would try the experiment, and see how many photographs he could take "all the while by means of a gun camera." Having settled this point, it would be as well if a dummy figure were made to descend, while the "enemy" made shots at it. We are inclined to think the number of hits would greatly exceed the photographs taken.

Some time ago we protested against the senseless fashion of sticking kittens' heads on photograph frames. How the kittens were procured we have no means of knowing; but from the numbers which were exhibited, there is little doubt they were killed for the purpose. A large proportion of kittens, it is true, are born only to be drowned, but the kittens we refer to are of larger growth, and past the drowning stage. We refer to this matter because the *Echo* this week enters its protest against the practice, remarking that there is absolutely no excuse for the use of the kitten in the way we have mentioned. Every one will agree with this opinion.

It is a wonder that the dog who, it is said, would not leave the studio of a well-known photographer at Cowes until he had his likeness taken, has not become the celebrity of the silly season. This animal, we venture to say, showed more intelligence than the well-known dog who, having been treated at a hospital for a hurt, brought two or three wounded companions to be doctored. It is true that we are left in doubt as to the exact motive of the dog in being photographed, but this is not of much importance. Whatever explanation be given, the extraordinary sagacity of the creature remains unimpeached. It is not to be supposed that dogs possess albums, and therefore he was not photographed with the object of

giving away copies. Nor can his object have been the mere gratification of vanity, because the letter in the *Isle of Wight Times* expressly says that the dog left immediately the photograph was taken, and has not returned. We are therefore forced to the conclusion that the dog was lost, and it took the best means of conveying information of its whereabouts. No doubt it went away under the impression that copies of its portrait would be sent to the various police stations, and we hope that its wishes—which so intelligent a dog would find a way of conveying—have been duly attended to.

Photographs are akin to water-colours as regards the effect which moisture has upon their permanency. It is an established fact that photographs exposed in a damp situation soon fade, and the same result follows as to water-colours. Dr. Arthur Richardson, who read a paper on the subject before the British Association, divides colours into two groups: those which bleached by oxidation under the combined influence of light, air, and moisture; and those on which light exerted a reducing action, which was independent of the air, and in some cases took place in the absence of moisture. He condemned as unsafe those pigments which faded in dry air—for the reason, we presume, that if a colour was unstable in dry air it was bound to be more so in moist—and showed that the greater number of paints were stable in sunlight, provided moisture were absent. It is curious to note, however, that moisture, which is the water-colour painter's *bête noir* so far as the finished drawing is concerned, is his best friend while the work is proceeding. It is owing to the humid atmosphere of England that water-colour painting has reached here a standard to which no other country has attained. The reason is obvious: when the air is dry the colours cannot be manipulated to the same extent as is possible when it is moist, and the effect is liable to be hard and unnatural. In a very hot climate water-colour work must be beset with difficulties.

The various uses which are now made of photography in scientific research were well illustrated at the recent meeting of the British Association. There was probably not one of the Sections in which some application of photography was not referred to. In the discussion on lightning conductors, carried on jointly by the sections of Physics and Mechanics, a good deal of attention was devoted to the photographs of lightning flashes exhibited by T. Abercrombie. The so-called "dark" flash came under discussion. H. Trueman Wood disposed of the suggestion that it was due to over-exposure, by pointing out that where the black and white flashes crossed, the white showed over the black one, and suggested that the appearance was really due to halation or to reflection, pointing out that a precisely similar line was to be seen in another photograph which was obviously due to halation, and followed the line of one of the bright flashes. Lord Rayleigh mentioned a suggestion of Professor Stokes's, that the chemical combination of oxygen and nitrogen resulted in products which were very opaque to the higher rays, and that therefore the path of a lightning flash might be marked by a line of



such products which would photograph black against a light background.

The report of the committee on a standard of light holds out but little hope. For the practical work of gas measurement, the committee recommends the adoption of Vernon Harcourt's "Pentane" standard in place of the Parliamentary candle, but it is unable to suggest a unit. Some interesting experiments were carried out by some members of the committee on M. Violle's proposed unit, the amount of light given out by a square centimetre of platinum at the instant of fusion. In these the platinum was fused by the oxy-hydrogen blow-pipe and by the electric current, and the results appear to indicate that the light when tested in the photometer was by no means absolutely constant. The difficulties in the way of constructing an incandescent lamp which might serve as a unit are also, in the present state of our knowledge, too great to be overcome. The question, therefore, still remains open for the ingenious investigator.

A sermon is no better for being dry and uninteresting, and the example of a gentleman who last Sunday at Wardour Street Hall introduced the magic lantern to illustrate his subject is one that might be followed at other places. Photographic views of Palestine abound, and it would be the easiest thing in the world for a clergyman to preach a sermon, the topographical allusions in which might be brought with great vividness to the mind of the congregation by throwing pictures on the screen. We do not know what the bishops would say, but it might be fairly argued that showing a photograph of the Holy Land in a church is not worse than the exhibition of a High Church bishop in full canonicals in a shop window side by side with the pictures of notorieties more or less reputable.

The importance of photography in regard to the "Parnell" documents was rightly insisted upon by Sir Charles Russell at the preliminary proceedings of the Commission. The counsel for the *Times* represented that they had had *fac-simile* copies taken by a process which was very similar to photography, and these copies they were willing to supply. This offer, however, Sir Charles Russell refused, observing that if they were like the reproductions in the *Times* they would not do. Ultimately it was decided that the *fac-simile* copies should be furnished, and if they did not suit, the application could be renewed. This arrangement is, no doubt, fair enough, but what one would like to know is, what is the process which is very like photography, and is yet not photography?

Last week we referred to the Exhibition of the Cornwall Polytechnic Society, giving some particulars about the collection of photographs. The local and other prints seem quite incapable of making sensible remarks about the photographs, but merely indulge in strings of meaningless superlatives. Here are examples from the *Royal Cornwall Gazette*:—"Mr. J. Lafayette, of Dublin, exhibits two *genré* pictures, *perfect specimens* of the photographer's

art. Mr. W. J. Byrne, of Richmond, makes a fine exhibition of instantaneous photographs of the Jubilee Procession. The pictures are *perfect in every way*." The same paper speaks of a medal being awarded to "Perrow's Photographer's Clock."

From Hart and Co., of Upper Bedford Street, Brighton, we receive two photographs on their Celluloid Tablets. The general appearance and character are very attractive and brilliant, the surface being like an enamel, and the photographic image being confined to a thin transparent film. From a communication accompanying the photographs, we gather that Messrs. Hart either are about to put the sensitised Celluloid plates upon the market, or that they have already done so.

## Reviews.

MASON AND Co.'s PHOTOGRAPHIC GUIDE. Price One Shilling. (*Mason and Co., Sauchiehall Street, Glasgow.*) We have here a concise and clearly written hand-book dealing with the methods in common use among photographers, and also including a number of the processes of secondary importance. The book also serves as a price list of the house issuing it.

## PHOTOGRAPHY AND PREACHING.

A CORRESPONDENT writes:—I have been staying the last few weeks at a very well-known watering place in the Isle of Thanet, and have been much amused at the ingenious way in which a partnership between an itinerant photographer and an out-door preacher is worked. The *modus operandi* is something in this fashion. After the preacher has gathered his congregation and has got them into a placid state of mind by the singing of a hymn, he looks round with a smile and says, "My dear friends, before we proceed any further, I should like to mention that it has occurred to me that, as we are here assembled, it might be interesting to some of you if a photograph was taken as you sit. Our friend here says that the light is exceedingly favourable, and that the operator will not take more than a few seconds. Is that so?" (*to photographer.*)

*Photographer (promptly).* Certainly, sir.

*Preacher.* I hope you'll clearly understand that this is quite a voluntary act on the part of Mr.—Mr.—Mr.—what name?

*Photographer.* Smith, sir.

*Preacher.* Yes, Mr. Smith; and that it involves no charge. But, of course, if any of you would like to take away a memento of an interesting occasion, you are quite at liberty to do so. The copies are—ahem!—what did you say the price was, Mr. Smith?

*Photographer.* A shilling each, sir.

*Preacher.* Quite so—a shilling each. Now if you please to keep quite still while Mr. Smith is making his preparations, I have no doubt we shall get a beautiful picture, and then we will proceed with the service.

Whereupon the photographer gets to work, and generally manages to dispose of a dozen copies or so. The first time I saw this performance I thought the preacher desired to give the photographer a good turn; but when I saw it repeated day after day without a variation of the formula, I began to get rather sceptical. The assumption of ignorance on the part of the preacher as to the photographer's prices, and the apparent spontaneity of the whole thing, was delightful, and, after a time, I began to look upon the business as part of my morning's entertainment on the sands. Neither from a religious nor from a photo-



graphic point of view have I the slightest objection to the arrangement; but what I would like to know is, whether the religious service is held in the interests of the photographer, or whether the photographs come in to assist the preacher and make his service a little more lively than it otherwise would be. Then, again, comes the conjecture, does the preacher get a commission on the taking of the photographs, and if so, what percentage? Up to the present I have not been able to find out, and the precise terms of partnership remain one of the mysteries of the seashore.

### ON WORKING BROMIDE PAPERS IN INDIA.

BY A. E. CAREY.\*

It will scarcely be supposed that during the dreadful weather we have just had any amateur photographer who could help it, has done more than glance at his apparatus and wipe his beaded brow at the very suggestion of setting it up. Having found my dark room the coolest place in the house, —90°F. actually, when it was 100° in the room above, 98° in the adjoining hall — I took refuge there, and made a few enlargements and bromide prints. One had to be very careful in the washing of these; as they grew slimy, and yielding to the touch, the gelatine film leaving the paper easily, squeegeeing was out of the question, and an alum bath had to be relied upon to remove the last traces of hypo.

Perhaps my way of working the bromide papers may interest some readers. Others, I hope, will forgive the repetition of a twice-told tale.

A card in my developing room gives me a serial memorandum of what I have to do.

I provide three or four bottles capable of holding about four ounces of water each, which have each a file cut at three ounces; to this mark they are filled with a saturated solution of potassic oxalate, which has been tested for acidity, a drop or two of sulphuric acid having turned the blue litmus paper red.

Then there is a test-tube carrier, which holds a dozen half-ounce test-tubes. Each is filled with a saturated solution of sulphate of iron acidified with citric or tartaric acid; and, as all test-tubes do not hold the same quantity exactly, bright green crystals of iron photo-sulphate are dropped into the measured half ounce to quite fill the tube to where the cork comes. Both tubes and corks are paraffined. A few grains of paraffin dissolved in benzine makes the stock solution, and this is poured from one tube into another, and from the last back into stock. The corks also are dipped in this. Any one who has tried to clean an iron-stained bottle will appreciate this preliminary operation. A dropping tube which will hold just half a drachm of a 12-grain solution of potassic bromide, and a stock bottle containing a few ounces of this solution, complete the developing solutions.

Some acid in a wide mouth bottle with a large pad of cotton wool over it is also at hand; a lemon or two squeezed into a small tumbler will do very well, the precaution having been taken to run it through a muslin filter.

For a 15-inch print 3 ounces is ample. Before developing, the exposed print goes into a large tray of sweetened water, a large table spoonful and a-half of sugar having been added to it. Contrast is increased and the tone improved by this method. Several prints may go in at once.

My developing tray is a sheet of double tin the size of the paper, half an inch being turned up all round, giving an inner angle of about 120°; the corners are cut away, leaving a wishid slit for the angles of the paper to fit into; a coat of paint improves it. Well, a few drops of water are sprinkled into this tray, and the paper laid down diagonally, so that air-bubbles may not form. The corners are pulled out at their respective openings, and then it is stood on end to drain awhile.

In the mean time you take one of the three ounces of oxalate, add to it half a measure of potassic bromide, and appropriate to it one tube of iron. Don't put in all the iron at once; you will know by-and-by if more should be added.

The contents of this bottle should now deliberately be poured over the paper and led all over, if necessary, with a slip of paper. If in half a minute the image does not show up, pour back into the bottle and add the balance of the iron.

If properly exposed under a suitable image the picture should

acquire force and great depth of shadow only in hut not before the highest points of light alone are white. Before this point is reached pour back the developer into its bottle, and quickly flood the picture with acidified water; take now the cotton wool and gently work it over the whole surface of the print, changing once or twice the acid water. It may now be removed into another dish, where it may remain till the hatch has been developed. The water in this tray should be distinctly acid.

One can do all this in less time than the writing takes. A little practice will make it all very easy; one thing, do not neglect to make notes of exposures and strengths of developing solutions (that is, ratio of iron to oxalate); this will supply valuable experience in an available form.

*Note.*—A very thin negative wants the shortest possible exposure with the strongest development, the rationale being, that if the developer will succeed in just blackening a piece of paper held in the most transparent part of the negative, it will rapidly fall short of darkening when there is the slightest obscurity. This may be emphasised by yellowing the light by somewhat turning down the lantern lights or placing thin yellow paper between the light and the negative, with a corresponding increase of exposure.

A thin fogged negative will require the exposure to be increased till the shadows blacken as above, and somewhat less iron in the developer. Dense negatives are difficult to manage.

*Long exposure.* developer weakened by the addition of very weak solution of potassic oxalate, and a decrease in the quantity of bromide. This will correct the tendency of Eastman paper to run to contrast. Morgan and Kidd's is better under control for printing from strong negatives.

The developed and washed prints are put into hypo one to six, to a pint of which half-an-ounce of a ten-grain solution of soda bicarbonate is added, and in quarter of an hour fixation is complete and the washing commences. When it is cold enough the squeegeeing of each print is a safe means of rapidly washing the hatch; but during these dog days, an hour's washing has been long enough to make it a difficult matter to save the picture; the corner of one picture drawn over another may leave a white line across it, or the corners may slip from the hand, leaving the darkened gelatine soiling the fingers. It is therefore best to use a strongish solution of alum towards the finish, and make the last washing in ice cold water. After draining completely, the pictures are carefully lifted off the tray and placed on a flattened sheet to dry.

To reduce the densest negative to a good printing depth I have found the following plan very useful. Place the dry negative in water, and when uniformly wet transfer to a dish containing:—

Potassic bichromate ...	...	...	...	10 grains
Acid hydrochloric ...	...	...	...	10 mins.
Water ...	...	...	...	1 ounce

The denser parts chlorise rapidly in this solution; while the bloom the plate acquires in drying enforces all the weaker shadows, which, if anything, seem to gain more vigor.

A very thorough washing is necessary to remove the yellow bichromate.

Density may be given to a weak negative by following up this treatment with an application of the ferrous oxalate developer.

For local reduction the above solution with a little gum water painted on to dense portions reduces these spots to the desired degree. Again a negative so treated may have any portion reduced to bare glass by painting it out with strong gum, and a drop or two of saturated solution of soda hyposulphite, washing the whole plate instantly, the desired effect is produced. The gum is used to keep the chemical in its place.

All negatives, dense or weak but unfogged, are levelled up with this chlorizing solution, for which we are indebted to Mr. Carey Lea, an amateur photographer whose name was a household word among photographers long before the gelatine plate found its way out of the laboratory. To him also we owe the ferrous oxalate developer.

### Patent Intelligence.

#### Applications for Letters Patent.

13,149. JOHN WALKER NEWALL, United University Club, Pall Mall, London, for "An Improved Method of Determining the Sensitiveness of Photographic Plates."—Sept. 12th, 1888.

\* *Journal of the Photographic Society of India.*



13,267. FRANK BISHOP, of the firm of Marion and Co., 53, Chancery Lane, W.C., for "An Improved Machine for use in Beveling and Gilding the Edges of Photographic and other Cards or Mounts."—(*Théophile Monchau*, France.)—Sept. 13th, 1888.

#### Specifications Published during the Week.

7,067. AUGUST FUHRMANN, of Passage, W. Berlin, in the German Empire, Panorama Proprietor, for "A Revolving Stereoscopic Panorama."—Dated, 12th May, 1888.

The patentee says:—The ordinary panoramas in which stereoscopes are used to magnify and render corporeal the pictures, have the disadvantage that the spectator is obliged to pass from one ocular to another, and that he may remain as long as he pleases at any one of the pictures.

The necessity of proceeding from picture to picture causes great inconvenience, for with a somewhat extensive programme the visitor becomes tired, and inspects the last pictures only cursorily. But the liberty left to the visitors to remain as long as they like before any picture causes still greater inconvenience, and interferes with the regular utilization of panoramas of this kind, for as one picture attracts one visitor, and another picture another visitor more than some others, he will remain sometimes a very long time before the picture that pleases him, and the following visitors are compelled to wait for him. This irregularity causes an obstruction in the circulation, or a collection of spectators at some of the pictures, by which the time for passing through the panorama is unduly prolonged, and the number of spectators that can be admitted is greatly limited.

All these drawbacks are obviated by my invention, which consists in arranging the different stereoscopes in a circle and causing them to pass before the spectators, who sit in a circle, at certain intervals, so that said spectators not only can view the pictures in a comfortable position, but that the whole presentation of the panorama takes place within a certain definite time, during which each picture is brought before each individual spectator.

The claim is:—The arrangement of circulating stereoscopic panorama with a polygonal or circular shell containing the oculars, behind which the stereoscope boxes, ranged in a circle, are rotated intermittently by hand or by self-acting mechanism round the centre of the apparatus, so as to be brought successively before each ocular, substantially as hereinbefore described and illustrated by the drawings.

13,844. THOMAS RUDOLPH DALLMEYER, 19, Bloomsbury Street, in the County of Middlesex, Optician, and FRANCIS BEAUCHAMP, of High Cross, Tottenham, in the County of Middlesex, Engineer, for "Improvements in what are known as Instantaneous Photographic Shutters."—Dated October 12th, 1888.

According to this invention, the shutters are formed of two flat plates meeting together in a line which passes across the centre of the lens, the plates being capable of being moved away from one another in a straight path. To cause the shutters to simultaneously move towards or from one another, two lever arms are used; the axis of the arms are in proximity to one another, and the arms are there geared together by a toothed quadrant on one gearing into a toothed quadrant on the other. In each arm is a slot, and a pin projecting from one shutter is made to enter a slot in one lever arm, and a pin on the other into a slot in the other arm. A crank pin carried by a small crank axis enters a slot in one of the lever arms.

The axis can be turned by a coiled spring, and, whenever allowed to turn, can be arrested by a stop when it has made a complete turn, or approximately so.

When allowed to turn from one extremity of its movement to the other, it first opens the shutters and then closes them.

The duration of the exposure can be varied by applying an adjustable friction brake, or by varying the strength of the coiled spring.

The apparatus shown on sheet 1 of the drawings hereunto annexed is suitable for being used with a camera fitted with an ordinary dark slide. The apparatus shown on sheets 2 and 3 can be used without any dark slide. The opening of the shutters in this apparatus can also be controlled from the back end of the camera, and can be used in cameras adapted for taking a number of pictures quickly in succession.

The apparatus shown on sheet 4 has in it an adjustable friction brake for varying the duration of exposure.

On sheet 1, figure 1 is a front view of the shutter mechanism; figures 2 and 3 are front views with the front plate removed. In figure 2 the shutters are in their closed position, and in

figure 3 are shown fully open. Figure 4 is an edge view, and figure 5 a section on the line *a b* figure 1. Figure 6 is a longitudinal section through the casing within which the shutters are carried. Two or more views of each of the moving parts of the mechanism are also shown separately. These are marked with the same letters of reference as in the other figures.

The casing of the shutter mechanism is composed of a plate A, the front face of which has recesses formed in it for the shutters and levers which work them to lie in, whilst the back face has secured to it a short screw threaded metallic tube B to be screwed on to the outer end of the lens tube. The front of the plate A is covered over by the cover-plate C.

DD are the two shutters, formed of thin flat metallic plates; they can be slid towards or away from one another in a rectangular recess in the front of the plate A; EE are the levers by which the shutters are moved, one end of each overlies one of the shutters, and the other end lies in a recess formed in the plate A; these ends gear with one another as shown; F are the pins on which the levers turn. In each lever is a slot E' into which a pin D' on one of the shutters enters.

In one of the levers is also a slot E'', into which enters a crank pin G', carried by a disc G'' fixed on a spindle G; this spindle passes through the cover-plate C of the casing, and can be revolved by a spring in the following manner.

A bush H is slipped loosely on to the spindle, it has a tooth H' on its exterior for the inner end of a long coiled spring I to hold on to. The outer end of this spring is secured to the side of a cylindrical casing N, within which the spring is enclosed, and which is fixed to the exterior of the cover plate C. On the bush H is a disc H'', which has a pin H''' projecting from it. This pin passes through a slot K' in a disc K, which is placed on to the spindle and fits to it, so that spindle and disc turn together.

Outside the disc K is another disc L, which can turn loosely around the spindle; this disc has a small hole L' formed through it, into which the end of the pin H''' enters; so that by turning the disc the bush H can be turned and the coil spring wound up for a further half-turn, or more or less, as far as the slot K' will allow of the pin H''' being moved.

The discs K and L can then be clamped together by the screw-nut M screwed on to the end of the spindle, and in this way the force with which the spring tends to turn the spindle G can be regulated. The plate which carries the cylindrical casing N has a projection N' standing out from its inner side, which serves as a stop for the crank pin G' on the spindle G to come against, when the spindle has been caused to make approximately a complete turn in one or other direction, and against whichever side of the stop the crank pin may be resting the shutters will be closed.

The disc L has a roughened rim around it so that it can be turned by hand. The disc K has ratchet teeth formed around it so that it may be retained by a pawl, O, in whatever position it may be turned into.

To set the mechanism into a state ready for use, the disc L has approximately a complete turn given to it by hand, so as to cause the crank pin G' to be carried round from one side of the stop N' to the other, and the spindle is prevented by the pawl O from being turned back again by the spring.

As this is being done, the spring is wound up, the shutters also first open and again close, but this is immaterial, as the dark-slide in front of the plate would not then have been withdrawn. The shutters are then in readiness for being used, and when the dark-slide has been withdrawn from in front of the plate, can at any time be made to open and again close by a finger being pressed upon the tail end of the pawl O, and so releasing this pawl from the ratchet teeth on the disc K, and allowing the spindle to be turned by the coiled spring.

We will now describe the arrangement of the mechanism shown at figures 7, 8, 9, and 10.

Figure 7 is a side elevation of a camera with the shutter mechanism fitted to it. Figure 8 is a front view of the slide which carries the lens and shutter mechanism. Figure 9 is a similar view with the lens and front plate of the slide removed, and figure 10 is a section taken through the casing which contains the spring used for opening and closing the shutters.

The parts which are similar to those shown in figures 1 to 6 are marked with the same letters of reference as in those figures.

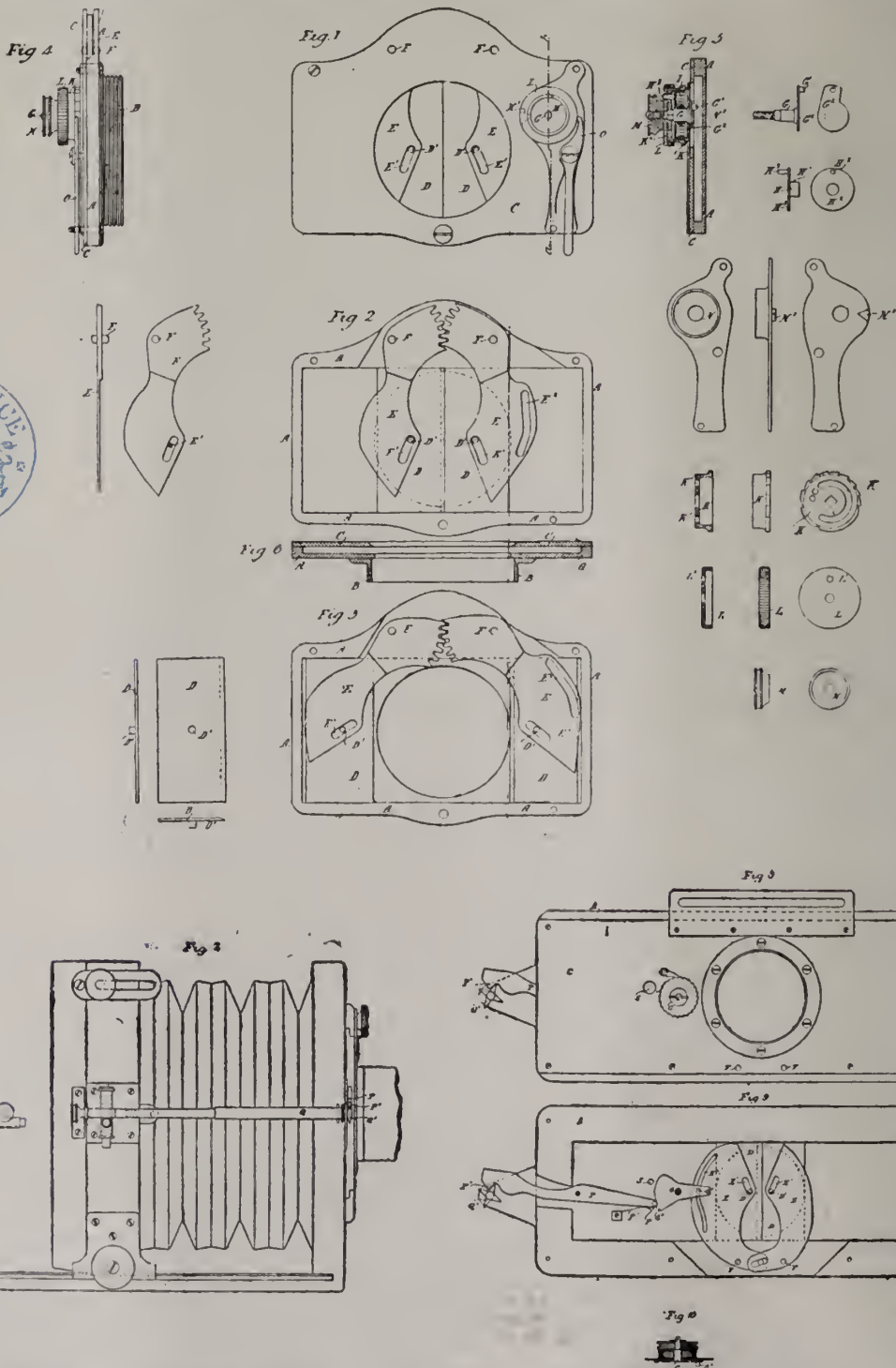
A is the back plate of the slide which contains the shutter mechanism; C is the front or cover plate which carries the lens tube in the same way as the lens tube has been carried by the



ordinary front slide of the camera; D are the shutters, E the levers which move them, F the pins on which the levers turn. The levers are geared together by a pin on one entering a slot in the other, G<sup>1</sup> is a crank pin on a spindle G entering a slot E<sup>2</sup> in

one of the levers, G<sup>x</sup> is a projection on the same spindle which abuts against a lever stop P.

A tooth P<sup>x</sup> on the opposite end of the lever P is by a spring P<sup>1</sup> kept pressed against the notched circumference of a small



wheel Q<sup>1</sup> on the forward end of a telescopic spindle Q. The rear end of the spindle is carried as shown by a universal joint attached to the rear end of the casing of the camera, and on the rear end of the spindle is a milled head by which it can be turned.

When the spindle is turned one or other of the teeth or projections of the small wheel Q<sup>1</sup> act against the tooth P<sup>x</sup>, on the end of the lever, and move the opposite end of the lever out of the path of the projection G<sup>x</sup>, on the spindle G; this liberates the spindle G, and allows it to be turned by the coiled spring.

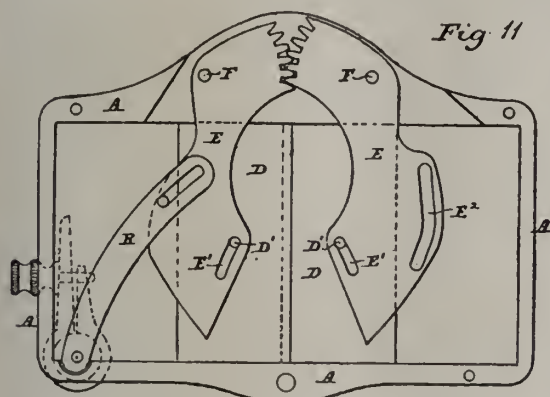


Immediately that the tooth of the wheel  $Q^1$  has been moved beyond the tooth  $P^1$ , the lever  $P$  is brought back to its former position by the spring  $P^1$ , and its end again comes into the path of the projection  $G^1$ , and again arrests the spindle  $G$ , when it has made one complete revolution.

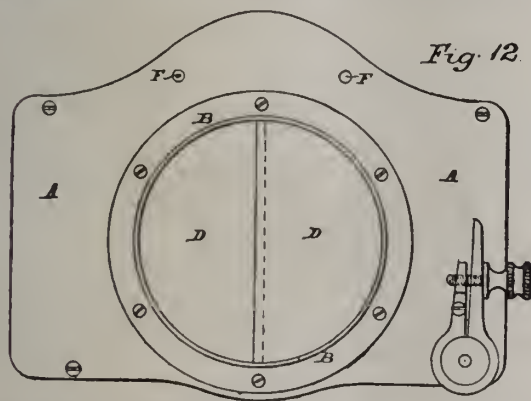
Each time that the mechanism is to be used the spring is wound up by giving one complete turn to the cylindrical casing within which the spring is contained, and the casing is retained by a pawl engaging with ratchet teeth formed around its circumference.

When focussing, the shutters can be held open by placing a pin into a hole  $S$ , so that it shall stop the spindle  $G$  when it has made half a revolution.

The speed with which the shutters are made to open or close as above described we prefer to regulate by adjusting the extent to which the spring is wound up; it may, however, be regulated



by applying more or less friction to impede their movement. This may be effected by applying a friction band which, by a screw, can be tightened up more or less around the exterior of the discs on the spindle  $G$  of apparatus similar to that shown at figures 1 to 6. Or one of the levers  $E$  of such apparatus may



have a pin projecting from it to enter a slot in a lever arm  $R$ , and a friction clip or band made to embrace the axis of this lever as shown at figures 11 and 12.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

1. Constructing so called instantaneous photographic shutters of two plates meeting in a line, which passes across the centre of the lens, and which are capable of being moved in a straight path towards or away from one another, and are so coupled together that when one is moved in one direction, the other is moved in the opposite direction.

2. Giving a to-and-fro motion to the plates by a crank pin on an axis turned by a spring, and which, when allowed to turn, makes one complete revolution, or approximately so.

3. Constructing so-called instantaneous photographic shutters of two plates, moveable towards or away from one another in a straight path by levers coupled together, both turn together,

and one moved to and fro by a crank pin on an axis, which can be made to make one complete revolution, or approximately so

4. The construction of instantaneous photographic shutter mechanism, substantially as hereinbefore described with reference to figures 1 to 6.

5. The construction of instantaneous photographic shutter mechanism, substantially as hereinbefore described with reference to figures 7 to 10.

Patents stated in the Official Journal to have become Void by Non-payment of Duty. Non-payment of Fourth Year's Fee.

8,566 of 1884. G. W. MORGAN.—Photography.

Non-payment of Tenth Year's Fee.

2,264 of 1878. H. BOGAERTS.—Reproduction of Oil Paintings.

Patents Granted in America.

338,712. HILARIUS PATTBURG, Jersey City, N.J., for "Frame for Photographs, Pictures, &c."—Filed Nov. 15, 1887. Serial No. 255,189. (No model.)

Claim.—1. The frame  $A$ , having an opening  $a$ , combined with the back board  $B$ , and the glass  $b$ , carried by said back board, and with a picture-holder on said back board and behind said



glass, whereby the picture and glass may be carried by the back board wholly independent of the frame, substantially as described.

2. The combination of the frame  $A$ , having an opening  $a$ , back board  $B$ , having cleats  $f$ , and recesses in said cleats for the reception of a picture, whereby the picture may be carried by the back board and independent of the frame, substantially as described.

3. The combination of the open frame  $A$ , hinged back board  $B$ , having recessed cleats  $f$ , and glass  $b$ , held on said cleats in front of the picture-recesses of said cleats, substantially as described.

## Correspondence.

### PHOTOGRAPHIC GRIEVANCES IN CANADA.

DEAR SIR,—May I trouble you with a few lines—final, as far as I am concerned—in answer to Messrs. Notman and Son's reply to my letter on the above subject?

Does it not seem poor logic for Messrs. Notman to imply that my connection with the Britannia Works Company invalidates certain facts which I have given—facts which I can prove, or any photographer in Canada not interested in the Canadian plate will readily endorse? Again I maintain that the Canadian Stanley and the United States Stanley are not one and the same as regards character, speed, and quality; and any one, not prejudiced, who has used them both will maintain the same thing.

And then, comparing them with the speed of Ilford's. This is really too funny. However, I suppose that Messrs. Notman have never tested the relative speeds of Ilford and their own native brand: and why should they? They do not profess to be photographic experts, like myself, and

"Where ignorance is bliss,  
'Tis folly to be wise."

I have already stated the general relative speeds of Canadian Stanley and Ilford's, and that the special "Rapids" of the latter brand are about six times faster than the former. This I have proved.

The next paragraph contains a quotation from my letter, and criticism thereon; but as the quotation is partial and one-sided, I pass this over without comment.

It seems a pity that Messrs. Notman should take the trouble to work out calculations, and then quietly to confess that they have had no data to go upon, and then de-



liberately to accuse me of wrong statement, when I have all the data at my service. Must I again affirm that the brand of Ilford's practically used in Canada pays as nearly as possible 90 per cent. duty?

I may state *en passant* that my visit to Canada had not for object the sale of Ilford plates. Strange that Messrs. Notman should know my business better than myself.

In conclusion, I have no intention of withdrawing any of the facts I have stated in my previous letter—facts which, as I have said, I can prove, and which, moreover, Messrs. Notman must also allow, unless their sense of right and wrong is entirely warped by self-interest in the matter.

J. J. ACWORTH, F.I.C., F.C.S.

#### DEBENHAM'S ARTICLES ON RETOUCHING.

DEAR SIR,—I am glad to see that the subject of "Retouching" is about to be dealt with in your paper in a thoroughly practical way by one whose experience cannot be questioned. The necessity for such articles shows that even in these advanced times of dry plate portraiture there are many photographers who, like myself, are (comparatively speaking) self-taught, or that they know nothing whatever about the intricacies of this fascinating and most important branch of their business, but are content to place their negatives in the professional retoucher's hands, and thus place themselves at his mercy as to whether the resulting print will please his customer or not; whereas, by careful consideration and resolute perseverance, any portrait photographer who has any artistic taste could overcome the majority of difficulties attending retouching. I hold it as absolutely essential that all portrait photographers who pose as professionals should have artistic ability, otherwise I think they do and always will find eventually they have mistaken their vocation. In conclusion, may I ask Mr. Debenham to deal with the subject of retouching mediums as exhaustively as his generosity will allow? There are so many different mediums in the market, and each is the best according to each maker's opinion, that I think it is possible, with a hint or two from the esteemed writer, to make for ourselves a basis, in the shape of a medium whereon to build, without in the least way questioning the foundation. Apologising for occupying so much of your valuable space,—I am, yours faithfully,

Sidecup.

S. B. McCLELLAN.

### Proceedings of Societies.

#### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

At the monthly technical meeting of this Society, held at the rooms in Pall Mall East, on Tuesday evening, the 18th inst., the chair was taken by T. SEBASTIAN DAVIS.

The ASSISTANT-SECRETARY handed round some negatives and prints, which had been forwarded in order that the opinion of the members might be obtained as to the cause of certain spots which appeared thereon. On the negatives the spots were so faint that some of the members failed to make them out by the gas light of the room; they were, however, distinguished by others as of a reddish colour, and as having a mottled appearance. On the prints the spots were very discernible as light patches.

W. E. DEBENHAM had seen on some plates spots of a somewhat similar character, that had arisen from two distinct causes. In the one case they indicated a certain amount of deposit or dirt on the glass used for coating with the sensitive emulsion; in the other case they were attributable to imperfect fixation, due to old or weak hyposulphite fixing bath, or to an insufficient stay in such bath. It was not sufficient in a weak fixing bath to leave the plate in merely so long as was required in order for it to appear fixed to the eye; it should stay in for a certain time longer than that, otherwise a silver compound might be left in places where the emulsion was thicker coated, or where there was an accumulation of silver bromide. This silver compound, although colourless and trans-

parent, and therefore not visible at the time, changed after a while to a red colour, similar to that seen in the present negatives, and then caused spots to show in the prints.

FRIESE GREENE was of opinion that the spots were due to the use of an old hypo bath.

The ASSISTANT-SECRETARY said that he was informed that the hypo bath was used fresh every day.

W. E. DEBENHAM enquired whether the spots showed at once when the plate was examined after fixation, or whether they only appeared after a time.

The ASSISTANT-SECRETARY replied that they did not show in the first instance, but only came on by degrees.

A. COWAN considered that that reply settled the question, and that the spots were certainly due to imperfect fixation.

W. BEDFORD enquired whether a flat dish was used for the purpose of containing the fixing bath; and being answered in the affirmative, said that there were probably particles of dirt or extraneous matter in the solution, which settled on the plates in the places where the spots subsequently appeared, and caused the fixing action in those places to be more slow and imperfect than on the rest of the negative.

A. COWAN said that he had been experimenting with hydrokinone as a developer for chloride plates, and found that it answered exceedingly well. He exhibited a frame of transparencies developed on slow chloride plates, with hydrokinone in combination with various alkaline carbonates. It was necessary to use a small quantity of bromide in the solution, otherwise the plate fogged all over; but a very small quantity, one-tenth of a grain to the ounce, proved sufficient, and the picture then came out very well, of good tone, and with perfectly clear shadows. The development was exceedingly rapid—the longest time taken by any of the specimens produced was half a minute. There was a slightly different character in the tones produced by the different alkalis. Ammonia gave a very rich colour when the picture was viewed as a transparency, but owing to a peculiar greenish tint by reflected light, which was imparted to the image by this alkali, it would not be suitable for pictures on opal or paper to be looked at otherwise than as transparencies. Carbonate of soda answered very well as the alkali. He had used the ordinary washing soda with success. Two grains of hydrokinone, ten to forty grains washing soda, and one-tenth of a grain of bromide of potassium to the ounce of water, formed the solution that he had employed. With ammonia the image developed very red, but on drying took a more neutral tint. The weaker the soda, the redder the image appeared. The pictures shown had all received the same exposure, the variety of tint resulting only from differences in the developer. The plates were slow chloride made expressly for transparency printing, and had received an exposure under a negative of five seconds to diffused daylight. One of the prints was developed with alkaline pyro. There seemed to have been an idea prevalent for a long time that chloride plates were not amenable to pyrogallol development. He would like to know how this idea became so general, and who was responsible for it in the first instance.

The CHAIRMAN remarked that there was a slight tinge of red in the transparent portion of the plate.

A. COWAN replied that that could be entirely removed by immersion in a dilute acid bath. The slow chloride plate gave an image with shadows that were, except for what colour belonged to the gelatine itself, absolutely clear.

FRIESE GREENE considered that some deposit on the shadows of a negative was desirable, and produced a better result in the print.

The CHAIRMAN said that many amateurs complained that they could not obtain clear places on their plates where there was no image; that if a plate was developed which had not been exposed in the camera at all, there was still a certain amount of deposit upon it.

A. COWAN said that a plate which gave fog when there was no image upon it, would yet yield a negative having perfectly clear shadows.

W. H. HARRISON concurred with this statement, and added that when there was no image to be developed, the developer had nothing else to do, and so employed its energy in producing fog.

The CHAIRMAN had succeeded in preparing an emulsion yielding perfectly clean shadows by adding hydrochloric acid to bromide emulsion at the time of mixing, but in order completely to accomplish this result, he had had to add so much acid as to make the emulsion three or four times less sensitive than it would otherwise have been.



W. E. DEBENHAM could not concur with an opinion that had been expressed, that it was an advantage to have a certain amount of fog in the shadows of a gelatine negative. He thought that in order to obtain the highest quality of negative, one in which the range of gradation should be the most extended, the plate should be capable of leaving the parts unacted upon by light as clear as possible. When there was any notable amount of fog in the shadows, he had found that the gradation at the other end of the scale, in the high lights, suffered. When these were developed with sufficient intensity to bear their proper relation to foggy shadows, the highest lights, and those of the next grade, run together, and so the negative lost the crispness and sparkle which was evident in nature, and gave so much beauty to a photograph.

A. COWAN was of the same opinion—the density required for a foggy negative flattened the lights.

W. BEDFORD expressed his views as being similar to those of the two preceding speakers, whilst T. Samuels appeared to coincide with F. Green.

The CHAIRMAN said that he had found he got a better quality of negative by immersing the plate before development in a two per cent. solution of tannic acid. The idea was much the same as to flood with pyro before adding the alkali.

W. E. DEBENHAM enquired whether the tannic acid solution appeared to slow the exposure.

The CHAIRMAN thought not.

W. BEDFORD thought that the best gradation was to be obtained with the most rapid plates, and that the deficiencies generally attributed to the latter were due to optical causes, halation particularly.

T. SAMUELS wished that there were some means of controlling development over different parts of the gelatine negative, so as to keep back the sky and bring out dark foliage, &c. He used to develop special portions of collodion negatives, as they were held in the hands, but did not see how it could be done with gelatine plates, which were developed in dishes.

A. COWAN replied that Payne Jennings had stated that it was his practice to develop gelatine negatives by immersion in the dish until the sky was out. The plate was then washed, and development continued with a brush on the rest of the plate.

W. BEDFORD said that from the scientific point of view it was desirable to get the whole image out with one application. He did not despair of being eventually able to do this by the aid of the orthochromatic principle, and by further developments in photography.

W. E. DEBENHAM said that that was the result we had to try for. All such contrivances as partial development, sloping diaphragms, as introduced by the late T. Sutton, shutters for giving longer exposure to the foreground than the sky, were necessarily imperfect. If by the help of any of these plans the sky was made to print with more transparency than it would otherwise have, one of two things must result: either the line of demarcation was sudden, when it would be very unnatural and inartistic; or it was gradual, when in such objects as a tree projecting upon the sky, either the sky near the tree must be more vigorous than the rest of the sky, or the deposit on the tree itself at its edges would be thin.

The CHAIRMAN thought it satisfactory to recognise that we had something to look forward to, and the direction in which it was to be sought.

F. GREENE produced some photographs which he had made of the electric arc spectrum, and which were curious as giving a decided image of the yellow, whilst the green was not indicated. There was a strong impression in the blue, violet, and ultra-violet. The plates had been coated upon ordinary gelatinobromide of silver plates, with collodion-chloride emulsion containing excess of nitrate of silver, and printed right out without development. He had also found green light better for developing by than yellow, especially for orthochromatic work.

W. BEDFORD remarked that it was now generally admitted that far more colour sensitiveness was obtained by the use of dyes than it was possible to obtain by any molecular condition of the silver bromide.

The meeting then adjourned.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The ordinary weekly meeting was held on the 13th inst., W. PRESTWICH in the chair.

Professor STEBBING, referring to the Photographic Congress to

be held in Paris next year under the auspices of the French Photographic Society, said he hoped the English photographic societies would be well represented on that occasion.

A. COWAN had, during the week, tried the Pizzighelli printing-out process. He handed round two prints as specimens. He had found it slow, but he considered it had a great future before it.

W. F. EDWARDS had also tried this process, but was not satisfied with the results he had obtained. He passed round a series of prints by the Pizzighelli process and a series of platinotype prints side by side taken from the same negatives, the latter showing decidedly to the best advantage.

W. H. HARRISON had for the past three years off and on been engaged in experimenting with similar processes. The chief difficulty seemed to be to prevent the deep shadows from being blocked.

A. HADDON thought that justice was not done to the printing-out process by the specimens shown by Mr. Edwards. This might be due to a bad sample of paper.

Professor STEBBING said platinotype was at one time used in Paris. It, however, was not much cared for. The cold process was now used by one or two houses, the work produced being very good.

L. MEDLAND showed some views of the recent cattle fair held at Barnet.

A special meeting of the members was then held to appoint a successor to J. J. Briginshaw, who had been compelled, from the very great demands upon his time in other directions, to resign his post as hon. secretary.

F. A. BRIDGE having expressed his willingness to undertake the duties, he was unanimously elected hon. secretary of the Association.

W. H. HARRISON proposed in complimentary terms a very hearty vote of thanks to the late hon. secretary for the services he had rendered the Society, and the amount of energy he had brought to bear in connection with his duties.

This was seconded by the whole of the members present, and carried unanimously.

J. J. BRIGINSHAW, in thanking the members for the very cordial vote of thanks they had passed to him, referred to the several combined causes which had left him no alternative but to resign, a step he had taken with considerable reluctance and regret. The deep interest he had always taken in the progress and welfare of the Society would still remain unabated, and it would be his desire to continue to work for the Association with the same earnest effort that had been his chief care during the time he had been honoured with the confidence of the members.

#### BIRKENHEAD PHOTOGRAPHIC ASSOCIATION.

The ordinary meeting of the above was held in the Free Public Library, Hamilton Street, on the 13th inst., President J. H. DAY in the chair.

John Wignall was elected a member.

C. KEMMISH exhibited a somewhat new form of detective camera, entitled the "Bifacial." The maker adopts Sutton's plan of a ground glass focussing screen, the size of the plate, in its top, on which the lens, by the aid of a mirror, shows the view at the moment of taking the picture; the act of making the exposure removes the mirror, which then covers the focussing glass, thus making the camera perfectly light-tight.

J. E. THORNTON exhibited and explained his two cameras, the Tourist and the Cyclum, also the Pickard exposure meter, the ingenuity displayed in the construction of the various articles exciting frequent applause.

The SECRETARY exhibited Smith's A1 camera.

C. B. READER explained a simple and efficacious method he had of marking negatives. The matter required is written reversed on the film with ordinary office copying ink, over which, when dry, bronze powder is dusted, the whole forming characters of perfect density. The danger of using bronze powder was referred to, but any that might become detached and adhere to the print, as was pointed out, would be removed during the toning operations.

Reports from the various members working on the Wirral survey scheme were handed in, when it was found that over two hundred negatives had been secured, with promises of many more, which was thought very satisfactory, considering how much the elements have been against photography during the summer.



## Talk in the Studio.

PHOTOGRAPHY AND THE WHITECHAPEL MURDERS.—Dr. G. B. Phillips—Official Police Surgeon—called as a medical witness in reference to the murder of Annie Chapman, was asked as to the possibility of obtaining a clue to the murderer by photographing the eyes of the dead woman; but, as might have been expected, he gave no hopes of any useful result. It must be remembered that the witness in question is the surgeon who endeavoured to suppress much that he knew as to the nature of the mutilations, and it was this extraordinary action on his part which gave so much colour to the theory that the murder was really committed by some over-wrought experimental physiologist wishing to obtain living tissues from a healthy subject, for experimental use. Although we may pretty confidently say that photographs of the eyes of the murdered woman would have been useless, there can be no doubt whatever that a series of photographs of the body and of the mutilations ought to have been taken, and in the face of these it would have been far more difficult to conceal essential facts. It is to be hoped that even now the camera will be brought into requisition, especially as there are several experienced anatomists who are also competent photographers. Perhaps a carefully-made series of photographs, and the calling of such scientific experts as have distinguished themselves in the new art of abdominal surgery, might throw light on the extraordinary action of the authorities in neglecting the most obvious means of getting information or of recording facts, and also on the strange action of Dr. Phillips.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—On Tuesday, October 2nd, there will be a discussion on "Enlarging." H. M. Smith, late hon. secretary, will give a demonstration showing the capabilities of gelatino-bromide for large sizes.

THE "WORLD" ON AMATEUR PHOTOGRAPHERS AT DIEPPE.—Speaking of the race-week amusements at Dieppe, the *World* says:—"The chief amusement during that crowded moment was to see Mlle. Jane Hading, a well-known Parisian *horizontale*, take her daily bath at the *Grenouillière*, as the *petits bains mixtes* are colloquially termed. Arrayed in *maillots*, either black or sky-blue, and accompanied by a big dog, this fair lady's dip was the "sensation" of the *plage*; and when she was towed in, holding on to her dog's tail, from the deep water where she had taken her swim, she fairly "brought down the house," and caused infinite joy to the amateur photographers who infest the shingly beach at Dieppe. These amateurs of the camera resemble the typical *sapeur* inasmuch that nothing is sacred to them. No one notices the small black box which the amateur carries in his hand; he looks into it for a second, there is a slight click, and the miscreant raises his head and goes his nefarious way with a self-satisfied smirk, for has he not "taken" one of his unsuspecting fellow-creatures at a moment and in a position when he or she is least prepared to be landed to posterity? The amateur photographer is rapidly becoming one of the terrors of the beach; and soon, owing to the ministrations of him and his tribe, Burns's aspiration,

"O, wad some power the giffie gie us  
To see ourselves as ithers see us!"

will be superfluous and unnecessary. If it were not for the photographers, Dieppe *plage* is wonderfully free from the usual pests.

WELSH FUSILIERS AT HAWARDEN CASTLE.—Speaking of a gathering at Hawarden Castle, at which the band of the Welsh Fusiliers was entertained by the ex-Premier, the *Daily News* says:—"The whole party was then photographed by Mrs. Wilkinson, of Penryffordd. Mr. Gladstone conducted the bandmen over the Castle. In addition to the members of Mr. Gladstone's family, Mr. John Morley, M.P., was also present. The Fusiliers subsequently left the Castle to the lively music of the 'March of the Men of Harlech.'"

THE "DAILY NEWS" ON PHOTOGRAPHY IN CONNECTION WITH MILITARY BALLOONING.—It is contended, seemingly with great plausibility, that the reconnoitring for which captive balloons are employed might be carried on more easily and effectively by ascending in a small free balloon, and coming down by this new form of parachute, photography being, it is said, perfectly practicable both while ascending and descending. Mr. Farini affirms that on one occasion in America Mr. Baldwin made an ascent such as he made the other night from Muswell Hill, and carried with him a "gun camera." The sighting of this camera is effected after the manner in which a gun is aimed. When in

this way the object to be photographed has been put into the field, the pulling of a trigger passes a 'sensitized' paper from one small reel to another across the focus of the lens, and the picture is secured. It is said that on the occasion referred to the aeronaut brought down seven excellent photographs of the scene he had been floating over. Given a man with a sufficiently cool head and an instantaneous camera at command, let him ascend to a height of 1,500 feet or so, aim his camera, and then drop gently to earth with his instrument and his negatives. It seems clear that under some circumstances, at least, he might afford a very important contribution to our knowledge of an enemy's position and strength. Possibly it would be practicable for a cool and well-practised aeronaut to go up and come down again, taking photographs all the way or nearly so. It has been suggested that a camera may be sent up and controlled by an electric conductor from the ground, and that in this way any number of instantaneous photographs may be secured without risking anybody's neck. Major Templer, who has been repeatedly present at the ascents from Muswell Hill, as representing the Royal Engineers, is understood to be very favourably inclined to the new parachute, and as its adoption at Chatham would involve an early trial of the apparatus by himself, it is impossible to doubt the disinterestedness of the favourable report he is understood to have made."

FRY'S LIGHT-TIGHT PLATE BOX.—From Samuel Fry and Co., of Kingston and of Chandos Street, we have received for review a light-tight plate box, which presents several excellent features. The sides are of cardboard, and set an interval from each side is a thin wooden sliding slab, which serves as a buttress against any blow or fall the box may receive, and at both top and bottom there is ample protection in the way of corrugated paper. Black paper flaps under the draw-off lid effectually exclude all light when the box is closed. The grooved ends of the box are of wood, and are admirably cut. Apart from affording efficient protection against light and shock, the most important factors in determining the excellence of a plate-box are weight and price. The  $6\frac{1}{2}$  by  $4\frac{1}{2}$  box sent for notice weighs but  $8\frac{1}{2}$  ounces, and the accompanying price list shows its price to be but fivepence.

THE WOODBURY COMPANY.—It is said that T. W. Fry, so long known as being associated with the management of the Woodbury Permanent Printing Company, has resigned his position, and will retire at the end of the present month.

PHOTOGRAPHIC CLUB.—The subject for discussion on Sept. 26 will be "Print Washing." Saturday outing at Sudbury, Middlesex.

## To Correspondents.

G. M. REDAWAY.—See page 186 of the YEAR-BOOK OF PHOTOGRAPHY for 1888.

F. W. S.—It has been done.

E. C. MIDDLETON.—We do not make a rule of keeping appointments made for us by our correspondents; and had we wished ever so much to meet you, we could not have acted on an undated letter mentioning "to-morrow." In addition, you did not clearly specify the place.

A. M. I. C. E.—1. Thank you for the paper for the YEAR-BOOK. 2. The liquid contains potassium sulphate, zinc sulphate, chromic sulphate, and excess of sulphuric acid; and if allowed to stand where it can evaporate, will deposit purplish crystals of chrome alum. This, when recrystallised, may be useful to you in connection with gelatine work.

INTEGUMENTA.—1. We will post you a few as we get them. 2. New York.

G. SCARD.—Your only course is to advertise for some one who will teach you the routine of the business, and if you have some technical knowledge you may perhaps get what you require without having to pay a premium.

T. W. PARRY.—1. We are inclined to prefer face downwards. 2. We do not know the preparation you speak of, but we have little faith in "hypo-eliminators" as a substitute for thorough washing.

GLOSS.—A solution of paraffin wax in benzoline, or of white wax in benzole. Rub this on, allow to dry, and burnish in the usual way.

R. J. M.—1. Its essential constituent is a sulphantimoniate of sodium. 2. The removal is not easy, but sometimes a weak solution of potassium cyanide answers the purpose.

SULPHIDE.—1. The glass contains lead and becomes blackened by long contact with the solution. 2. A low red heat is sufficient.

NITRATE.—It was sold in London ten years ago, but we do not think you will obtain it at the present time.



# THE PHOTOGRAPHIC NEWS.

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**SCHIRM'S MAGNESIUM LIGHT APPARATUS.** PHOTOGRAPHY by artificial light received a great impetus last year from the introduction of new methods of burning magnesium powder. The leading feature in the various arrangements that were then brought forward was rapidity of combustion; so rapid, indeed, that photographs called instantaneous could be taken by the methods practised at that time. For the success of this plan of burning in a flash, in place of the older method with wire or ribbon, it is essential that the combustion shall be so rapid that the movement which the violence and suddenness of the flash naturally induces in the sitter, shall not take place until the flash of light itself is over.

Fig. 1.

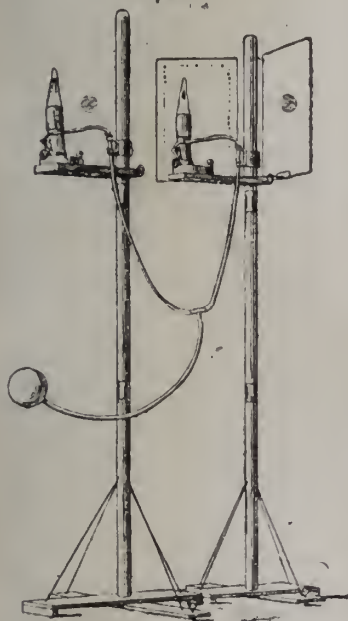


Figure 2

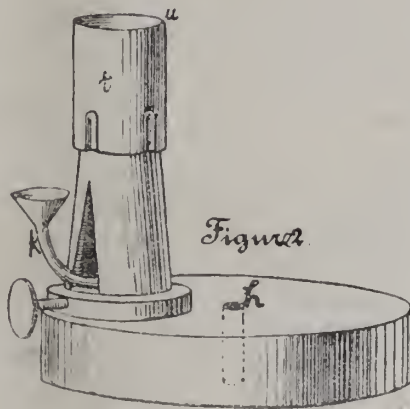
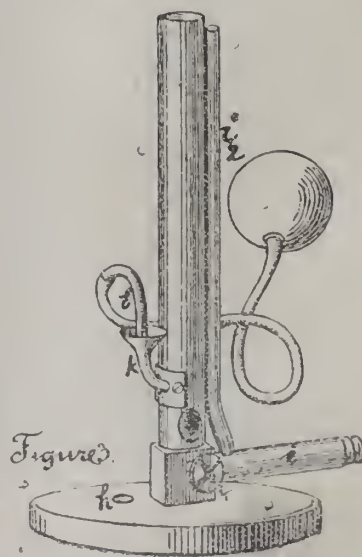


Figure 3



extent during the summer months, but with the shorter days and longer evenings now hastening upon us, the subject is likely to come again to the fore, and plans found successful last winter will again come into use, and be compared with whatever newer developments may have since been made.

In the September number of the *Photographische Correspondenz*, Dr. Eder describes an apparatus by Schirm which appears to be very successful, and although most of the individual parts may not be new to those of our readers

The idea of making use of magnesium light in the form of an instantaneous flash, in place of a slower method of combustion, is not indeed new, as it was used by Larkin nearly a quarter of a century since; but the present lower price of magnesium, the much greater sensitiveness belonging to the gelatino-bromide process as compared with collodion, and the simultaneous, or nearly simultaneous, development of various methods for ensuring rapid combustion, have all tended to confer far greater popularity upon the method of photography by magnesium light than it ever previously enjoyed. The stimulus due to all the causes enumerated, which was given to artificial light photography a year or so since, naturally lapsed in its effect to a great

who have carefully followed the progress of this branch of photography, the following extracts from Dr. Eder's description will be of interest to many who think of taking up the practice of photography by magnesium light.

In Schirm's apparatus, pure magnesium powder is blown through the flame of a spirit lamp or of a Bunsen burner, but in the direction of, and not across, the flame. Perfect combustion of the magnesium is thereby ensured, whilst on the other hand, when blown across the flame, the powder is partially unconsumed, on account of the cooling



of the flame. In the way now recommended a minimum quantity, about five centigrammes, of magnesium powder suffices for the taking of a portrait photograph.

Figure 1 shows two stands with spirit lamps and shields, fixed ready for burning the magnesium. The stands are of wood, and on a movable shelf on each is a spirit lamp of special form (see also fig. 2). Through both flames a certain quantity of magnesium powder can be blown simultaneously by means of the India-rubber ball shown in drawing. The illumination is instantaneous. Before each flame a sheet of tissue paper may be stretched upon a frame as is shown attached to one of the stands in fig. 1. An opaque card is used to shield the lens from the direct rays of light proceeding from the burning magnesium. This cardboard, on the side facing the flame and the sitter, is covered with tinfoil or silver paper, by which the light upon the subject is increased.

One burner is, or two may be, used at a distance of from forty to sixty inches from the sitter to illuminate him on the side where the strongest light falls, and at about a height of one foot above that of the head. On the other side the burner the use of which is to lighten up the shadows is placed about eighty inches from the sitter. If no tissue paper is used in front of the burner on the light side, an effect of lighting resembling that of feeble sunshine results. With the tissue screen the light is like that of soft daylight.

The light which has to illuminate the shaded side of the subject is reduced as much as necessary by being placed at a greater distance from the sitter, by being screened, or by the use of a smaller quantity of magnesium powder. The light should not be arranged too much in front of the sitter. Care must be taken that there is no sharp bend in the rubber tubing connecting the pneumatic ball with the lamps.

The spirit lamp of Schirm's apparatus is represented in fig. 2. The vessel at the bottom of the lamp is filled with strong spirit, and the wick, being lighted, is set to such a height that the flame reaches about two inches higher than the edge of the chimney. The tube of the funnel K is then placed sideways in the flame, and some magnesium powder on the point of a small knife is introduced into the funnel. Into the neck of the funnel a tube is fitted that is connected with the pneumatic ball. The opening shown serves for making the lamp fast by means of a nut and screw to the stand on which it is placed.

When gas is used, the intake tube of the burner (fig. 3) is connected with the supply, and the flame is lighted. The screw *i*, serves to regulate the amount of gas that is allowed to pass. After filling the tube of the funnel from a small measure of a specified size, the bent tube L is inserted in the neck of the funnel, into which it fits tightly, and the apparatus is ready for use.

The small tube *i*, serves to re-light the gas when it is blown out by the force of the stream of magnesium and air through it.

The cap of the lens being removed, the pneumatic ball is pressed at the moment that is deemed best, and the subject is exposed to the instantaneous flash of the burning magnesium.

When a second burner is employed for lighting up the shady side, the rubber tubes attached to the two burners are fixed to the arms of one common T-piece, and the tube leading to the pneumatic ball being snapped on to the stem of the T-piece, the illumination of the two burners is quite simultaneous. The arrangement and regulation of the light is in the manner described so easy that the pictures obtained by this means do not yield, says Dr. Eder, to those taken by daylight.

The apparatus has been used with the greatest success at the Imperial Institute for Instruction and Experiment in Photography in Vienna. The small amount of magnesium required (about three-quarters of a grain) for a portrait, indicates that much more perfect combustion and illumination is obtained than we have been accustomed to,

and, according to Dr. Eder, there is in consequence no noticeable amount of fumes given off. If this prove to be the case in studios or rooms of ordinary size, it will indeed be a departure that should enormously increase the sphere of usefulness of photography by magnesium light.

## PHOTOGRAPHING THE GREAT ERUPTION AT MOUNT BANDAI, JAPAN.

BY W. K. BURTON.

I IMAGINE that some account of the terrible eruption that took place in this country about three weeks ago (on the 15th of July) must have reached England, but I very much doubt if any description that can convey the faintest idea of the nature of the calamity has been sent, for even here, only about 150 miles from the scene of disaster, it is only within the last few days that the newspapers have contained anything that could be called a real description of the state of affairs. I hope, therefore, that the brief description I now give may be of interest to your readers.

It is now just ten days since I was dispatched by the University to join a party that had gone to the mountain to investigate matters. The object, in my case, was to take photographs of anything that might be of scientific interest. I had a student of the College of Engineering with me to act as assistant interpreter.

I shall not trouble your readers with any description of the rather troublesome two days' journey to the place nearest the mountain where it was possible to get house room, nor with the names of a number of villages and so forth which they would probably not even be able to pronounce, and which could not, in any case, be of interest to them. To those who know the country, it will be sufficient to be told that Mount Bandai\* is immediately north of Lake Inawashiro, which, again, is about 150 miles north of Tokio, and about twenty miles west of the new railway line between the last mentioned place and Sendai.

For many days the most contradictory reports as to the number that had been actually killed by the eruption had been circulated; it is now pretty certain that 500 is an approximately correct figure.

The mountain was, before the eruption, a triple-peaked one, the height about 5,000 feet.

It was naturally interesting, although by no means easy, to get from the survivors some account of what took place, or seemed to them to take place, at the moment of the eruption. The following is collected from various sources. There was a noise that it is impossible to describe (according to most). One man likened it to volleys from a thousand cannon often repeated, then the ground shook and moved up and down, so that it was impossible longer to stand, and all had to go down on hands and knees. There followed, in most places, total darkness, and in some a wind that swept down the houses, and brought with it scalding hot, wet dust. The darkness cleared off in about two hours, and showed the whole of the surrounding country changed, the valleys filled up with debris, villages buried so that no trace of them could be seen, and whole forests swept away. Most could give no description of anything beyond the noise and the shaking of the earth. Their minds seemed to have become blank with terror after this. There was one man—and, I should think, one only—who remained quite cool during the whole affair, and was able to give a most consistent account of what he had seen. He was high up on a mountain side to the windward of the central peak of Mount Bandai when the eruption took place. When he saw it he concluded that he had been bewitched by foxes,† and that his best course was to keep quite calm and col-

\* The various terminations "San, Sama, and No-Yama," may all be translated "Mount."

† The commonest form of bewitchment in Japan is that by foxes. The victim is afflicted with all sorts of delusions, mistaking his friends for enemies and so forth, and the best way in which to prevail against the enemy is to remain quite calm and inactive.



lected. He therefore lighted his pipe, and smoked calmly whilst he looked down and saw his native village overwhelmed. He heard the noise and felt the shaking, like others, and then he saw the greater part of Bandai thrown bodily upwards and descend on the valleys below. At the same time streaks of fire issued from the mountain in all directions, and a vast cloud of steam filled the air. In the steam he saw "white things apparently moving rapidly up and down."

After a pretty thorough examination of the district, the following is the general conclusion as to what took place. In the first place, the eruption was not "volcanic" at all, in the strict sense of the word. There was no fire,\* it was simply a steam explosion of such extent as to blow a great mountain to atoms. It is difficult to estimate the pressure at anything below some tons to the square inch. Hot springs had issued from the mountain at various places from time immemorial, showing the contact of water with something hot; but what may have been the factor that actually decided the explosion it is impossible even to guess. The explosion blew up the whole central portion of the mountain, including the central peak; but the direction was not vertical, but probably at an angle of somewhere about 45 degrees, so that the debris has fallen all on one side of the mountain, filling up the valleys, and overwhelming an area of country probably underestimated at forty square miles, and over-estimated at seventy square miles. The depth to which the land is covered probably varies from ten feet to several hundred feet, or, at places, even to a thousand feet. A feature that was remarkable to me was the extreme abruptness of the outline of deposit. There was no falling off to nothing, as I should have expected, but, coming towards the deposit, one stepped from the natural ground at once into a thick deposit of a mixture of stiff mud and boulders. The darkness was, without doubt, produced by a vast quantity of dust that was carried into the air by the steam of the explosion. It must have kept falling slowly for some hours, as all the country in the direction of the wind at the time of the eruption was found to be covered with it to a depth varying from nothing measurable to about six inches. At some places, at any rate, it fell so hot as to scald those whom it touched, and some of the killed are supposed to have been smothered by it.

The mud has, in some cases, flowed down valleys reaching a distance of six to eight miles from the crater, and, of course, sweeping everything before it. In such cases it has consolidated, leaving the valleys filled up. The course of a river has been blocked, and a lake is forming behind the impediment.

I took with me a 10 by 12 camera, a battery of lenses, and two and a half dozen plates. I may say at once that I made sixteen exposures with the following results. Two of the plates were broken on the way home by the manner in which my portmanteau was treated by the railway officials (as, however, the break is in each case quite a clean one, these plates are still available for any scientific purposes). One plate was utterly bad. By the best luck in the world, it was the only one that I had duplicated. The others were all as good as could be expected, seeing that most of the subjects were of a very difficult nature.

We arrived at our destination early one afternoon, and besides the remainder of that afternoon, we spent three days investigating and photographing. A brief account of our work may be of interest.

On the afternoon of our arrival we made our way to the nearest village up the valley from that in which we were staying. At this village, or rather in the middle of it, a mud river had just stopped, so that one half of the village was buried, the other half was unharmed. When we first reached this village, and during the whole of my

stay in the neighbourhood, the people, young and old, male and female, were digging to excavate the buried part of the village. They found several corpses during the time that I was there—several every day, indeed, I think—but I did not see these. I heard quite enough about them to take away all desire to see them. It was ten days after the eruption, and the weather had been very hot. I do not know whether it is a thing characteristic of the Japanese people, but it made a powerful impression on me, that they were all very merry over their ghastly work. I made one exposure at this place to show the extreme abruptness of the end of the mud river, one house being actually half crushed, whilst the other half remained standing.

The next day we were stirring at three o'clock to make our way to the crater. We ascended what may be called the back of the mountain; that is to say, the side other than that towards which all the debris had been blown. After about four hours of walking, we stood on the upper edge of the crater, and it was then that, for the first time, some idea of the vastness of what had befallen came to me. We stood on the brink of a great hole, above which, before, had been the mountain peak. It was open on the side opposite to us, the walls round the rest of it nearly vertical, and varying in height from about a hundred to about a thousand feet. From the bottom of this great opening there were issuing clouds of steam, and it was only as those blew to one side or the other that a faint view of the country, utterly devastated to almost the greatest distance it was possible to see, could be got. It was a rugged wilderness such as I had never seen, and could have formed no conception of. It is most difficult to write anything that can give even the barest idea of the nature of the scene. All must have seen a stone quarry on the side of a hill. Let the reader imagine such a quarry several square miles in extent; let him imagine himself standing on the upper edge, looking down into its depths, and looking out of the far side of it over fifty square miles or so of land, over which has been wildly scattered all that has been taken out of the quarry. That may give him some idea of what we found ourselves gazing on, but for the absence of the steam, which was the most remarkable feature of the extraordinary scene. I append a rough hand-sketch (No. 1) of a cross section of the mountain ap-



No. 1.

proximately as I imagine it to have been, and as it is. The dotted portion is that that has been blown away. I made a photograph of the general scene, looking down, which, considering the great difficulty, is, I think very fairly good. A copy is enclosed (No. 2).

Almost where we stood there were several black puddles, from which there came bubbling a sulphurous steam, which is just perceptible in the photograph. I believe that these were the same that had supplied a hot spring village (a health resort), of which there remained now only one ruined hut. Every one of the health seekers had perished, and no trace had been found of them. I photographed the wretched hut, but the plate was one of those that were broken.

We made our way down to the place where the steam was to be seen, by a by no means easy path, passing down

\* The fire mentioned by our bewitched friend I believe to have been produced simply by the rending of the rocks, or possibly to have been of the nature of lightning. It is improbable that so vast a force as that which could throw a mountain into the air could have been exerted without exciting some electrical phenomena.



a portion of the wall of the crater that had fallen in. At about a mile from where the steam was issuing, we began to hear a noise, at first faint, then like the breaking of waves on the shore, and, when we came nearer, more like the roaring sound produced by a great water-fall than anything else. When we got to windward of the steam, we



No. 2.

found that the sound was produced by steam issuing at high pressure from fissures in the rock, steam rising thousands of feet till it joined the clouds above—the blowing off of the largest safety valve, I suppose, that was ever seen! We went as near to the issuing steam as we dared, treading on hot ground—ground so hot a little below the surface, that if a stick were driven a foot or so into it and withdrawn, the iron point could not be touched by the hand.

I made, altogether, about half-a-dozen exposures of the issuing steam in the crater on this day and on that following. All came out well, but it is difficult to say whether or not



No. 3. 1

they will give, to one who has not seen the thing, any real idea of what it was like. I enclose prints from two of the negatives (Nos. 3 and 4.)

In exposing on this and similar subjects, where the foreground was dark, whilst the upper part of the picture represented the most brilliantly lighted clouds, the difficulty was, of course, to get anything out in the foreground without having the clouds hopelessly over-exposed. I had foreseen this difficulty, and had therefore taken slow plates with me. Using, generally, stop No. 64, I gave the foregrounds exposures of about five seconds, and the clouds of the shortest time that I was able to give by hand.

We made our way home that day across the devastated ground. Although the explosion may be said to have

driven the debris generally in one direction, yet there remains a broad streak of land between two main fields of devastation. There are several villages on this land, and these have been completely blown down by the wind that followed the explosion. The houses lie, for the most part, as flat as pancakes, and there are to be seen uprooted trees



No. 4.

in all directions. We passed these villages on our way home, but my plates were exhausted. I therefore left the photographing of them till next day, when we made our way to the crater by the road of our return on the day that I have been writing of. I send a print of one of the two negatives that I took of these villages (No. 5.)



No. 5.

When we arrived at the crater I was astonished to find its appearance quite changed since the day before. The position of the steam outlets was several hundred yards from where it had been; the very place where we had stood, as near the steam jets as we had dared to go, had been altogether blown up. There must have been a minor eruption during the twenty-four hours or so that we had been away. I noticed, moreover, that the wall of the



crater had fallen in at more than one place. The ground near the main steam jet being hard, and there being a constant induced current of cold air towards it, we were able to go quite close to the opening. It was a rift in the rock of, probably, about 10 square feet area, from which was issuing, with a bellowing that was deafening, steam that seemed as if it might supply all the steam engines in the world. On our way back I photographed a part of the crater, perhaps about a mile or rather less from the issuing steam, to show the way in which the boulders are piled one on another. I send a print from the negative (No. 6.)



No. 6.

The next and last day of our work was spent in making our way to the edge of the devastated district opposite to the mountain, so as to face the latter, and to photograph its general aspect. We were probably six or seven miles from the issuing steam. On our way home we very nearly stuck entirely in crossing a mud river that formed a tributary to the main field of flow of mud. The surface had dried in the sun, and gave a deceptive appearance of firmness, but we very soon found ourselves sinking in soft mud half-way up the thighs. The distance across the river was perhaps about half a mile. It took us an hour and a quarter of certainly the very most fatiguing walking that I have ever known to get to the far side, and we were glad enough to get there at all. My last exposure made on this day was one of the mud river. It is a good enough photograph, but whereas in fact the outline of the river is clearly marked by the difference in colour of mud and forest or grass, the difference is but slight in the print.

We had been walking for from twelve to fourteen hours over very rough ground and under a burning sun, on each of the three days, and were glad enough to get away next day.

The impression made on me was one likely to be lasting. The scene would be one more than interesting, were it possible to consider it apart altogether from the loss of human life; but the fact that as we walked over the wilderness of mud, rocks, and boulders, we were walking over the graves not of individuals only, but of whole villages, out of which every spark of life must have been crushed in a single second, and of which no trace will ever again be seen by any human eye, made the whole thing more terrible than interesting.

#### THE MAGNESIUM LIGHT AND DETECTIVE CAMERA FOR OBTAINING EVIDENCE.

The *New York Press* of September 12th has the following:—

Augustus Cook, an artist, living on East Eleventh Street, has brought suit for divorce upon evidence furnished by a magnesium camera. The delicate instrument was carried by a lawyer, at Mr. Cook's request, when he went recently to a small town in the Catskills to collect evidence against Mrs. Cook. The picture

taken at that time is in the possession of Falk, the photographer, and will be shown in court when the case comes up for trial. It shows Mrs. Cook sleeping peacefully beside a gentleman who does not in the least resemble Mr. Cook.

The case is of special interest, because this is probably the first instance in which the camera has played the part of a witness. Augustus Cook married pretty Annie Snyder a little over two years ago, and went to board at a house in East Eleventh Street, where the husband had lived for a long time. Previous to his marriage, Mr. Cook had a room mate and chum in the person of Godfrey Landsman, who is a sugar expert in the Custom House. After the marriage of his friend, Landsman continued to live at the same place, and he and Mr. and Mrs. Cook were on the very best of terms.

Landsman is a swarthy young man of twenty-eight, and is described by those who know him as a gay and dashing bachelor. Mrs. Cook is a brunette, plump in figure and lively in disposition. Mr. Cook was delighted that his bride and his friend were on such good terms, and never dreamed until three weeks ago that their relations were more than platonic. On August 27 facts and circumstances came to his knowledge that made him a very unhappy man. On the date mentioned Landsman told his friend Cook that he had obtained a two weeks' vacation, which he proposed to spend in the Catskill Mountains. He told Mr. Cook that he was going to Griffin's Corners. Now Griffin's Corners is just seven miles distant from a little mountain resort called Margaretville, and at Margaretville Mrs. Cook was domiciled for the summer. Landsman told Mr. Cook that while he was in the mountains he should call on Mrs. Cook, and Mr. Cook said very sincerely that he should be delighted to have him do so.

On September 1 Mr. Cook went to Margaretville himself. His wife had previously written him that "Godfrey" had grown tired of Griffin's Corners and had gone to Margaretville and was stopping at the same boarding house that she was. When Mr. Cook reached Margaretville he was met at the depot by his wife and Landsman. During a drive that afternoon Landsman told Mr. Cook that he had been in Margaretville since the Tuesday before. This statement conflicted with the statement of Mrs. Cook, who said that Landsman had come on Thursday, two days later.

As soon as he got home from his drive Mr. Cook questioned his wife closely. She retorted angrily, and the two parted the next day, Mr. Cook coming back to town, and Mrs. Cook remaining at Margaretville.

Upon his return to the city Mr. Cook consulted his friend, Benjamin Falk, the well-known photographer of Upper Broadway. The latter told the troubled husband that he saw no way to help him, but that possibly his brother, Isaac N. Falk, a lawyer, having offices in Temple Court, might be able to help him.

On Thursday, of last week, Mr. Falk, Mr. Cook, and a Mr. Benuett, who was to be a witness to what might transpire, left New York for Margaretville. Mr. Falk is an expert photographer, having learned the art in spare moments at his brother's studio. He took with him a magnesium, or detective's camera, and a summons already drawn directing Mrs. Cook to answer her husband's petition for divorce, and another asking Godfrey Landsman to answer to a \$10,000 damage suit. At the depot in Margaretville, the lawyer, the husband, and the witness were met by Liveryman Jerome Dickson, the constable of the village. The trio were driven at once to the boarding house at which Mrs. Cook and Godfrey Landsman were stopping. It was then 9.45 o'clock at night.

Everything was quiet at the house, and everybody had retired. Landlord Boyes was awakened without arousing the other inmates of the dwelling, and when he was told the nature of his visitors' errand he admitted them readily. A knock at the door of the room occupied by Mrs. Cook was unanswered, but the key was not turned in the lock, and the door opened readily. The room was vacant, but Mrs. Cook's clothes were on the chair. The door of Godfrey Landsman's room, across the hall, was next tried. It, too, was unlocked, and opened to the turn of the knob. Mr. Falk, Mr. Cook, witness Benuett, landlord Boyes, and constable Dickson, tiptoed noiselessly into the room. A lamp on a table was dimly burning.

It would have been a very simple matter to turn up the light and reveal what the gloom concealed, but lawyer Falk wanted to get the best evidence obtainable, and he let the lamp alone. Instead, he adjusted his detective camera and flashed his magnesium powder. The dazzling brilliancy was over in less



than a second of time, but the camera had had time enough to record upon its "negative" testimony which was unimpeachable. It revealed Mrs. Cook and Godfrey Landsman asleep.

The flash of the magnesium powder awakened the sleepers. The wife became ashen pale, but did not speak. Landsman moaned and shuddered with fright. Cook could not control himself, and struck him several blows with a walking cane. As the last blow fell, Mr. Cook exclaimed: "You're a nice friend." And those were the only words that passed between them.

Before the party who had invaded the bed chamber privacy had left the room, the papers in the divorce and damage suits were served upon Mrs. Cook and Landsman.

Landlord Boyes, who is a real estate dealer in Margaretville, wanted to turn Mrs. Cook and Landsman out of the house on the instant, but lawyer Falk persuaded him to permit them to remain until morning, as the night was cold and there was no place where they could go.

Mr. Cook and his friends went back to the depot and waited until the early morning train, which brought them back to New York. The present whereabouts of Mrs. Cook and Landsman are unknown. Mr. Falk said yesterday that he should push both suits vigorously.

## THE MODERN PRACTICE OF PHOTOGRAPHY.\*

BY CHARLES EHRLMANN.

THE period of fifty years from 1838 (when Daguerre announced his discovery) to 1888, embraces the

### HISTORY OF PHOTOGRAPHY.

It may be well to review what led to its discovery, and why it has been called "a child of optics and chemistry."

Among the ruins of Nineveh was found a double convex glass lens, which must have been made more than one thousand years before the Christian era. This is the first optical instrument of which we know. Pliny observed that yellow wax began to bleach when exposed to sunlight, and other organic substances were known to change colour in light; some of them were noticed to darken, while others faded, and of an organic matter the Greeks knew opal to lose its lustre under the influence of sunlight. But no advance towards utilizing these effects was made till the alchemist's search for gold opened the path for modern chemistry by accidental discoveries.

Fabrizius noticed, in 1556, the action of sunlight upon silver compounds, and described it publicly, but as further researches seemed to lead him from his search for gold he did not pursue his discoveries. As time progressed, however, advances were rapidly made towards the discovery of the art of depicting objects by the aid of light.

In 1727 T. A. Schultze, a German, covered paper with a mixture of chalk and silver-nitrate, exposed it to light under a sheet of semi-transparent paper, and obtained a reversed or negative copy of it.

When we allow direct sunlight to fall upon similarly prepared paper, and interpose a solid object, the shadow cast by it prevents light from acting, and a reversed silhouette (a white figure upon a black ground) is the result. Thus were made the first photographic portraits.

Highly important discoveries were made by Charles W. Scheele, who was also a German, though at that time (1777) his home, Stralsund, being in the possession of the Swedes, English historians say he was of the latter nation. He found differently coloured lights to affect chloride of silver in different degrees of intensity, and stated that silver salt would blacken as much under violet light in fifteen seconds as under red in twenty minutes. He furthermore found the blackening of the silver salt to be caused by its decomposition into elementary substances—chlorine gas and silver. The former escapes, the latter remains in finely divided metallic form. What Scheele found has been retained as a basis upon which we, in America, have built a theory of photographic printing, although others have frequently stated the result to be of a more complicated nature.

Let us now turn to the work of the Italian philosopher, Baptista Porta, who, about the middle of the sixteenth century, invented the camera-obscura.

The camera-obscura at first consisted simply, as its name implies, of a darkened room, to which light was admitted only through a single small hole in the window-shutter. In such a room, when the sun is shining brightly, a faint inverted image of external objects, as the houses, trees, &c., upon which the window

looks, is seen upon the white surface of the wall or screen which faces the window. Porto improved this primitive contrivance by placing a double convex glass lens in the aperture of the shutter, outside which a mirror was placed to receive the rays of light, and reflect them through the lens. The image upon the screen within was thus made brighter and more distinct, and was, moreover, shown in an erect or natural position. Crowds flocked to Porta's house in Naples to see these pictures painted by light, glowing with colour, and depicted with marvellous accuracy. Soon further improvements were made, and the camera-obscura became a favorite adjunct to the country houses of the wealthy, often taking the form of a small circular building, erected, if possible, on a hill-top.

With the dawn of the nineteenth century all things were more propitious for the development of scientific matters. The progress made in chemistry enabled Wedgwood and Sir Humphrey Davy to make successful experiments toward photographing. They employed, first, nitrate of silver, but, later on, found chloride of silver to be far more sensitive to light than it, and thus corroborated the results of Scheele. They both formed pictures upon a thin stratum of it by Porta's camera-obscura, but encountered a difficulty which even Sir Humphrey's superior knowledge of chemistry could not surmount. The light, or white, part of the picture obtained continued to be acted upon, and the whole stratum of silver chloride turned black speedily when held in light. A chemical agent to fix the image was wanted. Many media to do this had been proposed, but with all of them objectionable features were encountered, till a soda salt—the hyposulphite—was used. This salt had been first observed by Chassier, in 1799, but was not used for photographic purposes until Sir John Herschel employed it, in 1840.

In the early part of the present century, Joseph Niecephore Niepce experimented in a different direction to attain the same results. He exposed to the light of a camera steel plates coated with a solution of asphaltum, and removed the non-acted-upon fossil rosin by means of essential oils. The method had, at the time of its discovery, but little practical value, but upon it were built highly important photo-mechanical printing methods which are yet in use.

Louis Jacques Mande Daguerre invented a process by which pictures were made in the camera upon iodized silver plates. Niepce tendered him aid and his extensive experience to such a degree that it has remained doubtful to many historians whether the credit of actually accomplishing the feat is not rather due to Niepce than to him whose name it bears.

Daguerreotypes were soon very much improved upon, and we can say without hesitation, that within a very short time American operators became distinguished in this art. With the improvements made, Daguerreotype became of practical and commercial value, and its followers were soon counted by the thousands. Its every impression required a long and tedious operation, however, and a desire to multiply them with ease and at little expense soon became manifest.

John Fox Talbot then made paper negatives—that is, reversed pictures, positives, and copied from them in any desirable number upon paper. As this had to be done by placing the negative into absolute contact with the positive paper, a glass support became necessary, and the idea to impart light sensitive matter to the glass plate itself was soon suggested. To do this, a variety of carriers were proposed and experimented with, among them being glue, boiled starch, serum, gums, albumen, and, finally, collodion, the two latter being found to work exceedingly well. An albumen process, invented by A. Whipple, of Boston, was, however, soon superseded by the collodion film.

Collodion, a solution of gun-cotton or pyroxyline in ether and alcohol, was first introduced by Maynard, also a Boston man. With it extremely fine and beautiful work has been made, distinguished by unparalleled brilliancy, transparency, and general good printing qualities. From the collodion negative was derived the direct positive, ambrotype, or "tintype," as it is vulgarly called.

To better understand my subsequent description of and demonstrations on modern photographic processes, such as we teach in the Chautauqua School of Photography, I have thought it necessary and interesting, perhaps, to many, to introduce the subject with the foregoing brief outline of the history of photography.

We have noticed that a combination of chlorine with silver furnishes a highly light-sensitive substance. Thus we obtain with chlorine, also with iodine, bromine, and fluorine, salts or

\* A Lecture delivered at Chautauqua on the Photographer's Day.



haloids, which are the basis of all photographic operations. With the Daguerreotype a metallic silver plate was exposed to the vapours of iodine, and thus a sensitive surface was obtained. Fox Talbot proceeded differently to prepare sensitive paper. He impregnated it with a solution of an alkaline iodide, and by bringing it into contact with nitrate of silver formed iodide of silver by double decomposition, which remained upon the paper, while the alkaline nitrate was washed away.

[*Experiment.*—In the solution of gun-cotton in ether-alcohol, which you see here [showing] we have dissolved an alkaline iodide, that of ammonium, and with it a metallic bromide, that of cadmium. With this collodion we coat a perfectly clean glass plate, and when the solvents, ether and alcohol, have nearly all evaporated, plunge it into the sensitizing bath, a solution of nitrate of silver in water, slightly acidulated with chemically pure nitric acid. You will perceive that as soon as the clear and transparent collodion film comes into contact with the silver salt, a similar reaction to that you have seen before will take place—the film turns yellowish-white. Iodide of silver and bromide of silver, respectively, is formed on one side, and nitrates of ammonium and cadmium on the other. The former is retained in the film, the others remain dissolved in the bath. The film has become sensitive to light, and is now ready for exposure.]

As time and continuous studies have been instrumental in improving our work, we have also been able to reduce the time of exposure to light. The first Daguerreotypes required as long as thirty minutes. A collodion negative could be made in from fifteen to one second, but with our present mode of working we can make a picture in less than the one-thousandth part of a second. With skill and proper appliances we can depict a projectile in motion, travelling more than sixteen hundred feet per second; we can photograph the least refrangible rays of the spectrum, and total darkness, even, does not prevent us from photographing.

The substances carrying sensitive salts on these glass plates is gelatine [showing]. Not as with the collodion plate do we prepare the sensitive film on the spot, and for immediate use, but we incorporate the sensitive silver haloid with a gelatine solution or emulsify it. The viscosity of the gelatine solution keeps the finely divided precipitate in suspension, and, with proper precautions, is retained there. As bromide of silver is the principal substance contained in our sensitive films, that substance has been named bromide of silver gelatine emulsion.

Emulsification being completed, the mass is either heated for some time to attain high sensitiveness, or digested in alcohol for several days to produce the same results. After heating or boiling, the emulsion is poured in a cool flat dish, and allowed to turn to a jelly. It is then cut into shreds or fragments with an ivory or bone knife, washed in ice-water to remove all soluble salts still present, re-liquefied by gentle heat, and finally spread upon glass plates. When dried, these plates are of very high sensitiveness, and are always ready for use; they can be stowed away and kept for an indefinite time.

Emulsion-making and plate-coating are difficult operations, requiring close observance of the different stages through which the preparation passes. A great deal of patience is required, but it is a very fascinating and interesting work. It is certainly not my intention to show you these operations in all details, but those interested in our school may have the opportunity to pursue the subject further.

When we proceed to make a photograph, we retire first to the dark-room, and insert a sensitive plate into the plate-holder. The camera having been previously placed in proper position toward the object to be taken, focus found, an exposure is made. The plate is not visibly impressed by the action of light, but the exposure results in a latent image, which to bring forth, or develop, is the next work to be performed. As the Rev. W. H. Burbank has said: To the eye, and even to the microscope, an exposed plate shows nothing to distinguish it from an unexposed one. The developer alone detects the difference, without, however, conveying any information as to the nature of the change. Notwithstanding much patient investigation, the question of the nature of the latent image is still an unsettled one. The most commonly accepted theory is that a molecular change is produced by the action of the light upon sensitive compounds, the molecules being pulled apart, as it were, and so made less stable. This molecular change is not supposed to produce any separation of elements, such as occurs when a visible image is formed by the action of light. The function of a developer is

to make this change visible by reducing the silver in those parts acted upon by light to the metallic state.

It has long been a disputed question among photographic savants whether the change produced in a sensitive compound of silver is a physical or a chemical change. Without burdening you with the arguments advanced in support of each of these positions, it may be stated that at present the weight of authority seems to be on the side of a chemical change. It may be regarded as a tolerably certain fact that under the action of light the haloid salts of silver—that is, the bromide, iodide, and chloride—have a tendency, more or less powerful, to return to the metallic state; a tendency which is promoted and made permanent by the action of developers, which are always reducing agents; that is, they are substances which are able to reduce the soluble salts of silver to the metallic state. We may thus take it for granted, for the present at least, that the change of condition produced in the sensitive compounds employed for the production of negatives is a chemical, not a physical reaction.

The proper development of a negative is an art acquired only after long experience and many failures. It cannot be learned from books; it must be acquired at the developing table. The problem to be solved is to bring forth on the exposed surface a reproduction of the original which shall preserve all the varied tones, and be capable of reproducing in the print the impression made by the original.

The picture resulting from developing is a negative; that is to say, those parts of it which appear bright or white in nature are black, and the natural shadows are transparent, while middle tints are represented proportionately. The figures thus obtained remain upon a whitish, opaque ground, which must be removed to obtain a plate of such transparency as to make it a perfect printer. Hence we dissolve the opaqueness from the plate by means of hyposulphite of soda, or remove the silver haloids not acted upon by light and developer. [Here the lecturer showed his audience an unexposed plate, a developed plate, and some fixed plates.]

After copious washing we have now a glass plate upon which still rests the original coat of gelatine, but instead of carrying within its body a sensitive compound, the picture taken is there in the form of metallic silver.

From these negative plates are made positives; that is, we bring paper made light-sensitive with chloride of silver, into absolute contact with the film side to the negative, and expose it to light, and thus we produce positive pictures, because, as light cannot pass through the black or opaque parts of the negative, the chloride of silver paper underneath remains white, and the transparent portions of the negative, allowing light to act, produces the shaded or deeper parts of the picture. Wherever the densest opacity exists the paper will remain the whitest, and half tones or middle tints where opacity or transparency exists proportionately.

Photographic prints are made much darker than they should be when finished, because subsequent operations, like colouring them in a solution of gold, and "fixing" them, deprives them somewhat of their density.

The chemical result of positive printing on paper is similar to that of developing a plate to a negative—metallic silver. Through the action of light upon chloride of silver, chlorine is liberated from the compound, and metallic silver remains. The amount of chloride of silver not converted into metallic silver remains upon the paper, and must be removed with hyposulphite of soda in the same manner as we have dissolved the bromide of silver from the emulsion plate; but before doing this we subject the print to the operation of toning, that is, we give it an agreeable colour, from a dark, warm brown to a bluish-black, according to the taste of the operator, and without which it will retain a brick-red tone. This is done with chloride of gold, neutralised with an alkali, or alkaline salt; the result is a substitution of metallic gold for metallic silver, and an agreeable colour of the print. [Here the lecturer showed a sample of white unexposed paper, a sample partly printed upon and one fully printed and toned.]

The toned, fixed, and well-washed pictures are then mounted upon cardboard and finished. It required just twenty-six operations or manipulations to make a photograph, from taking in hand the sensitive plate till the last finishing touch.

Dry emulsion photography has wrought a decided revolution in the art science, and has become a useful adjunct to scientific researches, for with it we have penetrated darkness, and made photographs where light does not exist; we have impressed the



least active light (the ultra-red of the spectrum) into our service, and have detected heavenly bodies not visible with powerful instruments. We depict animals in motion, and the dust clouds of a tornado rushing rapidly upon us. What half a century ago was out of reach, we accomplish now with ease.

It is an earnest occupation, that of the photographer, and to attain to perfection requires as much energetic study as any other branch of science. But there is also much pleasure in it, as many of you can certify. Photography is sober reality. We enjoy nature as it is. We cannot idealize our subjects as the painter or sculptor can, but we can play some tricks, and produce, occasionally, miraculously appearing effects.

To show to you what can be done in this direction, I have only to produce a spirit photograph as it was recently made in a New York Court, to prove false the assertion of a notorious swindler. [Here the Lecturer made and exhibited a "magic" or spirit photograph.]

### Notes.

The Exhibition of the Cardiff Amateur Society is to open the 22nd of next month, and applications for space will be received by the Secretary, E. H. Bedford, of 127, Bute Road, up to October 5th. Further particulars on p. 624.

Transvaal photographers are alive to the signs of the times. We read in a Transvaal paper of one gentleman who has been commissioned to photograph mining properties whenever he pleases, whether above or below ground. "These photographs," says the paper in question, "are intended for publication, to enable speculators at home to have an idea of what Johannesburg surroundings are like." We do not see how photographs of mines are likely to assist one in forming an idea of the value of the property, but if speculators and shareholders derive any satisfaction from looking at the pictures, by all means let them indulge in it. In many cases, we find, such photographs will in after years serve as unpleasant reminiscences.

It is said that consternation reigns among the photographers who do business on the beach at Brighton. The "Beach Committee" of the Town Council have abolished the "niggers," and it is feared that the turn of the photographers will come next. Some time ago the Town Council gravely discussed the propriety of placing a veto on the photographers, but finally contented themselves with some stringent regulations. But the photographers just now do not feel at all safe.

One often wonders what charm the seashore photographer thinks there is in the inducement to be taken "as you are." They all adopt it. A lady who has been staying at a certain watering-place says that every morning she was accosted in this way, the joke being that the occasion was generally one in which she would prefer not to be taken as she was. For instance, she alights from the bathing machine with her hair damp and out of "friz," and her nose and cheeks slightly red from the coldness of the water. Such a time is scarcely one to be taken "as you are," yet the request is invariably made. She puts on her oldest dress because "anything will do for the sands," but the photographer calmly ignores this, and asks her to be taken "as you are." She essays a donkey ride to please the children, and is at once solicited to be taken "as you are."

Putting the matter as one of common sense, the phrase is indefensible, because you must either be taken "as you are," or "as you are not." And the latter condition is clearly impossible.

The *Evening Post*, commenting on what appeared last week in these columns relative to the Whitechapel murder, says: "When the police are at their wits' end to get a clue, there is no harm in heaping up suggestions, but it is difficult to see how any amount of photographs of the dead body would help the cause of justice." If the *Evening Post* cannot see the use of photography in regard to the detection of crime, we need not waste time in endeavouring to convince it. When we say that on a point apparently so trivial as the position of the body, when first discovered, matters of vital importance often turn, we only speak on the authority of criminal records. Our police are not trained observers, and may easily fail to notice insignificant details. But in the case of a mysterious crime no detail is insignificant. Evidence in such cases is often the result of memory set in motion for the first time by the questions which one asked. It is not wonderful, therefore, that we get apparently inexplicable contradictions. Photography would at least obviate this.

The *Globe* had recently some remarks bearing on a subject, on which we commented a few weeks ago, as to the difference which exists between the real and the ideal celebrity. It observes that the disillusion brought about by the exhibition of a photograph of some favourite author or artist, or other personage of renown, is often very keen. When such photographs get in the shop windows, "fantasies are sometimes fulfilled; more often they are not. And then there is, metaphorically, weeping and gnashing of the teeth." On the whole, the *Globe* is inclined to think, "unless an author knows himself, or herself, to be an Adonis or a Venns, he or she will do well to remain veiled from the public eye, and not to run the risk of dis-illusionising those who have, so far, loved them for their works alone."

There is something in this, and the consciousness of a shortcoming in the direction of facial beauty may account for the repugnance which many people of note entertain towards sitting for their photographs. No one can say that George Eliot was not discreet in not being photographed. Mr. Ruskin in his younger days was terribly disappointing in his photograph, and this failure may have had something to do with his former dislike of the art. Since he has grown a beard he is far more presentable, and the consequence is, we venture to think, he has been photographed more often. Herbert Spencer's face, in the opinion of many, does not suggest the profundity of thought which the owner possesses, and the late Mr. Darwin's contour too ludicrously exemplified his favourite theory to need dwelling upon. Still we all like to know what our favourite authors are like, and if the very moment they became famous they go and get photographed the public will not have time to indulge in fantasies, and unpleasant shocks may thus be avoided.



The *Court Journal* tells of a photographer who, in taking a photograph of the fashionable crowd who congregate at Boulter's Lock on Sunday afternoon, also secured the portrait of a thief in the act of picking a pocket. This photograph rendered a distinct service to society, but the misfortune was that the thief got off scot free, because his detection did not take place until some hours afterwards, when the negative was developed.

It is time an instantaneous photograph was taken of the brutal sport of pigeon shooting. A correspondent writes: "I visited the Welsh Harp tea gardens on a recent Saturday afternoon, but I must say my pleasure was completely spoiled by the sight, which I accidentally witnessed, of a couple of sportsmen (!) maiming pigeons by wholesale. As a photographer, I regret I had not my camera with me, for I am sure a picture showing these poor crippled birds fluttering on the ground would convey a better idea of the inhumanity and cruelty of this so-called pastime than any amount of description."

A correspondent who was at Spa during the continuance of the "Beauty Show," writes to say that "the determination of the Committee to, on this occasion, require the personal attendance of competing 'beauties,' and no longer award the prizes on mere photographic evidence, did not result in anything approaching success. For whereas the former 'Concours' undoubtedly brought together a large collection of really beautiful photographs, last week's show was attended by no competitor who could even be termed exceptionally good looking. The twelve girls—and some were most palpably very old ones—who sat on the platform at the Casino night after night, had no pretensions whatever to be considered 'beauties,' and not more than three or four of them at most would stand a chance of getting into the front row of the *ballet* at a West-End London Theatre. It would be possible, in fact, to walk about any West-End street in our metropolis, even at this time of the year, and meet twelve prettier girls in half as many minutes. One day during this 'Concours' I noticed a photographer enter the Casino with his camera, but no photograph had come out up to the time I left Spa. Should one be published by the Committee, it will be a very bold proceeding on its part, and it will be especially interesting to see the outcome of the operator's skill. If it should really result in the photographic presentment of twelve 'ladies' with apparent claims to the designation of 'beauties,' then all I can say is that the wonders worked by skilful 'retouching' and manipulation will have assumed a well-nigh miraculous proportion."

#### INSTANTANEOUS STUDIES.

No. 17.—THE DETECTIVE CAMERA CRAZE.

(Scene.—A meeting of any Society.)

*Chairman.* The meeting, as you know, is called for the purpose of discussing detective cameras. If any member has brought any apparatus, now is the time for its exhibition. Mr. Smith, I think you have something.

*Mr. Smith.* Yes, Mr. Chairman. This is my patent umbrella detective arrangement. The camera is concealed beneath the covering, in which a hole is made for the lens. The exposure is made by simply pulling a string which runs through the centre of the stick to the handle.

(Some discussion took place, during which the ingenuity of the idea was much admired. A fatal drawback was, however, pointed out in the fact that the umbrella camera could only be consistently used during a shower of rain. Mr. Smith said he was not prepared with a plan by which the camera could be used when the umbrella was closed. He would, however, be pleased to consider the subject, and bring the instrument again before the notice of the society.)

*Mr. Brown.* I have here a camera specially designed to remove an objection which all who have gone in for detective work must have felt: I allude to the detection of the detective photographer himself by the person photographed. Some people do not like being photographed against their will, and when they see anyone with a bag, or box, or book, held conspicuously in their hands, and this person looking fixedly at them, they know what's up.

*The Chairman.* Mr. Brown's remarks, I think, all will endorse. I have heard of detective photographers being assaulted by irate persons who objected to being taken.

*Mr. Brown.* My plan is to conceal the camera in a sort of bread basket, which, carried over the shoulder, would not excite the slightest suspicion. To make sure of the person to be photographed, a mirror is used. You therefore take the person's portrait with your back turned towards him.

(The bread basket camera excited much admiration. It was felt, however, that some courage would be necessary to go about with a bread basket at one's back.)

*Mr. Jones.* I should like to bring before the Society a detective camera designed especially for ladies. It is a camera concealed in a perambulator. The lady pushes the perambulator in front of her, and makes the exposure by a very simple arrangement. The presence of the children, of course, does away with any suspicion of photography.

*The Chairman.* A capital notion, but obviously suited only for ladies who are married and have children.

*Mr. Bragshaw.* There would be no difficulty in single ladies who wanted to use the apparatus borrowing a child or two (*hear, hear*).

*The Chairman.* Quite so; but would they?

*Mr. Jones.* I hope to get over the difficulty shortly by a small camera designed especially for single ladies. It will be placed in front of the muff, and occupy the place of the little handbag often seen attached.

(A vote of thanks was unanimously passed to Mr. Jones.)

*Mr. Grimshaw.* This is a detective camera suggested by a visit to Hampstead Heath on Bank Holiday. You will notice that it exactly resembles a concertina, but possesses an immeasurable superiority over that instrument, inasmuch as it emits no sound. To carry such an apparatus in front of you would be quite natural. It could also be moved up and down after the style of concertina playing, and no one would ever think it was a camera.

*The Chairman.* I fancy there is a slight objection in the fact that the person using such a camera will be taken for an individual of the 'Arry type.

*Mr. Grimshaw.* Possibly; but I do not think that would hurt you, providing you were not an 'Arry.

(A vote of thanks was passed to Mr. Grimshaw. Other ingenious detective cameras, more or less practicable, were also exhibited. A camera concealed in a violin case was warmly applauded, as was also one of a cylinder form enclosed in a music roll. A camera of small size contained in the heel of a boot was admired for its ingenuity, but the necessity it involved of holding up the foot in an awkward and indecent attitude (the exposure being made from the flat side of the heel) was thought to be a fatal objection. On the whole, it was agreed that a most instructive and entertaining evening had been passed.)



## PHOTOGRAPHY AND ART.

BY ERNEST KNAUFF.\*

THE rapid progress made in photography during the past quarter of a century has been something marvellous; and the excellent results produced by the camera to-day have led many to suppose that there was a possibility of its interfering materially with the profession of the painter and the draughtsman.

But the contrary is the case. The more perfect the work of the camera becomes, the more perfectly will the public be made to understand nature, and especially the shadows in nature. This will cultivate the public taste so that they will be ready to receive the highest forms of art in the future. Because the less a nation knows about nature, the less capable are they to appreciate art.

At present the camera does not reproduce in its monochrome the colours of objects in exactly the true relation to each other—in what the painter calls their true values. But every day in the art we see less and less of this shortcoming. The splendid effects gotten by Mr. Kurtz, of New York City, by his orthochromatic process in photographing paintings so that the colour of the objects in the picture are represented in true relation to each other (that is to say, a blue sky comes out not totally white, as used to be the case in old photographs, and yellow objects made light, and not black, as formerly), is indeed encouraging.

The true painter hails with delight these improvements in the art, because every good picture produced, whether by human or mechanical aid, is a new cultivating instrument with the public.

The more the shadows in the human face are looked for by the ordinary person, the better for the artist, as it is his perfect delight to paint as Rembrandt did, the head half in the mystery of shadow, and not as Queen Elizabeth always ordered her likenesses to be made, totally without shadow.

The photograph is generally trusted more fully than the human artist; and when a person sees a photograph which does not look like the original, he is apt to be a little less critical at first than if a painter had made the portrait. The photograph sets him to thinking what it really is which makes the face of his friend or his child. And it is a great thing when people are set to thinking as to what it is which causes the impression which their minds have of certain things.

There were two families in New York who were happy in the possession of a baby—that is to say, each family had its baby, about a year old. For some reason or other, it occurred to both families at about the same time to have photographs taken of their respective infants. Without either knowing it, they went to the same photographer.

In due course of time, one of these families received the proofs from the photographer. All crowded round to see it. They were handed about, criticised and admired, a favourite one selected, which was pronounced “just too sweet for anything,” and it was about to be put in an envelope and returned to the photographer, when the nurse asked to see it again, and, looking at it a moment, raised a doubt as to the dress represented on this baby being identical with that worn by their cherub the day of the operation. Sure enough, all now said it was not right. And in a few moments it was discovered that the proofs for the family up the street had been sent instead of the right ones.

This only shows how limited the knowledge really is which some persons have of the human face. Show someone a photograph of some natural scene which they are not very familiar with, and where are no definite landmarks, and how often they are unable to tell you just exactly what spot it represents. They know the general character of the scene, but cannot tell you where is the east or west. Let photographs show how much there is to observe in a landscape, and it does the artist a great service. Then, again, in making views of vast tracts of land which are not wholly picturesque, not enough so as to tempt the great painters, yet which are very interesting to the traveller and scientific student. In giving us correct reproduction of such country it serves us greatly.

In architectural views, in the rendering of shadows as they are on all parts of the building at the same time, photography does much more than the artist when he gives us in a painting, perhaps the morning shadows on one part of the building and the afternoon shadows in another.

In the stereopticon views which photography has enabled lecturers to use, photography has again done us good service, because it makes these lectures much more graphic, as everyone knows, and saves a great deal of explanation and describing.

In photogravure, photography has permitted us to reproduce paintings at a much less cost than was formerly possible in engraving and etching.

In photographs of monuments, again, photography has almost taken the place of the draughtsman's work. And while some few artists are thus put out of employment, yet, as this is a much more certain method than free-hand drawing, the artist will not complain, because, on the other hand, it permits scholars to study archaeology more thoroughly, and the study of archaeology always leads to the consideration, at least, if not the study, of modern art.

In instantaneous photography the camera wonderfully helps the painter in giving the truth as to action in both man and animal in their rapid movements, which they otherwise could not learn without an infinite amount of trouble and patient observation.

In many other ways the art of photography is not an art to be feared by the painter or draughtsman; and, least of all, will be the perfected art of the future, when photography will give us a truer relation of colours to one another than it does at present.

## Patent Intelligence.

## Applications for Letters Patent.

- 13,301. HENRY CHARLES BOND, 35, Chancery Lane, London, for “An Improved Process for the True Reproduction of the Colours of Nature in a Compound Photographic Print.”—Sept. 14, 1888.
- 13,315. BENJAMIN WILLCOX, 47, Lincoln's Inn Fields, London, for “Improvements in Photographic Apparatus.”—*Jean Joseph Leon Guyard, France.*—Sept. 14, 1888.
- 13,521. HENRY JOSEPH SHAWCROSS, 15, Water Street, Liverpool, for “Improvements in or connected with the Production of Photographic Sensitised Paper, Woven or Tissue Fabrics, Gelatine, or Collodion Films, Glass, Porcelain, Metal, Wood, and like media, for use in the production of Copies of Photographs, Pictures, Drawings, Designs, Writings, and the like by the action of light.”—Sept. 19, 1888.

## Specifications Published during the Week.

7318. WILLIAM CHARLES HUGHES, Optician, Brewster House, Mortimer Road, Kingsland, London, N. for “Improvements in Magic Lanterns for Enlarging or otherwise, and in Apparatus used in connection therewith.”—Dated 17th May, 1888.

My invention consists (first) in the construction of lanterns in such a manner as to give increased portability, and in the shape of condensers to be used therewith. (Secondly) In the construction of a lime carrier whereby I am enabled to insure more perfect and regular incandescence and immunity from clogging of the working parts than has hitherto been accomplished. (Thirdly) In the mechanical arrangements of a frame for holding negatives, &c., which I am enabled at will to change instantaneously.

In order to more fully understand my said invention I have appended the accompanying sheet of drawings, fig. 1 of which represents the device according to the first part of my invention. Fig. 2. The condensers heretofore referred to. Fig. 1 A is the body of the lantern made of any suitable material and shape, with an extension piece or pieces B similar in shape to that of the body A, into which it is made to telescope; fitted to the extension piece B is a frame C, in which is provided a slot for the reception of the slides. Attached to the frame C is a collapsible part D, carrying at its front end the lens E, similar to those ordinarily in use, the whole lantern resting on the base board F, which is jointed at G. Thus it will be seen that when the extension piece B is telescoped into the body of the lantern A, and the part D completely collapsed, and with the part H of the base-board turned up, the whole apparatus resolves itself into a small and compact body of such a form as to render it very portable. Fig. 2 is a perspective view of the condensers heretofore referred to. I make rectangular or square as may be desired in shape. By this means I am enabled to get a much larger field with a relatively smaller lantern than would be obtainable with those ordinarily in use, thus reducing the size of the lantern to the lowest possible limits. Fig. 3 is a sectional view of the apparatus used in carrying out the second part of my invention, in which I is the lime carrier, having a rotary and up and down movement imparted to it by means of the bevil wheels J and K, the small bevil wheel L being fixed to the tubular part M of the lime carrier, which has

\* Read at Chautauqua on the Photographic Day.



a female screw at its lower part, into which works the male screw M, the said screw M being firmly clamped in the required position upon the pipe N, which leads to the jets placed immediately in front of the lime as is usual.

The *modus operandi* being as follows. Upon rotary motion being given to the spindle O, which is loosely fitted in its bearings to allow same to rise and fall with the bracket I', the bevil wheel K, which is fitted to the spindle O, is also turned, and gearing with the small bevil wheel J rotates the carrier I by means of the tubular part L, which connects the parts J and I respectively, and at the same time imparts to the carrier I and bracket I' an upward or downward motion (according to the direction in which the spindle O beforementioned is rotated), by reason of the tubular part L riding upon the fixed male screw M; thus it will be seen by these means I am enabled to allow the flame of the jet to play upon any desired part of the lime, and, by enclosing the screw M in the tubular part L I, effectually prevent same clogging from accumulation of lime or dirt corrodng upon it when in use.

Fig. 4 represents the carrier as mentioned in reference to the third part of my invention in which P is the frame worked, with

wishing to change the picture, by moving the handle V in the direction of the arrow, immediately the lever U rides upon the enlarged portion of the cam, causing the extremities of the toggle levers e and f to close, in so doing drawing the shutters to which they are connected by the links h h with them, said closing of the shutters being accomplished before the movable frame has begun to travel, and the opening also being effected immediately the negative is in position opposite the aperture, by reason of the lever W again falling into the recessed portion of the cam V', the sole object being not to leave exposed a negative or slide till it is really in its place ready for exposure.

Having now particularly described and ascertained the nature of my said invention, I declare that what I claim is—

First. The telescopic lantern body with jointed base-board.

Secondly. The condensers, rectangular or square, as described.

Thirdly. The lime carrier of jet, substantially as described and set forth.

Fourthly. The negative or slide-carrier substantially as and for the purpose set forth.

13,879. EDWARD VALENTINE SWINDEN, of 81, Merton Road, Bootle, in the county of Lancaster, Accountant, and JOSEPH EARP, of 50, Falkland Road, Egremont, in the county of Chester, Accountant, for "Improvements in or connected with Photographic Cameras."—Dated, October 13th, 1887.

Our invention relates to photographic cameras, or sensitised plate boxes, in which a number of sensitised plates are carried one behind the other for taking a succession of photographic pictures, and consists mainly of a method of removing the plates and stowing them after the pictures have been taken, and in the means of feeding up the plates, plate by plate.

The camera or plate box is constructed to receive a number of prepared plates, or films, and according to our invention, as each plate is used we remove it by causing it to fall forward out of the field of the following plate, and as each plate is so removed we feed up another plate to take its place.

We construct the plate box—which may form part of the camera, or be attached thereto—of such form and size as to allow a number of plates to be stowed and operated as described. The plates are fed up by springs, or like means, and are released, guided, and caused to fall forward by moveable pushes, bolts, or stops and guides, as they are used.

By removing the plates by causing them to fall forward on to the bottom of the camera, a very simple and convenient means is obtained of stowing the plate after the picture has been taken, and the camera is enabled to be kept of small dimensions; also very simple and inexpensive mechanism is required, namely, a spring or springs to feed the plates forward, and a catch or catches to hold and release the plate and allow it to fall forward, preferably face down, on to the bottom of the camera, or on to the back of the preceding plate as the case may be.

To cause the plates to fall in order, and only one at a time, we provide the top of the camera with a groove of size to suit the thickness of the plate, and we provide the part of the camera on which the plates rest with a ledge, preferably having an inclined face. At the back of this ledge we provide a bolt, by raising which the top edge of the front plate is raised into the groove, the pressure from the back plates causing the front plate to pass over the ledge; then by pressing down a bolt which is provided in the groove, and by canting the camera, the plate falls down and then forward face down out of the field of the next plate.

The plates are withdrawn from the camera through a door which is formed in the camera for that purpose.

For the purpose of isolating the plate box from the lens of the camera, we provide a shutter which is so pivotted in the camera or plate box that it can when required be caused to shield the front plate.

In the foregoing description we have set forth generally the nature, object or objects, and effects of our invention, but in order to make it more fully and exactly understood we will now proceed to describe the same by the aid of the drawings hereto annexed, and forming a part of this specification. The drawings illustrate a camera or apparatus specially designed to carry out the improvements, the nature of which has been above explained.

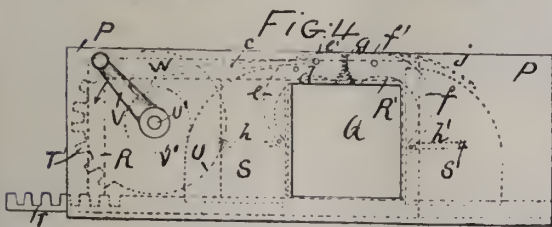
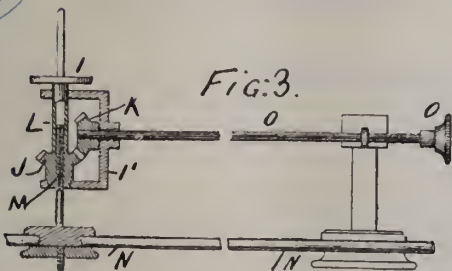
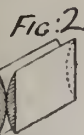
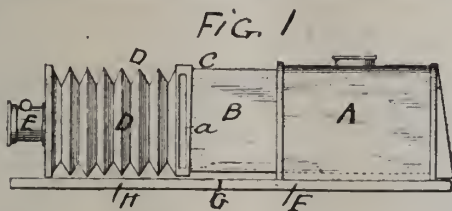
#### Description of the Drawings.

Figure 1 is a top view partly in section and with portions of the cover removed in geometric perspective of the camera.

Figure 2 is a detail showing the apparatus partly in cross section at the line XX, figure 4.

Figure 3 is a plan of the apparatus.

Figure 4 shows the apparatus in longitudinal section.



square aperture Q therein, through which the negatives or slides are projected, which are held in the movable frame R R' in the ordinary manner. S S' are shutters (two in number) made of vulcanite or other suitable material, which, upon the operator desiring to substitute the one for the other negative beforementioned, automatically close the aperture Q until such substitution has taken place. The movable part R R' has a rack T attached to the same, into which gear the teeth T' of the wheel U, said wheel being mounted upon a spindle U' and operated by the handle or crank V. The wheel U has also attached thereto, or formed thereon, a cam of the shape shown by the dotted lines V', on which rides the lever W, pivotted at c, and bearing upon a pin d of the bent levers or toggles, e f, said toggles being pivotted at c' and f' respectively, and gearing each with the other at g, and kept in position by spring j. As shown from the foregoing description it will be evident that upon the operator



Figure 5 is an outside elevation of the apparatus.

Figure 6 shows a plate provided with a protective backing according to our invention.

Figure 7 shows a modified construction of camera case.

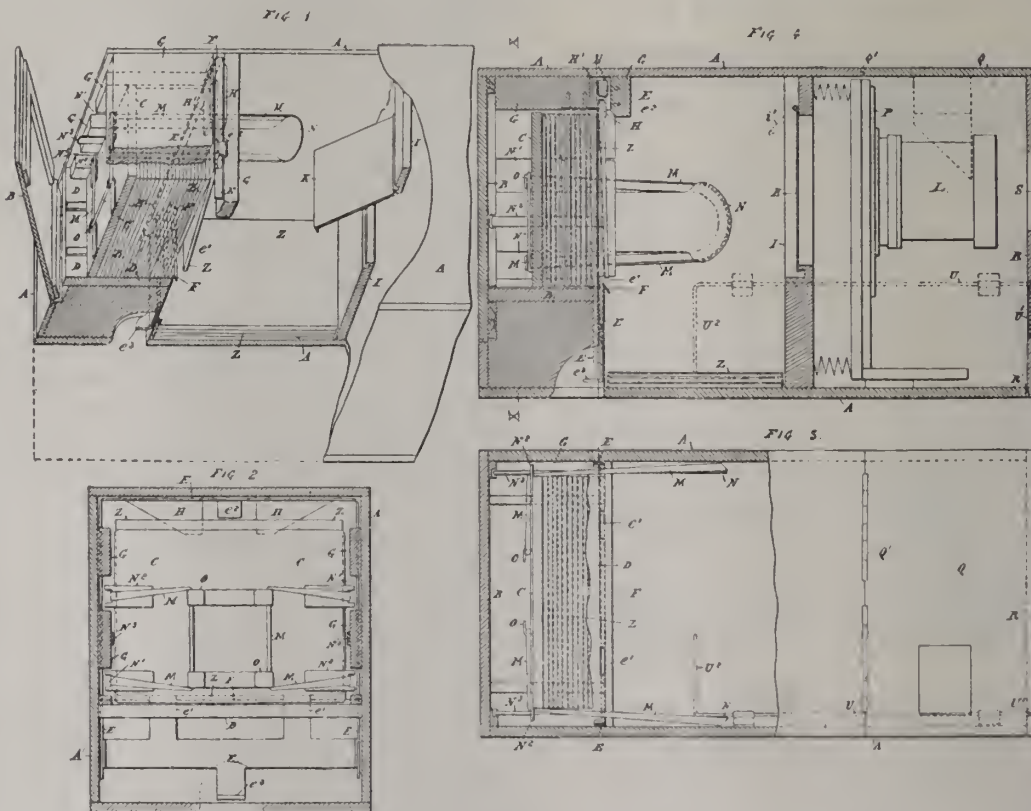
The camera is divided into three portions; one is the plate chamber which is at the rear of the apparatus; the second is the depository chamber for the plates after exposure, and lies in the middle; and the third is that in and by which the lens is placed or carried, all three portions being within a wooden case A; or this case may be made of any other suitable material. The first chamber is that in which the "dry" plates or equivalent sensitive media are stored ready for operating, and the parts within it consist mainly of a hinged door B for gaining access to the chamber, a sliding follower C, a table or platform D upon which the plates are supported, a frame E having plate elevating toes  $c'$ , and depressing finger  $c''$ , and an inclined curb F for passing the plates Z from the plate chamber and delivering them to the depository chamber. The frame E is kept in its place by the metallic strips H H', which are secured to the wood lining strips or pieces G, which are provided upon the inner surface of the case A, and it is moved up and down between these liners by a

thumb plate  $c^3$ , which is formed upon it and is located in a recess provided in the bottom of the case A.

When sensitive films or media other than glass plates, such as described, are used, such media must in all cases be sufficiently stiff, or made sufficiently stiff to render them applicable for use in apparatus operating according to our invention.

The plates Z are kept in place by metallic stops H, secured to the top bar of the liner G, and by the curb F, the upper surface or edge of which is raised above the level of the surface of the table D; the follower C keeps the plates up to the two devices as will be presently explained.

The depository chamber lies directly in front of the frame E, and is of sufficient length to take the plates easily, when lying in the horizontal plane, as shown, and it is divided from the front portion of the camera by a partition I. This partition has an aperture in it admitting the light from the lens L, to the front plate of the lot in a plate chamber. A shutter K is provided on the partition I, in order to exclude the light whenever required, and also if desired to be used as a substitute for the ordinary lens cap in making exposures, and it is operated by a lever  $i'$  placed outside the case A.



Access to the bottom of the depository chamber is had by a sliding door T, and through the aperture over which the door slides the plates can be removed from the chamber at will.

The function of the follower C is to feed the plates forward as they are passed one by one to the depository chamber, and its movement is effected by two rubber straps or bands M, under tension, arranged one on each side of the camera. The bands are held by lugs N and pass behind the frame E to the back of the follower C, where they are secured by hooks O. Between the lugs N and the back of the follower C they lie in grooves  $N^1$  formed in the liners G, and in passing over the edges of the follower C they take over forked guides  $N^2$ . It will now be plainly seen that as the plates are removed from the plate chamber to the depository chamber, the tension on the bands M moves the remaining plate or plates as the case may be up to the front stop H and curb F. To allow the follower C to be removed in order to introduce fresh plates or other objects, the bands M are first taken off the hooks O by the finger and thumb, and then placed over the end of the strips G, which lie

between the grooves  $N^1$ , the metallic pieces  $N^3$  projecting a little beyond the liners G to keep them from slipping off. When this is done the follower can be withdrawn, the door B of course being open.

Our invention further consists in providing the back of the plates of the kind herein specified with paper or other suitable material  $x$ , of a colour which would render the light passed through them non-actinic, or obviously black paper or other like material may be used instead of the coloured material. In this way, if a number of plates be used and placed together, and one of such a set be exposed to the light, the backing of the exposed plate would preserve the next plate against injury by light. The material  $x$  is preferably lapped over the top and bottom edges of the plate about one-eighth of an inch (see figure 6), as, by this means these overlapped ends of material constitute distance slips or pieces, or a means of separation when a number of plates are stowed together, as in the apparatus herein set forth, whereby they would be prevented from scratching each other. The paper or other material is, by preference, made to adhere



lightly to the plates, so that it comes away freely, or may be easily removed in the developing bath.

The front portion of the camera may be of any known construction, and is provided with adjustable focussing device, shutter, aiming lens, and reflectors, of any suitable known kind, in the ordinary way. In the example illustrated in figure 5, the lens plate P is secured to an ordinary bellows body, and is operated and used in the usual manner. The cover Q of the front portion is hinged at Q', and the end R of the camera is hinged at R', these parts thus forming respectively a lid and a front door, by which access can be had to the parts within it for any desired object. An aperture S is formed in the door R to admit the necessary light when taking a photograph, and over this aperture the shutter—which may be of any known suitable kind—is placed and works in the ordinary way. For slower exposures, that is other than

FIG. 5.

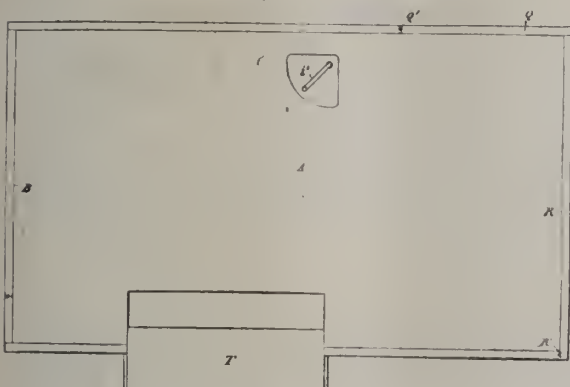
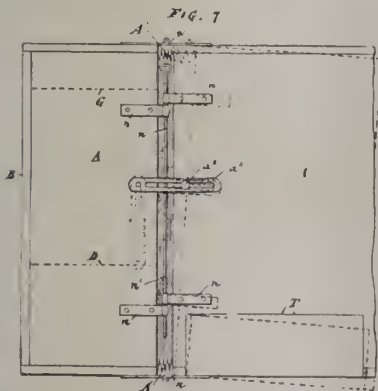


FIG. 6.



FIG. 7.



those called instantaneous, the door R may be let down, and the exposure made in the ordinary manner by using the ordinary lens cap, or the shutter K.

The operation of the camera is as follows:—

Assuming the plate chamber to be provided with its full complement of plates or any less number, the doors B, Q, and R are closed, the shutter K raised, and the ordinary exposing shutter, covering the aperture S, that is to say, assuming the camera be ready for taking a photograph of any object, such object is brought within the focus of the lens in the usual way, and the shutter is operated, and the front plate of the pile exposed in the ordinary manner; now to take a second photograph the front plate must be first removed, and this is effected in the following manner; the thumb plate  $c^1$  being pressed upwards,

the toes  $c^1$  which lie directly beneath the front plate, raise the plate until its lower edge stands above the level of the upper edge of the curb F; this lower edge will be pressed forward by the follower C, and the plate then assumes an inclined position, having its lower edge on or over the incline of the curb F (see figure 4), and its upper edge held between the plate next behind it and the stops H, these being inclined forward as shown, to allow the plate to assume an inclined position. To dislodge the plate from its position, the thumb plate  $c^2$  is now drawn down, by which action the finger  $c^2$ —which lies directly above the upper edge of the front plate—presses the plate down out of the grip of the stops, and the next plate, and thereby the plate falls on its lower edge to the bottom of the depository chamber, or on to plates already lying in this chamber, and stands in a nearly vertical position. The next and final movement consists in inclining the front end of the camera downwards, whereby the plate falls face downwards on the bottom of the depository chamber, or on to the plates already discharged, as shown in the drawings. In this manner the whole complement of plates can be removed *seriatim* from the plate chamber to the depository chamber.

In cases where it is desired to take photographs upon the plates, films, or other sensitive media, in which the horizontal plane lies across the smallest dimensions of the plates, or in any case where the camera is placed with one of its sides uppermost, instead of its normal position, we provide a rod U running between the front of the camera where it is provided with a handle U<sup>1</sup>, and the depository chamber where it is provided with a finger U<sup>2</sup>. Then by turning the handle U<sup>1</sup> the finger U<sup>2</sup> can be turned down on to the plates lying in the bottom of the chamber, and clamped by any known suitable device to hold them whilst the camera is turned upon its side, and during the operation of taking the photograph. When the operation is over, the camera is turned up to its normal position and the finger U<sup>2</sup> removed, when the plate operated upon can be passed to the depository chamber as above described.

When our invention is applied to ordinary cameras, or combined detective and ordinary cameras, we form the camera case A in two parts at or near the junction of the plate chamber and the depository chamber, and connect them together by an expanding portion A<sup>1</sup>, as illustrated in figure 7, in order to obtain an elevation or depression of the lens, and keep the plate in vertical plane—the necessity for which is well understood. To fix the inclination when obtained, links ( $a^2$ ) and thumb-screws ( $a^3$ ) are provided, by which they can be clamped and held in the required position, as shown; and as it may be desired to take photographs with the camera on its side or other position, we provide hinges ( $n$ ) on top, bottom, and sides, and pass through one set of these hinges a pin ( $n^1$ ). The particular set of hinges through which it is passed will, of course, depend upon the relative positions of the camera and the object to be taken.

The following, amongst others, are the advantages attending the use of our invention:—

A considerable number of ordinary glass dry plates, or equivalent sensitised films or like media can be carried in the camera, thereby doing away with the necessity of dark slides or other like sliding gear as ordinarily used, or heretofore proposed, and when the camera is charged with its complement, or any less number, of plates the whole are stored inside and exposed *seriatim* without once having to open any portion of the camera, or draw out any slide or sliding gear, or to manipulate them by hand within the camera, or within a covering connected with it.

The operation of removing the exposed plate from the field of the lens, and placing the next in position is accomplished by a simple movement of a small bolt or catch  $c^3$  immediately within the body of the camera, by one of the fingers or thumb, and the movement is effected in a moment's time.

As a detective camera the invention is specially applicable, as the operation may be effected without attracting attention.

The removal from the camera of any exposed plates required for development can be effected without disturbing or interfering in any way with the remaining unexposed plates, and fresh ones may at any time be added if desired, until the full charge up again.

For a given size the camera is compact and very light; for instance, a quarter plate camera of the detective class charged with a battery of two dozen brass plates respectively  $4\frac{1}{4}$  by  $3\frac{1}{4}$  inches, and fitted with a rapid rectilinear lens of  $5\frac{1}{2}$  inches equivalent focus, and space for an instantaneous shutter of any known suitable type, if used, measures about  $10\frac{1}{2}$  inches long by  $6\frac{1}{4}$  inches deep by  $5\frac{1}{4}$  inches broad.



Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed we declare that what we claim is:—

1. The improvement herein described in operating cameras or photographs apparatus, by which a succession of photographs may be taken by the apparatus, which consists in moving a plurality of sensitive plates, films, or equivalent media, arranged within the apparatus together, successively from the position in which they are placed and exposed, after exposure, out of the field of the succeeding plate or equivalent media without the use of slides or their equivalents, or internal hand manipulation, substantially as described.

2. In photographic cameras or apparatus in which a plurality of plates, films, or their equivalents are employed and arranged as described, to take a succession of photographs, the method herein described of operating said plates, films, or their equivalents, which consists in causing the successive foremost plate or its equivalent of the set to be moved forward out of the field of the next succeeding plate, and become placed face downwards, substantially as set forth.

3. In a photographic camera, the combination of a primary chamber adapted to receive and hold a plurality of sensitive plates, films, or other sensitive media, a mechanism operated by hand, by which said plates are removed *seriatim* from the chamber, a second chamber adapted to receive and hold said plates as they are passed from said primary chamber after exposure, substantially as set forth.

4. In a photographic camera, the combination of a primary chamber adapted to receive and hold a plurality of dry sensitive plates Z, a device E for removing the plates *seriatim* from said chamber, a follower C kept up to the back of the plates by a spring or springs for feeding said plates up to the front of the said chamber, and within range of the action of the said removing device, and a second chamber adapted to receive and hold the said plates as they are passed from the said primary chamber after exposure, the floor of the said primary chamber being arranged above the level of the floor of the said secondary chamber, all substantially as set forth.

5. In a photographic camera in which the plates, after exposure, are passed in succession from one chamber to another as described, the mechanism herein described for effecting the passage of said plates from the one chamber to the other, said mechanism consisting of a frame E, having provisions *c* for raising the said plate, and provision for pressing down said plate, a curb F, over and down which the plates are moved, and a spring or springs M for pressing the plates over the said curb, arranged and operating substantially as set forth.

6. In a photographic camera of the type herein described, the combination of a shutter K interposed between the lens of the camera and the set of plates Z, whereby the light rays from the front portion of the camera are admitted to or excluded from the plate chamber and depository chamber, substantially as and for the purposes set forth.

7. In a camera of the type herein described the combination of a flexible portion interposed between and connecting the plate chamber and the depository chamber, substantially as and for the purposes set forth.

8. The combination with a camera in which a plurality of plates, films, or other equivalent media are used and moved *seriatim* from one chamber to another as described, of a device by which the plates in the depository chamber are held in position when the camera is placed on its side in the act of taking a photograph, operating substantially as set forth.

9. The combination with a photographic sensitive plate of a backing of paper or other suitable material, substantially as and for the purposes set forth.

Patents stated in the Official Journal to have become Void by Non-payment of Duty. Non-payment of Fourth Year's Fee.

8,771 of 1884. H. J. SHAWCROSS.—Treatment of Sensitive Paper.

8,852 of 1884. F. W. BRANSON.—Photographic Apparatus.

## Rebichs.

LA PHOTOGRAPHIE INSTANTANÉE, SON APPLICATION AUX ARTS ET AUX SCIENCES. Par Dr. J. M. Eder; traduction française par O. Campo. Large octavo; 221 pages. Price 10f. (Paris, 1888: Gauthier-Villars, Quai des Grands Augustins 55).

We have here a very profusely illustrated work, showing what can be done in the way of instantaneous photography, and in it are reproduced all the most striking examples of instantaneous work which have been published since the advent of the gelatino-bromide dry process.

## Proceedings of Societies.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The ordinary weekly meeting was held on the 20th inst.; J. J. BRIGINSHAW occupied the chair.

A. COWAN exhibited a frame of transparencies, the outcome of some experiments he had recently been making with hydroquinone—used as a developer for chloride plates. He had found it gave excellent results, and was very quick. Any degree of density could be obtained. He gave the formula he used:—

Hydroquinone	...	...	...	2 grains
Carb. soda or pot.	...	...	10 to 40	"
Sulphite soda	...	...	10	"

to each ounce of water, adding  $\frac{1}{10}$ th of a grain of bromide of potassium—the latter being necessary to keep the shadows perfectly clear. Common washing soda might be used. He had developed upwards of sixty plates in the same solution. Any degree of warmth of tone could be obtained with the various alkalies, carb. of ammonia giving by transmitted light a rich red colour. Any discolouration of the plate was easily removed with a weak solution of acid. All the slides shown had been developed without turning the gas down. Perchloride of iron could not be used for reduction, as it took out all the colour of the image.

W. H. PRESTWICH showed a model of a shutter that he had recently made. It consisted of a cylinder, at one end of which a hollow ball revolved on a pivot; a diamond-shaped aperture pierced through the ball gave a rapid exposure with half a revolution of the ball. The merits of the various shutters in the market were then discussed.

A. HADDON remarked that with regard to the prevention of vibration in exposing, a great deal depended upon the construction of the camera and a firm stand.

The CHAIRMAN said a great advantage with a shutter was being able to give a time exposure.

A question from the box was read—"Will any member give a formula for making carbon tissue that he has found to be successful?"

A. COWAN thought it would be much cheaper to buy it ready made. It was not easy to prepare on a small scale.

The CHAIRMAN thought in some cases that the ordinary sources of supply might not be available. He had prepared carbon tissue from a formula taken from Dr. Liesegang's "Manual of Carbon Printing," the only difficulty he found being the stripping of the tissue from the glass plate, although every care had been taken to insure the surface of the glass being perfectly clean; the glass plate having first been washed in dilute nitric acid, then with potash, and, while wet, rubbed over with ox-gall.

A. COWAN suggested a final polish with powdered talc.

J. T. LEMON, of Winchester, showed an enlargement painted in oils.

T. E. Freshwater was elected a member of the Association.

On Thursday, October 4th (Ladies' Night), there will be an exhibition of photographs taken during the Birmingham Convention. Visitors are invited.

### NORTH LONDON PHOTOGRAPHIC SOCIETY.

An ordinary meeting was held on Tuesday, September 18th, J. TRAILL TAYLOR in the chair.

The President passed round some remarkably good portraits



sent to him by Mr. McCollin, of Philadelphia. They were taken by the light of a magnesium compound of his own preparation, which he had named "Blitz-pulver."

L. MEDLAND showed a number of amusing instantaneous pictures taken at Barnet Fair and elsewhere.

J. CARPENTER showed some prints on Pizzighelli paper, with which he expressed himself much pleased. Although the prints shown were the results of a first trial of the process, they were quite satisfactory.

C. FOX exhibited a number of very successful instantaneous views taken in the neighbourhood of Brighton.

JOHN JACKSON showed and explained the Kodak camera, and passed round a number of enlargements, which abundantly testified to the practical value of the apparatus.

The PRESIDENT opened the discussion on "Mounting and Finishing Prints," by remarking that a good mountant was the first desideratum. The mountant most generally used was starch, which, when properly made, and used fresh, left little to be desired; many of the larger firms, however, and professional mounters preferred glue, to which a little sugar was sometimes added. After mounting, a waxy compound known as "eucastic paste" was rubbed over the print, and, if carefully done, much enhanced the appearance of the work. This finish was introduced by the late M. Adam Salomon, who used a very complex mixture for the purpose. Ordinary white wax dissolved in turpentine and applied with a tuft of cotton wool answered perfectly, and was the eucastic paste in general use. When it was desirable to mount prints on paper or very thin card, there was a marked inclination to cockle and twist the mount. To obviate this, a mountant containing little or no water should be used—india-rubber dissolved in benzole, or gelatine with the smallest quantity of water diluted till sufficiently thin for use with alcohol, answered well. What was known as the dry process of mounting was also useful, and entirely avoided curling of the mounts. The wet print was starched on the back as usual, and allowed to dry; when the print was dry, a mount was taken and damped with a sponge, the print adjusted upon it, and the whole immediately passed through a rolling press, the print thus being firmly attached to the mount before either had time to expand. The credit for introducing this method was due to M. Disderi. Where a very fine finish was desired, recourse must be had to enamelling. To effect this, a collodion containing six grains of pyroxiline to the ounce was poured on to a glass plate, as for the negative process, the prints to be glazed were then immersed in a warm gelatine solution and immediately squeegeed down on to the collodion film; when dry a penknife was inserted under one corner, and the print stripped off. The surface thus obtained was equal to that of the glass plate used, all scratches and other inequalities being faithfully reproduced in a reversed form.

A. MACKIE said that the india-rubber solution sold for mounting was a delusion and a snare. The prints mounted easily, and for a time appeared entirely satisfactory, but, after the lapse of a few months, or even weeks, they could be stripped off with the greatest of ease, the india-rubber having entirely decomposed. He much preferred the solution of gelatine in alcohol. A writer in "The British Journal Photographic Almanac" recommended an alcoholic solution of shellac in alcohol for mounting. It would be interesting to try this, though he feared the manipulations would be somewhat difficult.

E. CLIFTON described various methods he used for facilitating the trimming of prints, and deprecated the system of cutting prints to standard sizes irrespective of subject. He had found the American trimmer useful for cutting wet prints.

Mr. JACKSON said that wet prints could be cut with a sharp knife if done quickly.

Mr. BISHOP had failed to obtain satisfactory results with the dry mounting process. He found that portions of the moistened mount adhered to the roller of the press. He now starched the wet prints as for "dry" mounting, and re-starched them, and mounted quickly before the print had time to expand. Mr. Bishop passed round some prints mounted in this manner, and they were quite flat. He said that prints mounted in this way were free from the distortion caused by the unequal expansion of the paper. In continuation of his remarks on optical contact mounting, he said that good results could be obtained if the glass and print were both warmed, and a pool of gelatine solution (fifteen grains to the ounce) poured on the centre of the plate, the print was then squeegeed down in the usual way. This plan obviated the preparation of a large quantity of gelatine when only a few prints were to be mounted.

Mr. MEDLAND said that he found that a small quantity of sugar to increase the adhesiveness of starch paste. Fish glue was useful for fastening down edges which had curled up after drying.

J. OAKLEY said that he had found the same objection to "dry" mounting that Mr. Bishop had; it spoiled the mounts. He now used gelatine and alcohol.

A. MACKIE described a handy method of centering prints on mounts giving a wide margin. A spoilt mount of the size in use was taken, and an opening rather larger than the print cut in it; the print having been pasted, the cut-out mount was laid over it, and the position adjusted; the mount for the picture was then laid down, so that the edges registered with the guide mount, when the print attached itself and was ready to be rubbed down.

Mr. BISHOP said that he found an old razor the best instrument for trimming prints.

Mr. MACKIE said that clock spring made excellent print cutting knives. It was ground to an edge diagonally, and fixed in a wooden or strug handle.

It was announced that at the next meeting, on October 2nd, H. M. Smith, late Hon. Secretary, would give a demonstration of "Enlarging," when he would use a very large and perfect apparatus.

#### COVENTRY AND MIDLAND PHOTOGRAPHIC SOCIETY.

A SPECIAL general meeting of this Society was held on Sept. 19th, President ANDREWS in the chair, and there was a considerable attendance of members.

A. Carter and W. D. Welford were elected members of the Society.

The revision of certain of the rules was then proceeded with. It was explained that the annual meeting under the old rules took place after the photographic annuals had gone to press, and it was unanimously decided to hold the meeting for the election of officers in November instead of December, so that they might contain a correct list.

After the conclusion of the business, an interesting discussion took place on the relative merits of different developers and the methods of applying them.

#### WEST SURREY AMATEUR PHOTOGRAPHIC SOCIETY.

At the meeting of this Society held on Monday, September 24th, the President, J. GALE, read a paper on "Landscape and Clouds." T. WINSFORD occupied the chair.

The address (which was illustrated by reference to a series of Mr. Gale's well-known lantern slides shown on a screen) will be given next week.

The actual methods of registering and masking out used by the lecturer in printing in clouds were shown in detail.

In the discussion which followed, G. DAVISON held that truth to nature was the consideration to be regarded in printing in clouds. On the faithfulness with which a beautiful effect in nature was reproduced depended the impression it produced on the mind. The objection which was taken to all combination printing by some did not appear to him so absurd or so untenable a position as maintained by Mr. Gale. It could hardly be expected that perfect truth and coincidence of lighting would be obtainable, when clouds and landscapes taken under different circumstances and at various times were combined. Of course, the same contention would have to apply to paintings which were not painted throughout in front of the scene depicted, but were partly invented in the studio. Mr. Gale was no doubt correct in saying that at present there was nothing left but to print in clouds from separate negatives; for, even if methods were used to obtain the sky in the same negative as the landscape, it was by no means certain that truth of tone would be obtained. Orthochromatic plates might and ought to be invaluable here, but they hardly seemed to be trusted yet. Sensationalism in clouds was objectionable. A strongly marked effect was often introduced where only blue sky had been seen in the landscape; it was better merely to sun down the print to the proper tint required to render the sky in true tone with the rest of the picture.

In the course of the evening the different methods and means used in cloud printing were discussed, such as waxed paper negatives, the use of films as cloud negatives, the use of special sky shutters; special printing frames, hand-made clouds on back



of negative, either stumped on varnish or on tissue paper with lead pencil, or dabbed on in Indian ink with finger or wash-leather.

Leik's patent sky-shutter and some ingenious frames adapted to facilitate correct registering in cloud printing were exhibited. These had been kindly lent by Messrs Mariin and Co. Pictures on the printing-out platinum paper were shown by Mr. Faulkner, and enlargements from quarter-plate negatives up to about 18 by 14 by Mr. Squire.

## Talk in the Studio.

SIR JOHN LUBBOCK ON PORTRAITURE AMONG SAVAGES.—In a lecture delivered recently at Bath, and quoted in the *Scientific News*, Sir John Lubbock says:—"Another curious idea, very prevalent among savages, is their dread of having their portraits taken. The better the likeness, the worse they think for the sitter; so much life could not be put into the copy except at the expense of the original. Once, when a good deal annoyed by some Indians, Kane got rid of them instantly by threatening to draw them if they remained. Catlin tells an amusing but melancholy anecdote in illustration of this feeling among the same people. On one occasion he was making a likeness of a chief named Mahtocheega in profile. This, when observed, excited much commotion among the Indians. 'Why was half his face left out?' they asked; 'Mahtocheega was never afraid to look a white man in the face.' Mahtocheega himself does not seem to have taken any offence, but Shonka, a hostile chief, took occasion to taunt him. 'The Englishman,' he said, 'knows that you are but half a man; he has painted but one half of your face, and knows that the rest is good for nothing.' This taunt led to a fight, in which poor Mahtocheega was killed, and the whole affair was very unfortunate for Mr. Catlin, who had much difficulty in making his escape, and lived some time in fear of his life; nor was the matter ended until both Shonka and his brother had been killed in revenge for the death of Mahtocheega."

THE NEW COLORADO OBSERVATORY.—Speaking of this, the *Detroit Free Press* remarks:—"The Lick Observatory is soon to have a rival nearly 1,000 feet higher than Mount Hamilton, and situated in Colorado, at an elevation of 5,000 feet above sea level. Mr. II. B. Chamberlin, of Denver, provides the funds for its erection; and the main instrument will be a twenty-inch telescope, a size quite sufficient for nineteen-twentieths of all astronomical work, and much less unwieldy than the great Lick telescope with a thirty-six inch lens, and a tube nearly sixty feet long. The new Observatory will be attached to the University of Denver, and its director will be Professor H. A. Howe, formerly of Cincinnati, who is now in the Eastern States on a tour of inspection of the principal observatories before building his own."

CARDIFF AMATEUR PHOTOGRAPHIC SOCIETY.—The forthcoming Exhibition of this Society is to be held at the Town Hall, Cardiff, from Oct. 22nd to 27th, and the Mayor of Cardiff has promised to open the Exhibition in person. Applications for space have been made by so many of the leading professional and amateur photographers as to give good hope of an excellent show. Medals and certificates of merit will be awarded. A special feature in connection with the undertaking is the Champion Class, open solely for pictures that have taken prizes at any previous exhibition; pictures that may secure medals on this occasion will also be eligible to compete in this class. The Hon. Sec., G. H. Bedford, of 127, Bute Road, Cardiff, will receive applications for space up to and including the 5th October.

THE LATE SOLAR ECLIPSE.—*Anthony's Bulletin* says:—"From Professor W. H. Pickering we have received reports of observations on the total eclipse of the sun at the Island of Grenada, West Indies, and also of the total eclipse of the moon, January 28th last. They are full of interesting observations in scientific photography, and we are sorry that we cannot enter more into details about them. The photometric and spectroscopic work during the sun's eclipse is highly interesting, and should be read by all those working in this domain of astronomy. As usual with all the work from the Harvard Observatory, these monographs are well illustrated."

THE INTERNATIONAL PHOTOGRAPHIC EXHIBITION IN VIENNA.—The opening is postponed until Oct. 1st, and it will close on November 4th. The Archduchess Maria Theresa, the patroness

of the exhibition, has consented to open it in person, and has also promised a medal, which is to be called after her. There are over 200 exhibitors. Many European countries will be represented.

PHOTOGRAPHIC CLUB.—The subject for discussion on Oct. 3rd will be "Photo-Micrography," with a demonstration by T. Charters White; visitors invited. Saturday outing at Hampstead; meet afterwards at "Bull and Bush." With respect to the time of the Photographic Exhibition, the Secretary writes as follows:—"During the exhibition of the Photographic Society, the members of the Photographic Club will be pleased to see as visitors any gentlemen who may have come to London for this purpose. Short papers will be read, and discussion is invited."

## To Correspondents.

\*. Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER AND CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

J. E.—The only thing we can suggest is to get a plating maker to purchase them; but unless you have a considerable quantity it will not be worth his while.

J. E. KEMP.—Thanks very much for the note, which we shall use. MEDICUS.—1. Nine thousand six hundred grains. 2. One thousand six hundred grains. 3. Eighty ounces.

J. W. BEAUFORT.—Your letter shall be inserted if you will have your name attached to it.

R. CHILD BAYLEY.—Thank you for your communication.

AN ARTIST.—We cannot tell you where the published account can be obtained, but doubtless an official copy will shortly be issued.

N. W.—The cost is very small—under two shillings—and the work of registration is undertaken by Piper and Carter, the publishers of the PHOTOGRAPHIC NEWS. If you send them 2d. in stamps, they will send you the form to be filled up, and also further particulars.

S. J. M.—You had better not charge more than your ordinary rates, as the department in question knows very well what ought to be paid. Probably they will require the negatives and one print from each.

"MOST MAKERS OF DRY PLATES."—The author of a paper which begins thus, and has been sent to us, is requested to tell us his name, and what title he proposes for his paper.

CHARLES LAMBERT.—1. Gum-arabic is the medium most usually employed, although some prefer to use thin glue—glue of a very cheap and common sort is best. 2. In this case a gelatine very free from putrescent substances is required, and yet one which is very easily soluble. Obtain the soluble "soup gelatine" of Nelson, Dale, and Co., of Dowgate Hill, Cannon Street, London. 3. One-sixth of bichromate of ammonium is sufficient. 4. The presence of the insoluble silver salts (iodide, &c.) was supposed to influence the grain, but we never satisfied ourselves of the truth of this supposition.

THOMAS L.—D.—Polish the face of the steel bar by carefully rubbing down on a good and level oilstone, or take it to a mechanic and get it done. Probably they will undertake the work at one of Buck's tool shops (Tottenham Court Road, or Waterloo Road).

M. R. S.—If you wish to purchase a lens specially for the work, obtain that second on your list; but we think the instrument you possess is so well suited for it that there is not much need to get a fresh one.

## The Photographic News.

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# THE PHOTOGRAPHIC NEWS.

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### THE PHOTOGRAPHIC EXHIBITION.

EVEN if the Exhibition of the Photographic Society of Great Britain, which was opened on Monday, had proved to be considerably below the average of excellence, and if it had also been deficient as to the number of exhibits, it would not by any means follow that the Council had taken an unwise step in deciding to award no medals, for the result of a change is not always to be judged by its first results; the immediately disruptive effect having to be taken into account. But as a matter of fact, not only is there no falling off in quality, but a distinct gain as regards the average of excellence, a large proportion of the commercialist or show-case element (part photograph, part work of manipulative cunning) having been eliminated, as indeed it was hoped would be the case; for the main inducement to send such productions would appear to be that the show-case or window may in future be baited with medals.

The commercialist portrait, with face retouched out of all likeness to any countenance that God ever created, is not altogether absent—indeed, it would be a wonder if it were entirely absent; but it is comparatively scarce. On the other hand, we have some specimens of portraiture so good that no artist need be ashamed of having made them. Perhaps the very best portraits in the room are three rather small platinotypes by Robert Faulkner, contained in frame No. 379. The sitters are J. Q. Wetherlee, Colonel Colville, and Lieut.-General Sir Dighton Probyn. The attitudes are reposeful, natural, and indicative of no effort on the part of the photographer to obtain what is called “effect;” this quality in a photographic portrait—and, indeed, often in painted portraits—being merely a random striving after some pose or quality which shall make the portrait remarkable. Those who wish to see what a photographic portrait may be, should not fail to see Faulkner’s frame, No. 379. Faulkner has hardly been so successful with the three portraits in the adjacent frame, No. 380, but we must recognise that women-folk are far more difficult subjects than men, as they seem to have an instinctive yearning after “effect” in their portraits.

Another very meritorious specimen of portraiture is No. 399, William Morris, by Elliott and Sons, in which the ordinary characteristics of the face of the poet and the scholar are well realised; and we think it a very much better portrait than No. 418, a painted portrait of the same by Watts, and reproduced in platinotype by Fred Hollyer. It is curious to notice in this latter, but not in the photographic portrait, many of the facial characteristics of Morris’s eldest daughter, whose portrait is to be seen as the principal figure in E. Burne-Jones’ “Golden Stairs;” this picture, reproduced as a platinotype by Hollyer, being placed quite close to No. 418,

As a contrast with the portraits we have mentioned, we may refer to an enlargement by Warwick Brooks (No. 386), in which “effect” is obtained in a full-length portrait of a woman by twisting the body—by no means an uncommon device. Perhaps out of some spirit of calling by contraries, this production is called “Meditation”—just as if any woman could or would meditate in such a position.

Landscape photography is well represented, and the general standard is high. We may especially mention W. Wainwright’s admirable series of four views of Lake Derwentwater (No. 289); Andree’s Berkshire views (No. 347), although these would have been much better had all the skies been let alone; Mrs. Main’s magnificent scenes of mountain and cloud in Switzerland; the delightful series of views in the Low Countries (Nos. 462 and 463) by Robinson and Thompson; and Horace W. Gridley’s exceptionally interesting series showing the ruins of Palmyra—although this latter series possesses far more interest from the historical and antiquarian point of view than from the pictorial side. W. K. Burton’s photographs of scenes of the recent volcanic eruptions in Japan (reproduced in the PHOTOGRAPHIC NEWS last week) are also to be found in the Pall Mall collection.

We shall say more about the Exhibition next week.

### THE EXHIBITION OF THE ARTS AND CRAFTS SOCIETY.

“THE true root and basis of all art lies in the handicrafts,” says Walter Crane in his preface to the catalogue of the remarkable Exhibition which was opened in the New Gallery, Regent Street, on Monday last; and he continues, “if there is no room or chance of recognition for really artistic power and feeling in design and craftsmanship, if art is not recognized in the humblest object and material, and felt to be as valuable, in its own way, as the more highly rewarded pictorial skill, the arts cannot be in a sound condition; and if artists cease to be found among the crafts, there is great danger that they will vanish from the arts also, and become manufacturers and salesmen instead.” Further, it is held by those who are attempting to lead the present day reaction against commercialism, that he who, having a free hand, makes a thing which he desires to have, will infuse into that article some of his own personality, and, whether in the direction of beauty or of ugliness, the work will reflect the man. Moreover, it is only by encouraging the personalness of work that there is hope of men becoming widely imbued with a general perception of the beautiful. The man who makes for sale to meet a prevailing taste, tends by his actions to emphasize that taste; till at last it grows into a distinct convention; but if the craftsman who merely constructs for sale tends to create a convention, how much



greater is the tendency under the manufacturing system, where the capitalist causes the workmen to only make that which will be accepted on the market, and under which system the worker is almost brought to the condition of a machine. Under this system things which will sell are mainly made, and then things which will sell are those which are characterised by those qualities which appeal to the least cultured intellects. So the world is flooded with the very worst form and kind, while the taste is strengthened.

Corrupt taste has now taken the form of a constant hunger after "novelty," so the manufacturer has to put on the market a constant stream of variation, each one of which is of the degraded type now acceptable to the bulk of the purchasing public. "Novelty rather than improvement is the rock on which our craftsmen are but too often wrecked," is very truly remarked by Somers Clark in his introductory notice on "Table Glass;" and again, it may be worth while noting what William Morris has to say on the subject of the influence of modern improvements on the art crafts. Morris says, "There has been no improvement (indeed, as to the main processes, no change) in the manufacture of the wares in all these branches since the fourteenth century, as far as the wares themselves are concerned; whatever improvements have been introduced have been purely commercial, and have had to do merely with reducing the cost of production; nay, more, the commercial improvements have on the whole been decidedly injurious to the quality of the wares themselves."

The aims of the committee of the Arts and Crafts Exhibition are to work in the direction of emancipating the craftsman from the corrupting influence of commercialism, and to encourage the development of the true perception of beauty. The means taken towards this are the exhibition of results, and the organisation of a series of lectures, which are to take place in the Gallery on certain evenings not yet fixed upon. Certainly not much towards realising so great an end, but a beginning. Even the immediate purpose to show every exhibit under the name of the craftsman has not been realised in every instance, the difficulty of finding the actual worker having proved insurmountable in several instances; to say nothing of the fact that in numerous instances many craftsmen have worked on the same object.

Perhaps one of the finest exhibits is a piece of Arras tapestry, woven in the high warp loom; in which the "Beasts of the Field" are shown. The "Beasts" are from drawings made by Philip Webb, and these drawings were photographed, after which a draughtsman sketched the whole subject on full scale, and from these sketches the weavers (Charles Knight and John Sleath) worked; the sketch being behind the weaver, who views it in a mirror, an arrangement necessitated by the fact that the weavers work at the back of the fabric. This fine work is exhibited by Morris and Company.

Photography takes a large but indirect part in the Exhibition of the Arts and Crafts Society. Not only do we find photography taking the part of a transcriber—as instanced in the case just mentioned—but we find photographs themselves on exhibition, as those (No. 127) of the interior of Llanvair Kilgeddin Church, and intended as illustrations of the interior treatment; or the extensive series of photographs of work by E. Burne-Jones, and including his mosaics in the American Church of St. Paul at Rome. We also find decorative work in which the colour in manner of a photograph is followed—as, for example, in the fine panel (view of Groningen, No. 33) contributed by Arthur B. Donaldson.

We intend to say more about the Arts and Crafts Exhibition, but in the meantime would suggest that those who visit the Photographic Exhibition will have to walk only a short distance in order to study the new departure organized by the committee of the Arts and Crafts Society.

## PHOTOGRAPHERS AND DEALERS.

BIDDLE v. FRY & Co., LIMITED.—IMPORTANT ACTION.

We give below a full report of the important action tried on Friday, at the Dartford County Court, before Mr. Homersham Cox.

It will be seen that of the three questions put to the jury two have been answered in the plaintiff's favour, and one in favour of the defendant; but as judgment has not yet been entered, the case is, to some extent, still *sub judice*. Whatever this judgment may be, the result is certain to have a strong influence upon the relations between dealer and photographer. Hitherto that vague factor, the custom of the trade, has ruled these relations, and for more than a quarter of a century, photographers have been content to buy goods relying upon the good faith of the dealer who supplied them. To take the matter under discussion, for instance. Mounts sold in the ordinary way have always been bought in the belief that they were suitable for using with a starch mountant. Every photographer has been in the habit of employing starch; so much so that if a customer were to ask a dealer whether certain mounts were suitable for starch he would be almost ridiculed. Manufacturers, therefore, know the requirements of photographers as well as photographers themselves, and in selling mounts they sell them with the full knowledge that starch may be used. Of course this assertion, like every other assertion under the sun, may be met with a quibble, but all practical men know that it is absolutely correct. If, therefore, some manufacturer, either to make his goods look better, or to undersell his competitors, introduces certain materials which render these goods unfit to be used in the ordinary way of trade, then he is bound either to give directions as to their specific manipulation, or take the consequences.

This, we contend, is the broad issue of the action of Biddle v. Fry. Photographers who understand the technical points involved in the case—which we submit, with all proper deference, the judge in his summing-up did not quite grasp—will not be misled by the confusion which the counsel for the defence sought to introduce. Naturally he sought to prove that the defects were caused by anything or everything except by the colouring of the cards, and we do not find fault with him for doing the best he could for his client. But the extreme complexity of the general term "fading" is not to be settled by the *ipse dixit* of any number of witnesses, and in view of the evidence given by Mr. Spiller may be dismissed as beside the mark. We do not care whether the colouring matter was magenta or any other dye. The fact was conclusively proved that it was soluble in water, Mr. Fry himself admitting that it was more easily removed than other colours. It only needs the merest smattering of photographic knowledge to understand that a soluble dye of this kind is not fit to be used in conjunction with starch. Mr. Biddle was not warned that starch was not fit, or that it should be made in any special way. Mr. Fry observed that "any mountant might be used which would effect its purpose." We do not profess to be able to interpret this somewhat oracular answer, but it may be noted that Mr. Fry did not venture to assert that the mounts could not be used with starch as ordinarily employed. That the jury adopted a right conclusion in saying that the mounts were not reasonably fit for use, if proper care were used, admits of little doubt.

One important point brought out needs little emphasis. As in the case of Downes v. Fallowfield, so in this case, the fact was elicited that the mounts were of German manufacture. Probably the German makes are cheaper in the first instance than English ones, and so are patronised. If this be the reason, it is also pretty clear that in the end they are much dearer. In Mr. Downes' case the German makers were convicted of carelessness; in Mr. Biddle's case the jury have declared that these goods are not fit for the purpose for which they are sold. After



this we fancy that photographers will do well to avoid German mounts for the future.

*Mr. Ridley*, who appeared for plaintiff, stated that *Mr. Biddle*, who was a photographer carrying on business in High Street, Dartford, claimed damages to the amount of £40 by reason of the defective quality of photographic mounts supplied by the defendant company. He also claimed £6 3s., being the amount actually paid to the defendants for the mounts in question. Some of the mounts supplied were of an olive green colour, and some of a chocolate tint, and it was of the latter that complaint was made. The defendant issued a circular—

*Mr. Newson* (for defendants) : I must object.

*Mr. Ridley* : I do not propose to read it. I will simply say that if a man sells an article to be used for a particular purpose there is an implied warranty that this article is reasonably fit for the purpose for which it is sold, and *Fry and Co.*, in selling their photographic mounts, in effect warranted them as fit to be used for photographic purposes. The goods were ordered in May, 1887, and delivered, but were not used until May, 1888, *Mr. Biddle* having had a stock of mounts which he had been working out. Between May and July, 1888, *Mr. Biddle* used and circulated among his customers between 700 and 800 photographs mounted upon the chocolate coloured mounts, and during that time it was discovered that, in the process of mounting, red stains appeared on the photographs. It did not then occur to him that the stains might be due to the mounts, and he floated off the photographs with a view to remounting them. But he found, when the prints were removed, that they were stained completely through with colouring matter, and their value destroyed. He had consequently to print them over again. This went on till July, when *Mr. Biddle* was struck with the fact that the photographs mounted only on the chocolate mounts were spoiled and were fading; those mounted on the olive-tinted cards remaining perfect. He discontinued using the mounts, and the serious position he was placed in not striking him, he wrote a letter to the defendants, thinking that all he had to do was to return the mounts, and there would be an end of the matter. He therefore wrote the following letter :—

73, High Street, Dartford.

To Messrs. *Fry & Co.*, Kingston, S.W.

GENTLEMEN,—I this day return by *S. E. R.* a box containing 1,250 Cabinet, and 1,600 C.-D.-V. chocolate mounts, manufactured by your firm some months ago. The mounts are found to be totally unfit to mount photographs upon, owing to a soluble red colouring matter which permeates the photographs or prints, causing marks and patches to come through, and the whole photograph fading quickly upon them. I claim firstly, the amount charged for the mounts, viz., £6 3s., or the equivalent in olive-coloured mounts, the same as those supplied with these chocolate ones. I claim secondly, £10 for damage to reputation and business by fading of photos, delay, and inconvenience and loss accruing by time and material used in producing prints of which a number were mounted on these chocolate mounts, the same photos being spoiled. The fact of these mounts being unfit for use only came to my knowledge some few weeks since, and we have made every effort to use them (the mounts we had in stock having lasted up till that time, with the olive ones supplied at same time, which were found to be satisfactory). You will observe the justness and smallness of the amount claimed, as compared with damage and losses enumerated above.—Yours respectfully,

T. K. BIDDLE.

July 12, 1888.

To this the defendants replied as follows :—

Southsea Road, Kingston-on-Thames.

To Mr. T. K. BIDDLE, Dartford.

DEAR SIR,—We beg to acknowledge receipt of your letter of the 12th inst., but distinctly repudiate any claim in the matter. The goods were supplied to your order thirteen months ago, and paid for by you without protest. We decline, moreover, to admit the correctness of your statement, and in any case complaint should have been made within a reasonable time after delivery. We may mention that among the many thousand of

similar mounts sent out by us, we have not had reported to us a single instance of the kind upon which you found your complaint. We have refused the case from the Railway Company.—Yours truly,

S. FRY & CO., LIMITED.

July 16th, 1888.

Upon this, the plaintiff sent a number of mounts to *Mr. John Spiller* to be analysed, and *Mr. Spiller* was prepared to go into the witness-box and demonstrate practically, if it was thought desirable, the fact that beyond all question some soluble red colouring matter was used in the manufacture of the cards which rendered them unfit for the purpose for which they were sold.

A number of the photographs complained of were handed up to the judge and jury, and *Mr. Biddle* was then examined, his evidence corroborating the opening statement of his counsel.

In the course of further examination, plaintiff said there was no difference made in process of mounting between the olive green and the chocolate mounts. Starch paste only was used. When put into water, the prints floated off easily.

*Mr. Newson* : It was an extraordinary thing to put them in water, was it not ?

*Witness* : No ; I have endeavoured to float some off the olive green cards, but they did not come off so readily, and in some cases would not come off at all. Some of the photographs had been placed in the shop and in the window, and about the 7th of July I noticed that those on the chocolate mounts had faded considerably.

Cross-Examination continued : He had had complaints from his customers, and had reproduced something like 200 photographs, having about 700 still in circulation. His business would be affected by the circulation of these photographs, which he certainly would not have sent out in the condition they now were. The actual cost of reproducing the photographs was between £3 and £4. Photographs were being returned nearly every day. He reproduced them without making any charge. Was not aware that the trade price for reproduction was 2s. 6d. per dozen. There was no general trade price, except for printing for amateurs.

After some questions as to the particulars of photographs supplied to customers and returned by them, *Mr. Biddle* explaining there had been a great difficulty in getting the photographs back as many had been sent abroad, *Mr. Newson* enquired whether it was not well known that chocolate mounts were more difficult to manage than mounts of other colours ?

*Plaintiff* : I was not aware of it.

Cross-Examination (continued) : Do you ever study the PHOTOGRAPHIC NEWS ?—Yes, I read it. Have you noticed the discussion with regard to chocolate mounts ?—No.

*The Judge* : Is this a periodical ?

*Mr. Ridley* : Yes. I will put it in if necessary.

*Mr. Newson* : As to the photographs immersed in water, would you not have been astonished if, after immersing the photograph in water, and keeping it there, the colour did not come from the mount ?—I should expect it to do so to an extent, but not to the extent it did.

*Plaintiff*, in reply to further questions, said the window in which one of the photographs was exposed had the sun on it in the early morning only. It looked north. He was not aware that defects might be caused by using paper too thin. Fresh starch was always made for every batch of prints. He had never had defects arising from improper washing or fixing, or the use of bad chemicals.

*By the Judge* : Defects might arise from these causes.

*By Mr. Newson* : His charge for cartes-de-visite were from six shillings to eight shillings. It was not a low price, but a fair price.

*Mr. Newson* : When you charge six shillings, you cannot devote the same time as to washing ?—Oh yes, I can. Did you not test the cards when you received them ?—I kept them in stock until I wanted to use them. Where were they stored ?—In a dry store room in the centre of



the house. They would not be liable to be injured by keeping for twelve months?—Not at all.

Further on plaintiff said the reason why he did not communicate with Fry and Co. at once was because he thought he would try and use them by employing a drier mountant. He believed it was considered better to use gelatine rather than starch, but he had never tried it himself beyond experimenting. After the stains had been discovered by his mounter, he did the mounting himself. It was not impossible that the marks could have been produced by the brush, but it was very improbable.

Re-examined: He discovered the stains before July. The prints had never been exposed to sunlight. He never had complaints from customers before he used the cards complained of. He had had spoilt prints, but had never before had failures from mounting.

Mr. James Cann, pharmaceutical chemist, said he had had some photographs taken by Mr. Biddle. The photograph produced was taken on Whitsun Monday, and had been kept in an album, and not exposed to light. It had faded considerably. He had given several of these photographs away, but had got one back, and this also showed signs of fading.

By the Judge: As a chemist he could not say what the pigment was, because he had not analysed it. He only knew that the photograph on the chocolate had faded, while one on the green had not.

Mr. Brown gave similar evidence as to photographs with which Mr. Biddle had supplied him. Plaintiff had not asked him to return them.

Miss Eleanor Blackman, in the employ of Mr. Biddle, said she mounted photographs on both the green and the chocolate cards. There was no difference in the mounting.

By Mr. Newson: She had not been told to use anything but starch. She had never mounted on chocolate cards before. She noticed the stains as the photographs were getting dry. Had never had any other failures in mounting.

Mr. John Spiller said he received from plaintiff specimens of photographs mounted on chocolate mounts supplied by Fry and Co. He also received at the same time some plain cards, and two stained photographs detached from the chocolate mounts, and one unstained detached from an olive green mount. He made an extended series of experiments. One of the photographs mounted he cut in half, and found one-half, when immersed in water, became of a slight pink tone, caused by the colour being brought out from the mount beneath. The other half, when immersed in methylated spirit, became coloured very quickly, and was stained in a marked manner. His impression was that the pigment causing the stain was ordinary magenta. He imagined that this colour was used to impart greater brilliancy to the tint. He had treated other chocolate mounts in the same way, but the colour was insoluble; in the plaintiff's cards the colour "bleeds" out.

Mr. Ridley: From the results of your experiments and experience, do you say the mounts are proper mounts for mounting photographs upon?—If I had a stock of them I should not like to use them.

Why?—Because in the process of time I should expect the red colouring-matter to diffuse itself into the whites of the photographs and injure their brilliancy and purity, thus giving the effect of fading.

May I take it that you think the stains in the photographs may be reasonably attributed to these mounts, which, you say, contain this red soluble matter?—I think so.

Do you think the mounts could have been injured by being kept in stock for twelve months before using?—I cannot imagine it would be so.

The question has been asked as to the paper used. What do you say to that?—Judging from the photographs, I should say it was a very good quality.

Is it of the proper thickness?—I do not mind if I use

thick or thin. I should expect to succeed with the one as well as with the other.

I understand that a common cause of failure is the presence of hyposulphite arising from insufficient washing. Did you find any?—No.

To sum it all up, what do you say is the cause of these faults?—I should say the cause was what I mentioned, the use of an improper pigment.

The Judge: Do you swear that positively?

Witness: That is my belief.

Cross-examined by Mr. Newson: I take it for granted you know the difference, in working, between chocolate and olive green mounts.—I cannot say that one presents more difficulty than does the other.

Is not more care wanted in using chocolate mounts?—I am not aware of it.

Is it not better to use gelatine with chocolate mounts?—I have used starch very largely, and I have used gelatine. In the War Department a mixture of the two is used. Glue and gum are also employed, but I believe the bulk of the profession use starch.

Would it not be safer to use gelatine and gum or glue?—I do not think it would make any difference.

The Judge: Is it not possible these defects might arise from causes other than the one you mentioned?

Witness: I do not think so. I have never seen any defects like these.

Mr. Newson (producing a photograph): What do you say to that photograph?—It is a very good specimen. I should say it was rapidly mounted and quickly dried.

It is the proper thing to dry them at once and get the water out of them?—This card is a little different in colour from those of Mr. Biddle. Will you allow me to test it? The two cards are different, and I should like to test the one you have given me (producing a bottle of methylated spirit).

Mr. Ridley: Please allow them to be tested.

Mr. Newson: No, certainly not. We are not going to have our property spoilt (a laugh). You have no objection to the magenta colour?—Yes, certainly. The paper, by absorbing moisture, takes up the colour and transfers it to the photograph.

The magenta adds to the brilliancy, you say?—Yes, to the eye, but not in effect.

Will you swear it is magenta?—Well, I would rather not swear, but it is certainly a red colour, like magenta. It is decolourised by ammonia, and behaves exactly in the same way.

Pressed on the point, Mr. Spiller said if the counsel insisted upon it, he would swear the colour was magenta.

This completed the plaintiff's case.

Mr. Newson, in opening the defence, said he should contend there was no warranty given by the defendant, and that as the plaintiff had allowed twelve months to elapse before complaining, he had no grounds of action. A person who bought goods in this way took them as he found them. The defendants did not manufacture the cards, which were made in Germany, and when specific goods were received in this way, and sold by the defendants, they were not liable, if they did not warrant them to be of a certain quality. *Caveat emptor* would therefore apply.

The Judge: The case, I think, had better go on to the jury, and be decided on the facts, and the point of *caveat emptor* can be reserved.

Mr. Ridley: I am agreeable to that. I might note that in a case on all fours with this, "Downes v. Fallowfield," the same point was taken, and held to be untenable.

Mr. Newson: The case has not been reported.

Mr. Ridley: Oh yes, it has. It will be found in the PHOTOGRAPHIC NEWS.

Mr. Newson: Oh, we can't take that. We are simply the agent for a foreign manufacturer, and I contend that the action should have been brought against the principal, and not against us. Plaintiff dealt with us as an agent.



*The Judge*: There is no proof of that. But you had better bring your evidence, and address the jury afterwards.

*Mr. Newson* then called the defendant, Mr. S. Herbert Fry, manager of Fry and Co., Limited.

*Witness* said, in reply to Mr. Newson, that the Company bought the cards of a Berlin firm, Berghardt and Diesler.

*Mr. Newson*: Now, what is the arrangement between you and this firm?

*Mr. Ridley*: I must object to this.

*The Judge*: Unless the plaintiff had any notice that any arrangement existed I must allow the objection.

*Mr. Newson*: Did the plaintiff have notice how you got these cards?

*Mr. Ridley*: I am not aware that he did.

Examination continued: There are two or three causes of fading, though to what extent is an open question. It may arise from insufficient fixing or insufficient washing, or it may be the result of both. He believed it was recognised that chocolate was a more moveable colour than any other.

*Mr. Newson*: What would you say would be a proper mountant for chocolate cards?—Any mountant might be used which would effect its purpose (a laugh).

Is there any special care wanted with the mounts?—Yes; the mountant should have as little water as possible.

I take it that these marks are brush marks?—They are apparently brush marks, and their appearance is due to the photographs being improperly fixed or washed, or both. We have used some of the same batch of mounts for our own business purposes, and have supplied them to other customers. Not to dealers, because our business does not lie with dealers. We have never had any complaints of the chocolate mounts from other customers.

*Mr. Newson*: Did you deliver to Mr. Tear 1,000 of each size?

*Mr. Ridley*: I must object to this. You must prove that these cards are similar to those supplied to Mr. Biddle.

*The Witness*: They were out of the same consignment from Berghardt and Diesler.

*Mr. Newson*: Suppose the mounts had been returned in a reasonable time, would you have refused to exchange them?—No, it was the claim for damages that made us fight the case.

*Cross-examined by Mr. Ridley*: Having heard from a preceding witness that the process of mounting on the two cards is the same, do you still contend that the defects are due to the mounting?—Yes.

Then how do you account for marks appearing in one, and not in the other?—We are prepared to admit that there is a greater risk of the colour moving in the chocolate than in any other colour.

Do you recollect one single instance where the attention of the customers has been drawn to the fact of the chocolate mounts requiring more care?—I am not aware that I can.

Do you hold a stock of these cards?—We do not hold a stock of such things. They were made to defendant's order, with his name and address on them.

That is another way of saying you have not got any more like them. Did you send the whole of this batch from Germany to Mr. Biddle?—We perhaps kept back a dozen, and have distributed them all except one or two.

What! distributed cards bearing Mr. Biddle's name?—Yes, as samples. We looked among our samples directly we got his letter, and found this one. (The photograph handed to Mr. Spiller by Mr. Newson.) It was mounted immediately.

You do not say with what it was mounted. Was it mounted in the ordinary way?—I do not know how you want me to answer.

Never mind how I want you to answer. Looking at this photograph (handing it up), would you say that it was a photograph which ought to be sent out?

[The photograph in question showed signs at one corner

of coming off the card, with a view presumably to show that the mountant used was not starch.]

*Witness*: I have seen photographs split right off in burnishing. It is a technical matter altogether.

You do not make these goods, and you are unable to say whether those supplied to Mr. Biddle are identical with those supplied to other customers. You do not know whether they contain the same substance?—No.

Compare the card with that of one of Mr. Biddle's. You say it is the same?—There is a slight difference in the tint.

Does this arise from the slight difference in the colour put into the mount?—I cannot tell. I know nothing about it.

At this point the hearing was adjourned.

#### MONDAY'S PROCEEDINGS.

Mr. King, foreman mounter and enlarger to Fry and Co. (Limited), was called by Mr. Newson, and in answer to questions, said that special care was required in mounting chocolate mounts. He used gelatine. A special kind of starch, made thick, and sugar put into it to keep it, could be used. The defects in the photographs produced were caused, in some instances, by the brush, and in others by insufficient fixing. He should say that no defect in a chocolate mount would cause a photograph to fade. He had mounted on mounts similar to those supplied to Mr. Biddle, but could not swear they were from the same consignment.

Mr. George Joseph Tear, photographer, of Clapham, said he had used both chocolate and olive green mounts, but he had not found it necessary to mount differently. In May, 1887, he purchased some chocolate mounts from the defendant company, but he had not the same complaint to make. Of course he had failures; every photographer had; but he took care never to send them out. He found that starch made a mark, and he had done away with starch and used gelatine. He had seen the photographs produced by the plaintiff, and was of opinion that the defects of the same were chiefly due to improper fixing or improper washing. If a photograph was defective, it ought to be observable within a few hours after mounting. It was a common thing to have failures in photography, and perhaps three or four hundred photographs might be spoilt. The photographs mounted on chocolate which were produced by the defendants, and with which Mr. Spiller could find no fault, had been mounted by his firm. At the time of mounting they did not know for what purpose the photograph was required. He considered Mr. Spiller's method of testing unfair, for the colour would come off any mount if subjected to such a test. He thought the chocolate mounts sold by the defendants were a marketable commodity. The price for reprinting photographs for the trade was 1s. 6d. per doz.

*Cross-examined*: He would not go so far as to say that there was the same soluble matter in the chocolate mounts now produced by the defendant company and those supplied to the plaintiff; but examining the two specimens, he should say they were exactly the same quality.

Mr. Newson then addressed the jury for the defence, speaking as to the question of damage; when His Honour said: I shall tell the jury that there is not a scintilla of evidence that the plaintiff's business has been damaged, and it is quite soon enough for him to come here when it is damaged.

Mr. Newson said he must mention this to show how the plaintiff exaggerated, for within a short time of asking for £10 only, he now advanced to £40; not only that, but he had kept the cards thirteen months without a word of complaint, and it was simply his duty to have tested the mounts as soon as he received them. The plaintiff, however, did not do this; he even continued to use the mounts after he found the stains coming on the pictures. He continued to do this after his mounter had drawn his attention to the defects, and it was only when his



customers complained that he commenced these proceedings against Fry and Co. Even then, however, the defendant company would have taken back the mounts if it had not been for the claim for damages, which, if any, was due to his own act in sending out defective photographs. The plaintiff and Mr. Spiller had both admitted that it was possible that the defects might have been caused by the brush, or by improper washing or improper fixing. On these identical mounts good pictures had been produced, as they saw in Court, and this was the only complaint that had been made to the Company. The jury must therefore return a verdict for the Company unless they were thoroughly satisfied that the marks had been by the defective mounts supplied by Messrs. Fry.

Mr. Ridley, on behalf of the plaintiff, contended that an article sold for a specific purpose implied that it was reasonably fit to be used for that purpose, and if it was not fitted for the purpose for which it was sold, it was not a proper marketable commodity. There had been no evidence that the plaintiff had supplied photographs on the chocolate mounts after he found the stains emanated from the whole of the mounts. As to the allegations of improper skill, it was singular that they had had specimen after specimen there of photographs on the olive green mounts, and that all these specimens were admitted to be free from the defects and blemishes that admittedly existed on the chocolate mounts. With respect to it not being a fair test to float the photographs off, it was singular that the olive green mounts did not give off their colour, whereas the chocolate made the water perfectly red. He submitted that the test of Mr. Spiller was a proper and fair one. The same tests had been applied to the olive-green mounts with a negative result, and with respect to the photographs produced by the defendants which were mounted on chocolate, half-a-minute's examination by the jury would show that there was a great difference in the tint, and he submitted that that difference was caused by the use of different pigments, and the pigment used in the preparation of the mounts supplied to Mr. Biddle was, he submitted, an improper one. As for the mount worked up by Messrs. Tear, one had only to look at it to find that the photograph would not stop on it six weeks. It might be wondered why they had laid their damages at £10; and the reason they had done so was in order that they could bring the action in a County Court, and he wished to point out that it was not the actual cost of re-printing the photographs for which the plaintiff was seeking damages.

The judge then summed up. He said: What you have got to decide is whether the plaintiff is justified in returning goods bought and paid for, and also whether he has sustained any damage. Now I must tell you this: that it requires a very strong case indeed to justify a man returning goods. It would be impossible to carry on business in this country if people could return goods just when they thought proper. Therefore, I say, it required a very strong case indeed to justify the plaintiff in returning the goods. He must prove thoroughly and conclusively that they were not fit for the purpose for which they were sold. If there were two alternatives by which the injuries to the photographs could be accounted for, and one of these alternatives put it down to the improper treatment of the operator, it was then the duty of the jury to decide for the defendant. The first question that you have, then, to decide is, whether the plaintiff has proved conclusively and positively to you that the injuries to the photos. were caused by the mounts. Mr. Spiller himself states that probably they might be due to faults on the part of the plaintiff. Mr. Fry looked through the photos., and said that all the defects in them were caused by improper fixing or improper washing. Mr. King, who mounts 400 photos. a week, says that chocolate mounts require special care, and he also says: "I have examined all the photographs produced by the plaintiff, and the defects are due to improper fixing and washing." Mr. Tear, who has had thirty-two years' experience, says just the

same thing: that there are defects in the photos. undoubtedly, and that they are all due to improper treatment after they came into the plaintiff's possession. You have got all these witnesses, who say that it is the plaintiff's own fault. It seems to be agreed on both sides that these chocolate mounts are more difficult to deal with than any other colours; the colour is more easily moved, but it was not the duty of the defendants to warn photographers. A photographer ought to have known what sort of goods he uses. Eleanor Blackman, who does the plaintiff's mounting, said that she had never mounted chocolate mounts before. We are told that the proper way to use these chocolate mounts is to use either a special preparation of gelatine, or some special preparation of starch and sugar. Well, then, I say that it was the duty of the plaintiffs to employ some person who could exercise the special care required. The questions which I shall leave to you will be these:—

(1) Were the mounts reasonably fit for use if proper care was exercised?

(2) Were the mounts returned in good time?

(3) What damage, if any, has the plaintiff sustained? The plaintiff definitely says, "I cannot say that my business has been affected."

The jury retired, and, on returning into court, gave the following answers to the questions:—

To the first question: No.

To the second question: No.

To the third question: £10.

A question having arisen as to whether the £10 included the £6 3s. claimed by plaintiff for the goods returned, the jury again retired, and, on returning into court, altered the amount to £16 3s.

The Judge being compelled to leave before the jury declared their verdict, judgment was not entered. Application, therefore, will be made for this purpose at the next Court day.

## Review.

PHOTOGRAPHY FOR ALL; AN ELEMENTARY TEXT-BOOK AND INTRODUCTION TO THE ART OF TAKING PHOTOGRAPHS. By W. Jerome Harrison. Crown 8vo., 112 pages. Price 1s. (London, 1888: *Hiffe and Son*, 98, Fleet Street; and *Simpkin, Marshall, and Co.*, Stationers Hall Court.)

FROM the commencement, the photographic student has generally contented himself with learning from a shilling handbook, and the custom continues to the present day; still, if the learner takes the advice of the author of this handbook, "Let every worker subscribe to one of the weekly journals of photography," he may well make up his mind to take the work before us as his tutor.

W. J. Harrison has the power of making his meaning clear with few and well-selected words; and this power, taken with the fact that he is an expert worker as well as an experienced teacher, have led to an excellent result as far as "Photography for All" is concerned. It is concise, comprehensive, accurate, well brought up to date, and provided with a good index.

## ON LANDSCAPE AND CLOUD PHOTOGRAPHY.

BY J. GALE.\*

I HAVE endeavoured to collect together a few scattered ideas on photography, particularly on landscape negatives and cloud negatives, and their combination to produce resulting prints or positives; and I propose, this evening, to limit my remarks hereupon pretty much to the science part of it, as distinct from the artistic; for photography proper is essentially a science, and however well and skilfully—as a recreation and a pastime—it can be turned to account and worked in the direction of art, there is no doubt that science claims photography as almost exclusively its own.

\* Read before the West Surrey Amateur Photographic Society.



Photography is a mechanical process ; it is only to follow out certain formulæ or instructions, and almost perfect work can be done and be repeated to any extent. If we could set about and get the work done by a machine, we should probably have more uniform and perfect results.

In the present aspect of landscape photography (I won't say what may be hereafter the fashion or the practice) we must rely on the sun, our lens and camera, and other mechanical contrivances (with chemistry) to do all the actual work for us. And these we can control, to a large extent, by the application of skill and judgment.

We must let the sun pencil his own rays ; if he is in a good humour, he will do all he is set to do, and it should be our endeavour, with the best means at our command, to direct his rays aright. In this consists the science part of the business.

The art element lies in the direction of the task we set the sun to do. It will be for us to gather together the right material and put it in its proper place—to mould the mouldable part of it into the best form and shape we can—to arrange for the most suitable light to fall upon it ; and this done, we may call on the sun to do his task, and pencil for us, by his rays, what we put before him ; and if we have done our part well and lovingly, and with judgment, he will respond to our call. It will only remain for us to bring to bear a skilful application of the science operations, and, perhaps, the resulting work may go towards making photography an art as well as a science.

In our landscape photographs, particularly when we combine cloud photography, we must take care not to offend, first and foremost, against science and its laws, which are hard and rigorous and unquestionable ; and next against the laws and canons of art and good taste, which, however, are a very variable commodity.

For instance, in printing sunlit clouds from one negative with sunlit landscape from another negative, we must be careful that the source and direction of lighting for the two correspond, or thereabouts ; for we must remember that the lighting of clouds is subject to the same laws as the lighting of a landscape or a building.

Given a sunlit building, it would be easy, by looking at the lighting and the shadows, to point to the position of the sun without seeing it ; so with a landscape ; so also (but less easily, and only by study or careful observation) with sunlit clouds.

I am particular in saying sunlit clouds, for sometimes the clouds as we see them are not receiving direct sunshine, there being intervening clouds between them and the sun.

This is a law that we photographers cannot afford to disregard, for simple photography records facts, and if we in our more ambitious work offend against the law of facts, we shall be bowled out—the science man will be down upon us.

Another point to be observed under this head is the form of clouds, scientifically—not artistically—considered.

Those low down towards the horizon present to our eye a very different shape from those seen overhead or at any angle between the two ; but we need not err in this respect if we are careful to make the horizon of the cloud negative correspond with that of the landscape.

By horizon is meant the sea level as seen where it meets the sky, which is practically the level of the eye, however high or however low our standpoint. There is often confusion in describing the sky line as the horizon. Sky line is where terrestrial objects meet with or cut it.

I shall not now go into the subject of the treatment of clouds from an artistic point of view ; but we must not offend the science man by printing in, for instance, evening skies and clouds with landscapes which it is evident have been taken at quite another time of the day. Should a landscape have been taken in direct sunshine with conspicuous shadows it would not be difficult, if the condition of the foliage be also taken into account, to arrive at a pretty correct conclusion as to the time of day at which the exposure was made. Thus it behoves us to be careful in the selection of our accompanying cloud negatives.

In landscape not, however, directly sunlit, or with no dominant lighting, there is a greater scope for the selection from our cloud negatives ; we need not be in fear of the science man, but may use fearlessly those that will best compose with our landscape from an artistic point of view.

I have already urged that after handing over to the sun his task to do, we should leave to him all the subsequent pencilling. In landscape photography (I mean landscape as distinct from portraiture) handy work in any form on the negative should be

considered inadmissible ; certainly the less hand-work the better. It may be legitimate to spot out defects should such perchance or by accident be met with, but the introduction into a picture of features that are not produced by real photography is to be deprecated.

To manufacture a horse's ear on the negative, or a cow's tail—things often observed to be absent if taken in summer after the month of June—cannot be called photography ; but to manufacture clouds and palm them off as photography is distinctly reprehensible ; it begins with fraud, which will be discovered ; it will end in discomfiture of the perpetrator and discredit to photography.

Perhaps even less allowable should it be considered to touch up prints by paint or other hand-work, and introduce features not existing in the negative. We should leave to the sun to pencil, we may call on him to help us to rectify our errors (for instance, by toning down our high-lights, or inducing him to moderate his transports in over-printing shadows, both probably results of our own want of judgment or skill) ; or even, if we have exactly succeeded in rendering his intentions, he will come to our aid and will help us with any of our conventional notions of what we may consider beautiful or artistic, notwithstanding our presumption in supposing that his perfect work can be improved.

If photography is to be pursued as a pastime, and the amateur has any ambition to excel in his work, the whole of it must be done by himself. Should he buy or borrow cloud negatives to print with his landscape, or landscape negatives to print with his skies (!), the resulting work will not be his photography ; let him produce never so fine a negative and print in somebody else's clouds, he may secure a picture, but it will not be his work ; and further, should he put his negative into the hands of another—perhaps a professional printer—to print, the resulting work will not be his photography ; and should he have the temerity to exhibit it and palm it off as his work, nothing less than a fraud will have been attempted.

A week or two ago, during my holiday in the West of England, I met with a photographer at a seaside place engaged in taking views of the little town from the cliffs, and got chatting with him. It was breezy weather, and the clouds were unusually grand in all directions. I was almost inclined to relinquish a walk I had planned over the Quantock Hills, so as to fill my box with cloud plates, and intimated to him my almost resolve. He smiled a smile of scorn, and let drop the remark, "It is much easier to buy one's cloud negatives, and much cheaper ;" but he was one who gained his livelihood by photography.

This was almost on a par with an incident that occurred not long ago. A gentleman—a stranger—called on me. After a bit of palaver that he was an amateur photographer, he remarked that he was quite sure I must possess a great many landscape negatives (a fact I could not conscientiously deny) ; he then went on to say that he had secured some very fine cloud negatives from his top window, but not having leisure to give to outdoor photography he would be very glad if he could come to some arrangement to borrow some of my landscape negatives to print them with !

In our ordinary landscape work—at least where we have much near foliage, or figures, or other dark objects—however beautiful and suitable may be the prevailing clouds, we are unfortunately obliged to disregard them, as we can seldom expect to get a good rendering of them, and at the same time do full justice to the landscape.

It is, therefore, quite admitted by all who are qualified to have an opinion on the matter, that if pictorial and artistic work is legitimate with photography, and we are to make the best progress open to us in this direction, it is necessary, until science further steps in to our aid, that we should print in clouds from a second negative ; in fact, it is only persons ignorant on the whole matter who now at all raise the question of the lawfulness or propriety of it.

If the difficulties of printing in figures with our landscapes from separate studies and separate negatives were no greater than in printing in clouds, another important advance in the direction of making photography an art would be established ; but there are many more points to be considered, and far greater difficulties to be overcome, than in the comparatively easy process of cloud-printing.

In the difficulty, however, of it lies a safeguard against the abuses which would be certain to accompany such a practice—abuses far more serious, reprehensible, and detrimental to the art interests of photography than with cloud-printing.



## Notes.

The Bath Photographic Society seem to bid fair towards being an active and useful association, and it has just secured the co-operation of C. H. Talbot, a son of Fox Talbot, in respect to the elucidation of certain points in the history of photography. There is, we understand, a considerable mass of documentary matter relating to the subject.

Travellers who set up their cameras in uncivilized countries all agree that the natives are terribly frightened at the strange machine, which, with its one eye immovably fixed upon them, threatens to inflict all kinds of unknown evils. But the wildest imagination would never suggest the horror with which the natives of Corea have invested photography. It is, however, gravely stated that the Secretary of State at Washington has received a despatch from the United States Consul at Seoul, Corea, confirming the newspaper reports of the recent outbreaks in that country, and saying, in addition, that the trouble originated over a belief among the natives that the American missionaries were stealing their babies and boiling them into chemicals to make photographs with!

Not long ago we asked readers to forward us their experiences in the form of short papers for the coming YEAR-BOOK, and in repeating the request we would suggest the desirability of each paper bearing the name of the writer. Very often the post-mark or the writing affords a clue as to the authorship of a communication which we should otherwise be unable to use, because not knowing who sent it; but the article itself should always bear the author's name. Short papers dealing with or describing special methods of working are most acceptable.

A characteristic feature of the exhibition just opened is the marked favour shown towards platinotype and coldness of tone generally. The warm chocolate-toned silver print is almost entirely discarded so far as landscapes are concerned. In many cases the platinotype is a distinct gain, but in others it may be doubted whether the choice is a judicious one. In a word, fashion has set in for cold tones, and fashion must be obeyed. Photographers in this respect are a little ahead of the public—that public, we mean, who know nothing about photography, and who look upon the exhibition as they look upon other exhibitions, a place to while away half an hour in. The other day a lady critic was overheard to say, "I am not quite sure whether I like some of the photographs. What is the reason so many of them look as if they had been taken by the limelight?" This was, on the whole, not a bad way of expressing the effect which platinotype prints had upon her mind.

A new occupation for women is suggested by the *Court Journal*. It tells of a young lady amateur whose instantaneous photographs attracted the attention of an artist friend, who, "to her surprise, offered" buy half-a-dozen

of the best for suggestions for studio work." The idea was new to her, but as she was in want of money she resolved to turn what had been play into work. "She and her camera," we are told, "are out from ten o'clock until three now-a-days, and an hour in the dark room of an evening brings some of the characteristic scenes of City life to her negatives, and ready to be transformed into cash." This reads remarkably like an English version of an American story which was referred to months ago in these columns.

One of the newly-elected sheriffs has been pestered to death for copies of his photograph for publication. He refused on the ground, so the *City Press* says, that "it is not incumbent upon him to so publish broad-cast portraits and biographical sketches as to cause possible enemies to circulate the *canard* that he is a pill manufacturer, whose sole aim is to obtain a good advertisement as cheaply as possible." This is rather a far-fetched objection. We are informed that the real reason was that the gentleman in question had only got one photograph, and this was so unfavourable that, instead of making him look like an important functionary whose duty it was to hang criminals, it gave him the aspect of the person about to be hanged!

It seems that the police authorities are at last taking some action with regard to photographing bodies of those murdered and mutilated in London streets, but the work seems to be done in the same sort of clumsy way which is characteristic of the force. One would think that the authorities would have made enquiries as to who, in London, is best qualified to do this especially difficult work—work involving the highest skill of the anatomist, besides photographic knowledge; but it is not so. A military martinet, like Sir Charles Warren, only aims at making men all alike, and is totally unable to understand that a photographer may be an excellent and skilled worker, and yet unable to do such work as is required in the case of the mutilated bodies.

Accuracy in matters which take place three thousand miles away is perhaps of not much importance. At least the *Evening Post* apparently thinks so. It had a paragraph in a recent issue in reference to the New York divorce case, the history of which we gave last week, its peculiar feature being the evidence which an instantaneous photograph will furnish. The *Evening Post* puts the case this way:—"An assistant in the large photographic studio of Mr. Falk in New York has brought an action for divorce against his wife and another assistant, and part of the evidence against the couple will be a photograph of the pair in *flagrante delicto*, taken by Mr. Falk by the aid of a strong magnesium light." The plaintiff, we need only say, was not an assistant to Mr. Falk, neither was the correspondent an assistant, nor was the photograph taken by Mr. Falk. With these exceptions the paragraph is accurate.

In spite of the utter futility of the mental process involved, one is often tempted to surmise what additional advantages would have been enjoyed by us, the present inhabitants of this planet, had our forefathers only been clever enough to anticipate certain of the great inventions



which will make this present century so famous in scientific annals. Now, we naturally reckon the photographic camera as one of the great inventions in question, and an endless vista of interesting possibilities is opened up, if we merely start with the supposition that the photographic process had been discovered and turned to general account a hundred or even fifty years, say, earlier than it was in reality. Our readers need not be alarmed, however, for we do not intend, even in face of the fact that the usual discovery of the prehistoric toad in a granite block shows that the silly season has set in with its customary severity, to indulge in the not infrequent practice of gloating once more over that ideal crop of photographic "might-have-beens" which would probably have been gathered had (if we may so put it) Daguerre been his own grandfather. At the same time it is impossible not to re-echo the wish expressed by a correspondent in a contemporary, that amateur photography had been a fashionable amusement when Waterloo was fought. For then, need we say, not one, but probably twenty people would have photographed that mysterious historical Brussels ballroom in which Wellington and his officers danced on the eve of the great battle; and the present generation of newspaper readers would not have been so provokingly puzzled by the endless contradictory statements—all made with equal positiveness, and all seemingly equally incorrect—which have appeared, are appearing, and seemingly will continue to appear until the great serpent or a seven-legged calf, or some other *lusus nature*, comes upon the journalistic scene. As it is, the Waterloo ballroom still undoubtedly holds the field, and according to the latest detailed statement of yet another guest who was present at the dance, it would now seem that this high-pitched, low-roofed, capacious, cramped, over-ornamented, bare, first-floor apartment, in a back garden, over a coach-maker's front shop, on the ground floor of the wing of a hospital, in three different Brussels thoroughfares, was, after all, the schoolroom of a house in another street altogether.

Lady Tighe is, of course, quite certain that this schoolroom was the ball-room, just as all the other correspondents have been in their turn quite certain that it was a granary, and a brewer's warehouse, and a show-room, and a drawing-room, and an in promptu shed, and a *salon* in the *Hôtel de Ville*; and really it would not surprise us to be assured in due course that the historical ball also took place in a railway station, a theatre, the building now devoted to the Wietz Paintings, and a marquee. And to think that the exposure of one simple dry plate might have obviated all this bewildering discussion, and prevented all this indubitable, though we are glad to think innocent story-telling! It is really a most tantalizing thought, and suggests vividly once more how absorbingly interesting past history would be if only it could be illustrated with photographs of the time. "Dry plates," in sooth, would make what is now dry reading of entrancing interest.

#### A MECHANICAL FOCIMETER FOR ENLARGEMENTS.

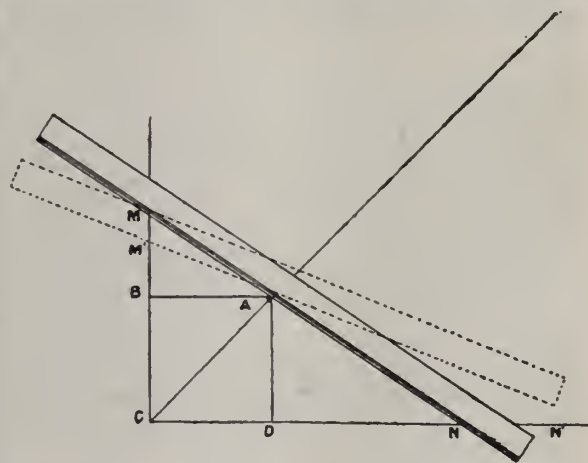
BY LYONEL CLARK.

WOULD-BE enlargers often waste considerable time in finding by trial and error the particular position, with regard to the lens,

that the negative and screen, which is to receive the enlargement, should have. The calculation for this is, it is true, an extremely simple and easy one, and will be found in all the most elementary books; but many amateurs have a wholesome dread of *x*'s and *y*'s, *a*'s and *b*'s, and this little apparatus has been specially devised with the idea of doing away with all calculation whatever. I may as well at once acknowledge that the main idea of the whole apparatus belongs to Sir Howard Grubb, who described it in the pages of this year's "British Journal Almanac" ("British Journal of Photography Almanac," 1888, pp. 286-7), and the present apparatus has been, one cannot say "perfected," in regard to any Sir Howard Grubb has done, but rather developed to suit the requirements of a numerous club.

For members who have not their almanac handy, Grubb's method may be recapitulated roughly thus:—A square, A B C D (fig. 1), whose sides are equal to the focal length of the lens to be used, is laid off on a board, two of its sides are prolonged, at A a pin is inserted, and a straight-edge is laid against this pin and rocked. The straight-edge cuts the prolonged sides C B, C D, of the square at any two points, C N and C M. Now C M and C N represent always a pair of conjugate foci for the particular lens that the square has been constructed for, and if we make C N three or any number of times C M, we have the position of the conjugates when it is required to enlarge an object three, or whatever the number may be, diameters. It is, perhaps, hardly necessary to state that the negative or object to be enlarged is to be placed at the lesser conjugate, and the image or enlargement at the greater conjugate focus. In the case of reduction, the inverse obtains, the object being placed at the larger, and the image at the smaller conjugate. The conjugate focal lengths are, of course, measured in opposite directions from the optical centre of the lens.

To take an example, the sides of the square are 6"—that is, the focus of our lens is 6". C N is so placed that it is four times



C M; that is, we are enlarging four diameters. We measure C N and find it is 30", and C M we find to be 7.5". We must, then, in order to enlarge an object four diameters with a 6" lens, place the object or negative  $7\frac{1}{4}$ " from the optical centre of the lens on one side, and the image or enlargement 30" from this centre on the other side.

We can see this to be correct by applying the ordinary rule—

$$x = (n \times f) + f$$

where *x* is the distance from enlargement to centre of lens—that is, the greater conjugate—*n* the number of diameters to be enlarged, and *f* the focal length of the lens.

Here  $n=4$  and  $f=6$

$$\therefore x = (4 \times 6) + 6 = 30'' \text{ for one conjugate,}$$

and the other conjugate, *y*, is found by the equation—

$$y = \frac{x}{n}$$

$$\text{that is } \frac{30}{4} = 7\frac{1}{2}''$$

Now, the apparatus described by Sir Howard Grubb is very perfect where only one lens is used; but, in a club like ours,



everyone uses for enlarging a lens of different focal length; so that in my new arrangement, instead of laying off the position A of the pin for one lens, A is made movable, and can slide up and down the diagonal C A extended. This diagonal is laid off to scale, so that one can adjust A for any focal length; the exact scale is easily determined. We know the length of the sides, B C, B A, of the right-angle triangle A B C, of which A C is the diagonal, and by the 45th problem of Euclid, we find its length corresponding to any length of C B; C B, it being remembered, is the focal length of the lens to be used— $(A C^2 = B C^2 + B A^2)$ . It is, therefore, very easy to project on to C A prolonged a scale which shall correspond to the focal lengths of any lens that we may lay off in actual dimension on C M. The pin A, being carried on a slide, can be moved till its index points to the number on the scale corresponding to the focal length of the lens that we wish to use.

In Sir Howard Grubb's method we have to find out for any definite number of diameters that we require to enlarge, a distance on C N; that is, the same number of times C M. Now, this is not a very easy job, and moreover, when we have found these distances, we have got all we require, for they are at once the conjugates for all lengths required. In the apparatus which I have constructed for the club, I have done away with this difficulty, and so arranged it that the veriest tyro can, without any calculation, obtain the data he requires.

We have seen that the distance C N is to the distance C M, as the number of diameters we wish to enlarge. This fact is irrespective of the position of A, which is determined solely by the focal length of the lens used, whether we use a 6-inch lens or 12-inch lens. To enlarge four diameters, A N must be four times the length of A M. Now, since the angle B C D remains constant, and the sides C M and C N remain proportional, it follows that the angles A M C, A N C, will always remain the same respectively, whatever the positions of M and N, for when the sides are proportional in triangles the angles are respectively equal. Therefore, when we once find the angle C M A or C N A, that the straightedge makes with the vertical or horizontal for a given number of times of enlargement, it will remain correct for any position on C A where we choose to locate A. If, then, at A we place a quadrant, and finding out the angles A N C, A N' C, A N'' C, for a series of numbers of diameters, wherever we place the pivot A on the diagonal C A, on adjusting our straightedge to our newly-found angles, it will cut the sides C M, C N, at points which will represent the respective conjugates for that number of diameters. All we do then is to place A at the spot corresponding with the focal length of our lens, swing the straightedge M N till it cuts on the quadrant, the line corresponding to the number of diameters we wish to enlarge, 2, 3, 4, or 5, and the new distances we read off on C M and C N will be the conjugate focal lengths required.

The machine is of extremely simple construction, and any one can make one for himself. The one I have made for the club is built to a scale  $\frac{1}{4}$  natural size, and is fit for use with lenses of any focal length up to 30", and will give the larger conjugate focal length up to 6' 0", this being the maximum extension of our new enlarging camera.

The practical operations are very simple. You only require to know the focus of your lens and the number of diameters you wish to enlarge. You slide the straightedge up and down the diagonal groove till its index stands opposite the number corresponding to the focus of your lens. You then swing the straightedge on its pin, till its edge cuts on the quadrant, the line corresponding to the number of diameters you wish to enlarge; you read off on the horizontal scale the distance the enlargement is to be from the centre of your lens, and, on the vertical scale, the distance the negative is to be from the centre of the lens. For instance, we wish to enlarge a half-plate, say  $6\frac{1}{2}$ ", clear up to a 15" by 12", 15 divided by  $6\frac{1}{2} = 2\frac{2}{3}$ , that is, 2.3 diameters. Our lens is 8" focus; we place the sliding proof opposite 8", swing the straightedge till it cuts the line 2.3 diameter on the quadrant, and read off for the larger conjugate  $2 \times 2\frac{2}{3}$ ", and the smaller  $11\frac{1}{3}$ ".

Now, by calculation, *vide* equation above, we get

$$8 \times 2.3 + 8 = 26.4 = 2' - 2.4", \text{ and } \frac{26.4}{2.3} = 11.48".$$

In the case of reduction, the calculation remains the same, only the position of the image and object change; that is to say, that to reduce 2.3 times, the negative is placed  $11\frac{1}{3}$ ", and the reduction  $2' - 2\frac{1}{3}"$  from the lens centre.

Another use can be made of this little machine, and that is, knowing the size of enlargement we wish to make, and the maximum extension of our camera, what is the maximum focal length of lens we can use. We wish to enlarge 4 diam. Our camera extends to 3' 0". Swing the straightedge till it cuts the 4 diam. line, and then slide the pivot till the straight-edge cuts the horizontal scale at the 3' 0 mark. You at once read off on the diagonal focal-length scale that you can use a lens of  $7\frac{1}{4}"$  focus.

I cannot help thinking that the above little apparatus will be of use; it is so simple in its use; but I must again say that the whole credit of it is due to Sir Howard Grubb's primary idea in this year's "Almanac."

## REMARKS ON THE PRINTING-OUT PLATINOTYPE PROCESS.\*

OPINIONS OF SOME OF THE MEMBERS OF THE CAMERA CLUB.

As some members may not be aware of the process of working the new printing-out platina paper, it may be as well to state that it is printed in the frame by daylight, as with the hot process or with silver paper. When the image is fully out to the taste of the operator, the print is treated with a weak bath of hydrochloric acid, strength one in sixty about, or citric acid may be used somewhat stronger. The strength within reasonable limits is immaterial. A few minutes in each of two such baths, followed by a slight washing in three or four changes of water, and the work is complete. The opinions expressed in these articles will supply all that is required to understand the peculiarities of the paper. [Memorandum of the editor of the *Journal of the Camera Club*].

W. ADCOCK.—Pizzighelli is one of the greatest imaginable boons. If sold cheaply, and if it can be made plus a fair expense paying profit all round, it will displace much silver, much bromide, and much all other papers. The advantage of even breathing on the surface before exposing may be seen by laying a protecting narrow strip of card across or at a corner of paper. This will be found many shades lighter than the other part. In case I wish for well-defined light prints, I have avoided damping advantageously. A splendid paper in which need be no waste, as the required tone is easily printed to exactly.

W. BROOKS.—I find it very convenient while away from home. As regards rapidity, I do not find it much quicker in printing than silver paper, but, of course, there is a considerable saving of time in the after processes. I have found one or two pieces of it covered with small white spots, the cause of which I cannot account for; also one or two which go black in mottled streaks all over; but that, I think, can be avoided if the paper is taken care of. Finished prints seem all right—at all events, three weeks of sea air have not hurt mine.

FRANCIS COBB.—As nearly as one can judge from a new thing, this seems likely to prove the process of the future, but there are several serious faults in the present material that require to be altered. In the first place, the paper itself is inferior, and before it can compete with the old platinotype must be improved considerably. Then the chemicals are not spread on the paper with that evenness that is absolutely necessary for first-rate work, and some sheets look as if the solution had been applied with a whitening brush; but these are all faults that can and will, no doubt, be remedied. The paper gives great latitude in the printing. I left by accident two frames exposed for many hours, and quite expected that the sheets were spoiled, but they resulted in fairly good pictures.

J. DREDGE.—So far, my experiences with the printing-out platinotype paper have been rather puzzling, and at present I am more hopeful than convinced that it will have a wide range of usefulness. I have obtained a few very excellent results with it, especially in portraits, and from negatives that failed to give good prints either with aristotype or silver paper. In such subjects it would seem as if its inability (in my hands) to give sharp detail is an advantage. Considering that with some prints I have secured a good range and intensity of colour, while others, from the same negative, were pale and flat, I am sure that the manufacture is at present defective; this is also clearly shown by the presence of spots and pale markings, which have (with me) utterly spoiled otherwise fair prints. The margins of the sheets are also very defective, owing to imper-



fections in coating. I would also point out that the ragged edges on the cut sizes, as they are now sold in packets, are annoying. I believe that the paper, even now, would be admirable—apart from surface defects—for printing from enlarged negatives, and I have seen some beautiful specimens produced from pencil drawings. Altogether, I think there is good reason to hope that when the manufacturers have improved the method of production, the paper will find a wide range of application. In some cases I have found that the acid clearing-bath has reduced the colour of the prints, but this does not seem always to hold good. I have never tried the cold bath platinotype process.

**E. FERRERO.**—I am very pleased with the results, but the preparation of the paper leaves much to be desired. The solution is laid on by hand, and the marks of the brush show. I do not think you could cut out of a sheet of paper a piece 10 by 8 without faults. Another fault, which appears only in the last supply I had, is a mottled appearance, as you will see in the enclosed print (not fixed). I do not find special precautions necessary to keep it for at least a few weeks. I have kept it simply in a black envelope, then also in a calcium chloride tube; then, again, the same got so wet, that the whole box was damp inside, and no harm came of it. The paper, when dry, takes as long to print as silver paper, and less when damp. A good plan is to pass each piece of paper over a can of hot water, and then stow them in a box for use the next day. The print can be intensified, either wholly or locally, after printing, by breathing on it or holding over hot water. This, however, is only effective when the paper was printed dry. When the paper was damp before putting in the frame, the effect is very slight. Negatives with too great contrast or too little will not do. The slightest sign of fog unfits a negative for it, although it may give a capital print on silver paper.

**FRANCIS HOWLETT.**—My experience of it is rather limited, but I have already formed a very favourable opinion of its capabilities. The process of printing and finishing are absurdly simple and easy, and the resulting prints are nearly, if not quite, equal to the old process. The only fault I find, so far, is that the printing in a weak light goes on so very slowly, although in a very good light or in direct sunshine it seems as fast as silver paper. Damping the paper certainly accelerates printing, but I do not then find the prints so bright, and breathing on the paper sometimes gives a nasty, mealy appearance. The slow printing quality will, I fear, render it unsuitable for winter work in London, at least for those who, like myself, have to do their printing in odd half-hours.

**F. SETTON SCOTT.**—In my opinion this cannot compare for a moment with the "Platinotype Company's" processes. Fair results can be obtained by it, and certainly good prints from negatives so thin that otherwise only good bromide prints would be obtainable. But, although the results by this paper are soft in appearance, I have, up to the present, failed to obtain either richness or brilliancy. In regard to other platinum processes, I find that I can obtain (from good platinotype negatives) equally good results, by either working the hot or cold methods of development, and do not think that any one could detect by which method the examples had been produced. Undoubtedly the cold development produces better prints from poor or thin negatives. The advantages of the cold development over the hot are:—First, that one can print out much further, until all detail is fully visible; and second, the print can be watched during development, and stopped at the required depth by plunging it into the acid bath, and even portions may be checked by applying the acid solution with a brush locally, on any part that would otherwise have become blocked up before the rest of the detail had developed out sufficiently. Its principal drawback is its great expense in working, but this can be greatly reduced by pouring a little of the developer into a saucer, and developing with a broad camel's-hair brush. If this is applied quickly, no lines will show. In mounting prints produced by the cold bath, care must be taken to avoid rubbing the platinum salt off the edges, it being more on the surface of the paper.

**CAPTAIN F. D. TAGART.**—I have tried the printing-out process, but I must say the result was disappointing. There was no brilliancy or detail about the prints as compared with silver prints from the same negatives. I hope to get better results when I try again. I rather suspect the paper had not been kept sufficiently dry.—*Journal of the Camera Club.*

## PRESS NOTICES ON THE PHOTOGRAPHIC EXHIBITION.

The TIMES of Monday last says:—

The annual exhibition of the Photographic Society opens this morning at the rooms of the Royal Society of Painters in Water Colours, in Pall Mall. Though the enormous popularity of photography, and the number of persons who practise it as an amusement, has given rise to a great number of exhibitions both in London and in the provinces, the exhibition of the old Society, which was established as long ago as 1853, still holds its own, and it is to Pall Mall that every succeeding September the best photographic work of the year, both professional and amateur, naturally finds its way. The principal change in the system for the present year is that the Council of the Society have discontinued the award of medals for the best pictures. It was thought by many that this alteration of a long-standing practice would seriously affect the exhibition, and would lower the character of the pictures sent in. This, however, has certainly not been the case. If there are no pictures of very exceptional merit, no startling novelties marking special advances in the science, at all events the collection as a whole need not fear comparison with any of its many predecessors.

One principal feature of the exhibition is certainly the number of pictures in it which are produced by the platinotype process. This fact offers striking evidence of the extent to which the newer method has taken the place of the older process of silver printing. To so large an extent is this the case, that the appearance of the whole collection is entirely different from that of all photographic exhibitions held more than a year or two ago. The photographic tones of brown and purplish black are no longer in the ascendant. The room is filled with pictures varying in tone from a cool grey to a strong engraving black, many of which might almost be mistaken for mezzotint. Last year the honours between silver and platinum were about equally divided. This year the more costly metal has it all its own way.

This change is doubtless due to some extent to an alteration in public taste, but it has been assisted by improvements in the platinum printing process itself. Of these the most important is one due to Captain Pizzighelli. In the usual platinotype process the paper is coated with a mixture of certain salts of iron and platinum. It is the iron salt which is affected by the light, and when the printed picture is placed in a bath of certain salts, the iron reduces the platinum to the metallic state, and causes it to be deposited on the lines of the picture as platinum black. In the new process the iron compounds are so modified that they have a reducing effect on the platinum when dry, or rather in the presence of the very small amount of moisture contained in the paper. The process thus goes on during the progress of the printing, and can be watched, instead of requiring to be brought about by a process of development. When it is sufficiently far advanced, all that is necessary is to treat the picture in a bath of weak acid, to dissolve out the remaining unaltered salts, and so stop the process and fix the picture. The operation of photographic printing is thus reduced to its simplest terms, the "development" required for the original platinotype process, and all the complicated and tedious operations incidental to silver printing, being alike dispensed with. The only question is whether the new process gives as good results as the old one, and, judging from the pictures now shown at Pall Mall, it appears certain that if not quite as good, they are certainly not greatly inferior.

Of all the pictures shown, those which will attract most notice are certainly the photographs of Palmyra taken by Mr. Horace Gridley. These are believed to be the only photographs in existence of the wonderful ruins of Zenobia's city, a previous endeavour to photograph them, made in the old wet-plate days, having failed. This gives especial value and interest to the pictures, which are also of the highest photographic merit. It naturally generally happens that travellers who have opportunities of photographing out-of-the-way places are not skilled photographers, but these views would take a first prize simply as photographs, apart from their intrinsic value. Another series of great interest is contributed by Mr. W. K. Burton, and shows the effects of the great earthquake which a little more than two months ago destroyed a considerable portion of Mount Bandai in Japan. These photographs were taken under conditions of no small difficulty, and indeed of danger, for it appears that the precise spot on which at one time the artist had been standing was, a few hours later, destroyed by a second smaller eruption.



Passing from these, the best pictures of the year certainly belong to the class including groups of country-folk or fishermen, incidents of rustic life, and the like, figures with landscape, but in which the landscape is subordinate. There are several admirable series of these, among which it is difficult to select the best. On the whole, perhaps the preference may be given to Mr. Gale's, though Mr. Sutcliffe runs him very close. The latter has taken most of his subjects from the sea and the shore, while Mr. Gale has confined himself to scenes of rustic life. Both alike show consummate mastery over their materials, Mr. Sutcliffe perhaps showing the greater cleverness in the natural arrangement of his groups, while Mr. Gale is more skilful in his selection and arrangement of the surrounding accessories. Another very successful artist in the same class of work is Mr. G. Davison, whose pictures also include a most charming view of a fleet of fishing boats in full sail. Mr. Renwick, though his contribution has been given one of the best places in the room, has, to our thinking, been less successful. His picture of a shoeblick offering to "shine the boots" of a one-legged customer smacks of the studio, and lacks naturalness. Some good work of this class is shown by S. Couway, B. J. Wilkinson, and J. H. Mummery.

Pure landscape, or landscape in which the figures play a subordinate part, is of course very fully represented. Mr. H. Tolley has some fine views, but nothing quite so good as he showed last year. Mr. F. Beasley sends some beautiful Australian forest views, and Mr. T. M. Brownrigg some picturesque bits from Surrey and the Lake district. Mr. Wainwright has some excellent views from the same district, and some rustic scenes which are less successful. Mr. Vernon Haath contributes a number of landscapes and architectural views, which, though excellent, appear to owe a large part of their merit to handwork, and will therefore be less admired by photographers. The School of Military Engineering, as usual, send some choice landscapes, views in North Wales. There are not as many Swiss views as in some former years. Captain Abuey and Mr. Edwards send the most important series, all views in the Bernese Oberland. An especially interesting pair of these shows the Wetterhorn in summer and in winter, both views being taken from the same spot. Mrs. Main has a nice frame of views in the Engadine, and there are one or two other Alpine pictures. Mr. W. Bedford's excellent set of Welsh views suffers from the colour in which they have been printed. Mr. Hilditch's views of Venice are very fine. Mr. Sawyer's three pictures, taken in the Castle Garth, Newcastle, are admirable. Some fine enlargements of views of the Forum and the Coliseum at Rome by Mr. W. Cobb should also be mentioned.

It would appear that the photographing of yachts is a less popular amusement than formerly. The two most important frames containing such pictures are sent by Mr. H. Symonds and by Messrs. West and Son. Both of these are excellent, and both will find admirers. Of the two, Messrs. West appear to us to have a little the best of it this year, as Symonds had two years ago.

Other pictures deserving notice are some studies of dead game, by Mr. A. F. Lafosse, and a frame of views on the Norfolk Broads by the same exhibitor, four instantaneous views of foot-races, by Messrs. Scott and Wilkinson, and a photograph of fireworks, by Mr. W. Davey.

There is, as usual, some very commonplace work among the portraits, but, on the other hand, there is some very good. Two three-quarter length figures, by W. W. Winter, in platinotype of a sepia tone, will certainly be considered the best by most critics, and next to these may be placed a long series of portraits by Mr. R. Faulkner. These are about as near an approach to mezzotint as has yet been produced by purely photographic processes, and are excellently suited for book illustration. The Autotype Company show a fine study of a head, printed in red chalk (carbon) from a photograph by Mr. M. Sallnow; Mr. W. J. Byrne shows some large heads direct from life (not enlarged), and some portraits taken in ordinary rooms. The other portraits do not call for much remark, at all events of a favourable sort.

The exhibition contains some fine examples of the application of photographic methods to the production of printing surfaces. Some fine, large photogravures, reproductions of paintings, are shown by Boussoad, Valadon, and Co., and some excellent small plates for book illustration, direct from nature, by the Typographic Etching Company, and the Autotype Company. Annan and Swan also show some reproductions from oil paintings of the highest excellence. It is a pity that a print in colour from a

plate should be entitled in the catalogue a "photograph in colours." Such a title is misleading and suggests a connection with certain recent attempts to persuade the public that the philosopher's stone of photography, the reproduction of natural colours, had really been discovered.

Some ordinary looking prints in the same part of the gallery as that containing the photo-gravures will probably not receive the attention they deserve from the fact that they were produced just forty years ago. It would be interesting if, for the sake of comparison, a few such relics of antiquity could be shown from time to time among the work of the best photographers of our own time. They would show how little real progress we have made in the results obtained by photography, great as have been the improvements in methods. Another interesting picture which has been unjustly relegated to the floor is a landscape taken without a lens, merely by the use of a pinhole, by Mr. G. Davison. From time to time such pictures have been produced as curiosities, but it is only of late that the suggestion has been made that such a method is practically available. The picture in question was taken on a fairly bright day with an exposure of a quarter of an hour, the size of the hole being a fiftieth of an inch. It is about ten inches by eight in size, and the plate was placed at about twelve inches distance from the hole. An ordinary exposure with a lens might have been about two seconds, so that with the small amount of light admitted through a pinhole between four hundred and five hundred times the amount of exposure is required. Another exhibit of considerable scientific interest is contributed by Messrs. Vogel and Obernetter. It consists of a number of similar views, taken on ordinary gelatine plates and on plates prepared with eoside of silver. Such plates are to a large extent isochromatic—that is to say, they render the different colours of the spectrum into light and shade more truly, or at least in a manner more consonant with the impressions received by the eye, than do the ordinary plates. These, as is well known, exaggerate the effect of the blue rays, while giving a lessened value to the red and yellow, so that in the photographic print blue shows almost white, and yellow black. For copying pictures the isochromatic plates have for some time been found of great value, and their use has often been recommended for landscape, but has not been generally adopted. The series sent by Messrs. Vogel and Obernetter illustrate this use of the plates, and shows how foliage can be more truthfully rendered, and how such subjects as white clouds against a blue sky can be successfully treated. It is, however, but fair to point out that some of the specimens put forward as produced on ordinary plates are not such as would be accepted by any moderately skilful worker as fair samples, and consequently the comparison loses some of the value it would have had had the selection been made a little more fairly.

In addition to the pictures, there is a good show of apparatus, including cameras, shutters, stands, lamps, and all the miscellaneous apparatus which now seems essential to the not very complicated or difficult operation of taking a photograph. Among the most curious of the apparatus shown are the "detective" cameras. Of these there are several types and sizes. The smallest is made up in the form of a book, and takes pictures about an inch and a quarter square. It is provided with an ingenious device for shifting the tiny plates which are used as each exposure is made. Twenty-four pictures can be taken by it without recharging. The name of the inventor is Krugener, and it is shown by Marion and Co. Next in size to this is the very clever little instrument shown by the American Eastman Company, and named, doubtless for some good reason, the "Kodak." In this the sensitive film is mounted on paper instead of glass, so that the apparatus is much lighter, and more compact. The camera is about six inches long by three broad and high, but it contains in this small space material for taking no less than 100 pictures, each a circle of two inches and a half in diameter. The shutter is of very novel construction, so contrived that in setting it the lens is not uncovered, as is the case with most, if not all, ordinary spring shutters. The paper is wound in a continuous roll, as in the now well-known "roller slides," so that a fresh surface is exposed each time by the turn of a key. Altogether, this appears to be the neatest and most complete apparatus of the sort yet brought out. A rather larger detective camera, the invention of M'Kellen, is shown by Marion and Co. In this until the moment of exposure the operator can see the view he is about to take, by means of an inclined mirror, which at the moment of taking the view, flies up out of the way. This device is not new, but it has probably not been applied before to cameras



of this description. There are other ingenious fittings about the instrument which, however, leaves the idea that it would be rather complicated for practical work. The plates are shifted without opening the camera, mechanism being provided by which each plate after exposure is dropped into a receiver at the bottom of the camera.

The ECHO of Tuesday says:—

The Exhibition which will be opened to-day by the Photographic Society of Great Britain, in the rooms of the Royal Society of Water Colours, may be taken as a measure of the extent to which photography can, at present, take the place either of oil or water colour in the artistic representation of man and nature. The sphere of the portrait-painter has already been largely encroached upon, if not all together superseded among all but the very great and the very rich. Will the landscape-painter have to follow? Will his laborious and expensive methods be driven out of the market by the cheap and easy plan of the photographer? The photographer's hour is not yet fully come; but it looms in the possible future. There are many photographs in this gallery which, unless looked into very closely, might pass for engravings of the most delicate kind—as, for instance, the group representing rustic life in its different phases (73-83); and others, which it is difficult to distinguish from sepia sketches—as, for instance (24); or from the finest drawings in red chalk. But there is not one which could take the place of a good water or oil-colour. The photographer, of course, always has this inevitable advantage over the artist to start with—that he can attain, without any effort, to that precision in mere imitation which must precede and underlie all art, and which costs such tremendous labour to the artist. But his weakness is that he generally stops there; and the artist's function of putting into nature a meaning beyond what can be reached by mere imitation begins where photography ends. "Art's the witness of what is behind this show," as Mrs. Browning put it. But can photography get "behind this show?" There are several photographs here which go very near to getting behind it. Mr. Toley's "Deer Park" (13); Mr. Thurston's "Trespassers" (24); and "Cool Retreat" (47); Mr. Forsyth's "Woodland Stream" (56); Mr. Vernon Heath's "Views of the Thames at Richmond" (232-42); and Mr. Spiller's "Scene in Norway" (356); all these are photographs which display much of the artist's power of composition and selection, which, in a word, are almost pictures. But there is still a wide gulf between even these photographs and really good pictures. Even if we could suffer the loss of that branch of art which consists in the pleasing representation of colour—which we cannot, so that until photographers can imitate colour, the artist is quite safe—there would be much else wanting to a good photograph which is in a good picture. Even in such a case as that of representing a yacht in full sail, we still prefer the pictures of Miss Clara Montalba to the instantaneous photographs of Mr. Harry Symonds. Similarly in portraiture, we still believe that a great sphere is left for the artist in getting at the character that lies behind the outward show. But the character of a human being is far more on the surface than that of a landscape—which to many is invisible—and may often be grasped with great accuracy by the skilful photographer, as, for instance, in the portraits of Mr. William Morris (399) and Miss Mary Anderson (176 and 368).

## Correspondence.

### A DOG AS SITTER.

SIR,—As you have made some remarks on the now famous dog incident at my Cowes studio, and you do not seem quite clear as to the facts of the case, I beg to submit to you the published correspondence, and a print in platinum of the sagacious animal, from the negative taken on the occasion referred to.

The incident was very simple, and took place just in the way stated, and arose, I feel no doubt, from some sort of canine conversation.

ARTHUR DEBENHAM.

28, Union Street, Ryde, I. W., September 25th, 1888.

"STRANGE BEHAVIOUR OF A DOG.—Mr. Thomas Haden, a well-known and respected resident of Cowes, has had in his possession for some years past a liver and white spaniel dog, which has on many occasions given proof of great sagacity. A few days ago Mr. Haden was somewhat surprised by receiving a very

handsome photograph of the animal, accompanied by the following letter:—"Dear Sir,—We were agreeably surprised recently to receive a visit from Mr. Moody Haden. He sat down, making himself thoroughly comfortable for nearly half an hour, resisting all our efforts to dismiss him, and saying, as plainly as the very limited vocabulary of the canine race would



allow, that he wished to be perpetuated in a photograph. We were compelled to accede to his very evident and natural request, and now enclose you the result, with our compliments to self and Mr. Moody.—We are, sir, very truly yours, DEBENHAM and Co.' Strange to say, the dog has never before or since entered Messrs. Debenham and Co.'s premises, and on the occasion in question he left directly the photograph was taken. Messrs. Debenham and Co. have before now photographed a number of dogs, and it is possible that in some way one of these animals had conveyed the information to 'Moody' of the process to which it has been subjected."—*Hampshire Advertiser*, Sept. 5.

## SUTCLIFFE EXHIBITION AT THE CAMERA CLUB.

SIR,—Will you allow me to draw attention to the first of the series of "one-man" exhibitions of photographic pictures which are being organized at the Camera Club. The first exhibition will be devoted to the work of Mr. Frank M. Sutcliffe, of Whitby.

By the kind co-operation of Mr. Sutcliffe, we shall be able to present a fully representative show of his work, and believe that the exhibition will prove of great interest to photographers and artists.

The exhibition will commence on Tuesday, 9th October, and will continue open for about a month. Visitors will be admitted on presentation of card.—I am, sir, yours faithfully,

G. DAVISON, Hon. Sec.

21, Bedford Street, W.C., 2nd October, 1888.

## Proceedings of Societies.

### NORTH SURREY PHOTOGRAPHIC SOCIETY.

This Society will enter upon its third session on Tuesday evening, October 9th, when the first meeting after the vacation



will be held at the West Norwood Constitutional Club, Norwood Road, S.E. A paper on "The Benefit to be Derived from Photographic Societies" will be read by Herbert S. Starnes. Gentlemen wishing to become members are invited to communicate with the Hon. Secretary, Harold Senior, 88, Norwood Road, S.E., from whom all particulars may be obtained. All amateurs residing in the district are invited to attend this meeting.

#### BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The ordinary meeting of the above Society was held at the Technical Schools, Bridge Street, on Thursday, 27th inst., E. C. Middleton in the chair.

Messrs. A. C. Hutchison, H. G. Sears, Hugh Thomas, M.D., and A. Thomas were elected members.

Photographs of a viney from negatives taken on Edwards's isochromatic plates were exhibited by J. H. Pickard. These were taken direct against the light (plates being backed), and showed very fine definition and gradation of shade. Also "Note-Book for Roller Slide Work" (compiled by Sayce), by W. J. Harrison.

The CHAIRMAN announced the results from the recent "development competition," in which each member, on application, received three Ilford quarter-plates which had been exposed under a transparency. No further information was given, and the task before each competitor was to develop the three negatives, the prize being awarded to the best set of three. It transpired that the plates had been exposed under the same transparency, the shortest exposure being ten seconds, 10 inches from the source of light; the second, forty-five seconds, 8 inches from the light; and the third series, two minutes, 6 inches from the light. The longest exposure was something like two hundred times that of the shortest. A deal of interest had been taken in the result, no less than forty-two members applying for plates, while thirty-two had returned the developed results. Considerable difficulty had been experienced in judging, but eventually J. H. Pickard was adjudged the winner, W. J. Harrison placed second, while third and fourth places were held respectively by A. E. Pettitt and A. C. Townsend; the result proving that almost any developer might be used with these plates, as the first four sets were developed with, first, Beach's developer restrained by citrate of soda; second, pyro, ammonia, and sulphite; third, American standard developer; and fourth, hydrochinon. The resulting negatives showed under these circumstances the enormous latitude in exposure permissible if careful development was carried out. Prints had been prepared from the two first sets, and the evenness of the same was something remarkable when the immense variation in exposure was taken into consideration. The competition revealed the probable fact that some of the competitors were working with unsafe illumination in the developing room, as many sets were completely ruined by light fog, which the Chairman remarked should not have been apparent in the plates submitted to the shorter exposures.

Mr. PUMPHREY, while admitting the usefulness and importance of the competition, cautioned members against the idea that over-exposure under the circumstances described by the Chairman meant that an equally variable exposure might be given in the field, as the quality of daylight was so infinitely different to that by which the exposures had been made. He urged upon members the desirability of continuing the experiments in actual work, but doubted the possibility of producing negatives of equal value from two plates, one of which had received even three times the exposure of the other, and detailed his recent experiences with plates exposed during a recent trip to Italy, with those estimated to have received three times the normal exposure. Utter failure had resulted in all his attempts to develop same, although he tried all the dodges suggested by his long experience. He quite disbelieved the idea that bromide destroyed the latent image. He would suggest to the Council an arrangement for a similar competition, but with daylight exposures on a landscape.

GEO. A. THOMASON experienced considerable difficulty in getting density when plates were over-exposed, although he always used tentative development.

The CHAIRMAN said if he thought five seconds would be right, he should give ten, and alter his developer to match.

W. J. HARRISON referred to Bankart's landscapes with long exposures, and citrates as restrainers.

The CHAIRMAN remarked that we owed the introduction of the citrates as restrainers to Mr. Whatmough Webster, and he found them invaluable as restrainers.

S. J. FOWLER: Would not an exposure by magnesium light do better for these competitions?

A. C. TOWNSEND found no difficulty in getting density with the hydroquinone developer.

The CHAIRMAN remarked that one of Mr. Townsend's pictures was too dense, which point affected his chance for the prize.

A Member enquired if good results could be obtained on the Pizzighelli paper?

J. H. PICKARD obtains very good results, and keeps the paper in a cool place, such as a box in a cellar (this produces sufficient dampness for printing), and always immerses prints in weak solution of oxalate of soda before placing in the acid solution [prints produced]. A good negative is a *sine qua non*.

THOS. TAYLOR declared in favour of the Obernetter paper, and mentioned the fine detail it gives.

GEO. WILKES obtained much more successful prints with Obernetter paper than with other printing paper, but there was a difficulty in mounting them.

E. C. MIDDLETON remarked that the opals made by Obernetter were very fine, but lately he had been unable to obtain them; but Liesegang was manufacturing similar opals and paper, he believed.

A. PUMPHREY: In mounting these highly-polished surfaces, it is as well, when the prints are squeezed on to the temporary support, ebonite or glass, to coat the back of the picture with mountant, and squeegee the mount on to same, which, when dry, will pull off with the picture adhering, without damage to the finished prints.

#### BATH PHOTOGRAPHIC SOCIETY.

At a meeting of this Society held at 31, Gay Street, PHILIP BRAHAM in the chair, the rules framed by the Provisional Committee were discussed, and with slight modification accepted as follows:—

*Name.*—(1) That this Society be called the Bath Photographic Society, and shall consist of ordinary, corresponding, and honorary members.

*Object.*—(2) The objects of the Society shall be for the advancement of photography, the discussion of papers, and the exhibition of all matters of interest connected therewith.

*Meetings.*—(3) The meetings of the Society shall be held on the last Wednesday evening in each month, and excursions may also be arranged during the summer months. The chair to be taken at meetings at 8 o'clock. The Chairman shall have both deliberative and casting votes.

*Officers.*—(4) The business of the Society shall be conducted by a President, Vice-President, Secretary (who shall also act as Treasurer), and a Committee of five members. All officers shall be ex-officio members of Committee, and retire with the Committee annually; but be eligible for re-election. The election shall be by ballot. In the event of any offices becoming vacant, a meeting of the Society shall have the power to elect gentlemen to fill them. No President to be elected more than two years in succession.

*Committee.*—(5) The Committee shall meet at seven o'clock, on each ordinary meeting night, for the transaction of the business of the Society. Three to form a quorum, but no alteration of bye-laws to be made unless five be present. The Committee may make such bye-laws and regulations (not inconsistent with the rules) as they may from time to time deem necessary.

*Election of Members.*—(6) Candidates for membership shall be proposed by two members of the Society. The election of members shall be by ballot. Ladies, on the recommendation of the Committee, shall be eligible for membership without ballot.

*Subscription.*—(7) The subscription shall be 10s. 6d. per annum, payable in advance, commencing January 1st in each year. Members joining after July 31st to pay 5s. as subscription to the end of that year. The name of any member whose subscription remains unpaid two months after it has been applied for, may be removed from the list of members, and such member shall lose all claim on the Society. No member whose subscription is in arrear shall be entitled to vote. Members residing abroad may be exempt from their subscriptions provided due notice in writing shall have been given to the Secretary previous to their departure; such members shall not be entitled, during the period of non-payment, to any of the benefits or privileges of subscribing members.

*Annual Meetings.*—(8) The Annual General Meeting shall take place on the last Wednesday in February, when the balance sheet shall be presented, having been audited by two members (not being members of committee), and the election of officers take



place in addition to the ordinary business. (9) The Secretary shall be required to enter the minutes of the proceedings of the Society in a book to be kept for that purpose. The said minutes to be read for confirmation at the next meeting. He shall collect all subscriptions, pay current expenses, and make out a balance sheet at the end of each financial year. No monies other than current expenses shall be disbursed except by the order of the committee.

*Sub-Committees.*—(10) The Society shall have the power to appoint sub-committees for special purposes.

*Power of Expulsion.*—Any member making himself obnoxious to the members of the Society shall be reported to the Committee, who shall, after giving five days' notice to the member, investigate, and, if necessary, call a special meeting of the Society to discuss the matter; then if a majority of two-thirds of the members present so decide, the offending member shall be expelled from the Society, and lose all interest or benefit in it; such decision to be taken by ballot, and not by show of hands.

*Special General Meeting.*—(12) A Special General Meeting of the Society shall be called by the Secretary upon the requisition of five members. Notice of such meeting shall be posted to each member at least five days before the date of the special meeting, such meeting to be held on the usual meeting night of the Society, after 9 o'clock, but no business shall be discussed thereat, except that stated on the request calling the meeting.

*Alteration of Rules.*—(13) No alteration of or addition to these rules shall be made except at the annual meeting, or at a meeting specially convened for that purpose. Notice of such intended alteration or addition shall be posted to the members five days previously. (14) A copy of these rules shall be delivered or posted to each member upon election, but no member shall be absolved from obligation thereto on a plea of non-receipt. Canon Williams, Captain Molesworth, Messrs. C. H. Talbot (Lacock Abbey), Walter Pitt, A. J. Janvrin, Friese Greene, W. Harbutt, J. Dugdale, D. Sydney Horton, H. J. Walker, G. Spengler, A. W. Yabsley, W. Middleton Ashman, and the Chairman took part in the discussion.

Upon the proposition of Friese Greene, seconded by Walter Pitt, a vote of thanks was accorded to C. H. Talbot for honouring the Society with his presence, and in response—

Mr. TALBOT said that when first Mr. Ashman communicated with him he was doubtful whether he could be of any service to the Society, as he was not a practical photographer; but after further correspondence and the perusal of the report of the previous meeting, which appeared in the photographic and local press, he felt that he could be of some use, as he possessed materials of great interest to anyone compiling the real history of photography. He could not say that he had never used a camera; his achievements hitherto had been very small, owing to his health, but what he could do to forward the progress of photography he would, as far as his health permitted, and through the agency and instrumentality of this Society he thought he could bring forward some things likely to be very useful. He had with him a few specimens of engraving, which, if the Society liked, he proposed to present. They were the outcome of a process invented by his father and produced by Monsieur Dujardin, of Paris, from some very clear transparencies on glass by a French process. These specimens would serve to illustrate the degree of perfection arrived at in 1866, and show that the process can be worked advantageously. Since his father's death there had been a book published by Tissandier, and there was an English translation issued by Sampson, Low, and Co. He did not think this work gave sufficient credit to his father, Fox Talbot, and the English publishers wished his father to write an appendix for the second edition. His father completed two parts before his death, and a third part was completed by himself, but he did not think the book had a large circulation. M. Dujardin wrote to Dr. Parker for a copy of his father's portrait, and that gentleman communicated with him. He referred M. Dujardin to Moffatt, of Edinburgh, where he obtained a print. In subsequent letters he stated a desire to reproduce his father's portrait by his (Fox Talbot's) process, and he wrote him that he considered his father to be the veritable inventor of photography, which was exceedingly pleasing to him, coming as it did from a Frenchman. Still, he should like it to be known that his father and Daguerre were both discoverers of a photography essentially different.

The CHAIRMAN thanked Mr. Talbot for his present, and said he hoped the Society would also receive a portrait of Fox Talbot, which was kindly promised.

FRIESE GREENE said the examples of photo-engraving, just

presented by Mr. Talbot, were quite equal to any platinotype or other process now worked. He heard it mentioned the other day at the Royal Society that Fox Talbot's paper on lenses, read before that body, contained so much that was valuable to opticians that photographers would do well to study it now.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The usual weekly meeting was held on the 27th ult., W. CORN occupying the chair.

S. G. B. WOLLASTON announced, in reference to his friend's dark slides that had caused so much trouble by fogging plates put into them, that varnishing the slides had proved a complete remedy.

J. PEASGOOD, who had recently returned from a visit to the Royal Cornwall Photographic Exhibition at Falmouth, spoke of the number of exhibits, and the large proportion of superior work the exhibition contained.

A. COWAN, to illustrate the suitability of the hydrokinone developer for chloride plates, proceeded to develop a transparency, the exposure having been previously made with three inches of magnesium ribbon burned close to a superimposed plate. The developer consisted of—

Hydrokinone	...	...	...	2 grains
Sulphite soda	...	...	...	10 "
Washing soda	...	...	...	10 "
Bromide potassium	...	...	...	1/10 grain

A few seconds suffice to complete development, any amount of density being obtained by continuing the development. A plate was then developed in full gaslight, which, after fixing, was perfectly brilliant and clear, the subject of burnishing being under discussion.

W. PRESTWICH said the operation was extremely simple; a little Castile soap was rubbed over the surface of the print with a piece of flannel, and the print was then passed through the burnisher.

The CHAIRMAN, remarking that the bar was the weak part of the machine, said he had given directions to a local engineer to make a bar specially for him; he had experienced no difficulty in working the machine since.

To enamel a print, W. PRESTWICH took a plate that had been rubbed over with talc, and coated it with collodion; when the collodion had set, a coating of gelatine was flowed over it, the plate was now brought into contact with the print under water, squeezed together, and allowed to dry.

A. COWAN thought that the print and collodionized plate were more generally brought into contact in a solution of gelatine.

J. J. BRIGINSHAW asked if it was the experience of the members that encauled prints were rendered more permanent by the process.

A. COWAN said he believed not.

A question from the box was read—"What is the best method of storing negatives?"

The general opinion of the members present was for storing negatives in envelopes.

P. CEMBRANO kept his negatives in envelopes, the flap of which was numbered, corresponding with a number kept in a book for the purpose. By this means a negative was easily found.

J. T. LEMON was elected a member of the Association.

#### LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting was held at the Royal Institution, Colquitt Street, on Thursday, the 27th ultimo, B. J. SAYCE in the chair.

F. Kelly was elected a member of the Association.

The Hon. SECRETARY read a letter from Mrs. Houghton, acknowledging the vote of condolence upon the death of E. P. Houghton, passed at the last meeting.

The PRESIDENT announced that a report of the recent Exhibition, showing a balance in hand of over £250, had been presented by the sub-committee; this, when passed by the auditors, would be printed and placed in the hands of the members by the next meeting.

Mr. SAYCE then opened the discussion on the relative merits of large and small sizes in photography, by claiming for negatives of size not exceeding half-plate, the advantage on several grounds, among which were—The smaller area required for manipulating and developing the smaller size; the less cost of apparatus, plates, development, &c.; the greater risk of carrying and handling large plates; the lightness and compactness of



carriage; the greater range of subjects suitable to small plates, and ease of enlarging any subject without artistic loss; less disappointment in case of failure; difficulty of disposing of a great number of large prints, as wall space is quickly filled with large sizes; convenience for mounting in albums; greater ease with which the entire subject is embraced by the eye; equal chances of honours, as shown by exhibition records (at our own Exhibition the highest honour, a gold medal, was gained by a picture little exceeding half-plate); and, finally, whilst it was largely a matter of individual choice, he desired to elicit a variety of opinions rather than to discourage any one who desired to work larger sizes.

W. ROGERS contributed to the discussion, as showing the workability of large sizes, some fine instantaneous pictures taken by Mrs. Rogers, 18 by 12, taken direct, with lens working at  $f_{15}$  and instantaneous shutter.

Dr. G. A. KENYON spoke in favour of large sizes, but they should be treated as a painter does a canvas, not paint a dozen in an afternoon, but spend time and thought over them; a large picture was better worth taking when trouble had been expended.

H. N. ATKINS favoured the small plate; he thought taking of many small pictures tended to cultivate the power of observing and the artistic faculty. He explained the ease with which a half-plate could be enlarged at least four diameters without loss, and described the method of illumination he employed with artificial light at very small expense.

R. CROWE thought there was an advantage in sizes larger than half-plate for exhibition, as the large sizes commanded more attention.

W. A. WATTS advocated the large size, on the ground of the greater value of the picture. He pointed out that the increased weight could be avoided without inconvenience by the use of Eastman films, and claimed that the difference of weight, trouble, and cost could be neutralised by taking fewer pictures and expending more time and trouble upon them. He urged that quality was to be preferred to quantity, and that one or two large pictures was better worth taking than a dozen or two small ones without much time for selecting subject and composition. It was quite as easy to enlarge from whole-plate as half-plate, and the result was much more valuable.

J. H. DAY, as a worker of a large size, would be very sorry to return to the small plate; there was a charm about a large negative taken direct which no enlargement could give; and, after using a large camera, he thought the physical labour was abundantly repaid by the results.

B. BOOTHROYD had tried various sizes, from small to large and back again, and had finally settled down to the smaller size, on the ground of greater convenience.

The PRESIDENT put the question to the vote, with the result of a decided majority in favour of half-plate or less.

Mr. ATKINSON sent for exhibition a selection of beautiful pictures of Rome and other subjects, some taken on wet collodion plates, 3 feet by 2 feet, direct, with rapid rectilinear lens, and printed on ordinary albumenised paper. There were also some very effective groups, remarkable for the artistic character of the lighting.

Mr. HARRISON-DEARLE exhibited a detective camera made up in the form of a hand-basket.

## Talk in the Studio.

THE CAMERA CLUB.—The following arrangements are announced:—Monday, Oct. 8th, 8 p.m.—Opening conversation and smoking concert. Monday, Oct. 8th—Opening of Camera Club Sutcliffe Exhibition; visitors who are not members may be admitted on presentation of card; exhibition to last about two months. Thursday, Oct. 11th, 8 p.m.—Printing-out platinum paper, and a comparison of platinotype processes, by Mr. F. de Paula Cembrano. Thursday, Oct. 18th, 8 p.m.—Lantern evening. Thursday, Oct. 25th, 8 p.m.—Lyonel Clarke on "Printing Density of Negatives." Thursday, Nov. 1st, 8 p.m.—H. M. Elder will open a discussion on "Toning," including the toning of bromide and other printing papers. Monday, Nov. 5th, 8 p.m.—Smoking concert.

PHOTOGRAPHIC EXHIBITION AT KEIGHLEY.—An exhibition will be held in the museum of the Keighley Mechanics' Institute during the week commencing Monday, January 7th, 1889, and the exhibition will include both amateur and professional work,

while representative judges will award silver and bronze medals and certificates. The conditions are as follows:—All pictures must be framed and mounted. No oval or Oxford frames will be admissible. The committee will undertake to unpack, repack, and deliver exhibits to the carriers for return at the close of the exhibition, and will, by engaging professional assistance, use the greatest care; but, at the same time, the committee will not hold themselves responsible for any accident which may occur. Under no circumstances will the exhibitor's name and address be permitted on the front of the frame. The title only of the picture may appear on the front of the exhibit. All particulars must be attached at the back of the frame for insertion in the catalogue. The committee reserve the power to reject any exhibit which may be sent in. No picture which has received a first prize at any previous competition shall be eligible for competition in any class except class 13. In the amateur classes the photographs must be entirely the work of the exhibitor—exposing, developing, printing, and toning. In all cases of enlargements and enlarged negatives, a print from the original negative must be affixed in the corner of the frame, and in the case of retouching the same to be stated. The entrance fee for one class only will be 1s., and 6d. for each additional class. A charge of 2s. 6d. will be made to each exhibitor of apparatus and trade requisites. Fees to be remitted with application for space on the attached form A, not later than Monday, December 17th, 1888. No extra entrance fee will be required for classes 14 and 15, but photographers intending to compete in these classes must specify the same on form B. All pictures must be addressed "Exhibition," Mechanics' Institute, Keighley, and must be delivered not later than Tuesday, January 1st, 1889; the attached form B being sent by post as a letter of advice. It is advisable that exhibits should be sent as soon as possible after Christmas, on account of the great pressure on the railway companies at that time of the year. The awards of the judges shall be in all cases final. On all exhibits sold a commission of 10 per cent. will be charged. Prices to appear in the catalogue. Communications requiring a reply must contain a stamped and addressed envelope. The committee reserve the power to continue the exhibition a week longer than the date specified.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—The subject for discussion at the next meeting on Tuesday, October 16th, will be "Home Portraiture."

PHOTOGRAPHIC CLUB.—The subject for discussion on October 10th will be "Stereoscopic Photography," a short paper by J. Nesbitt. Saturday outing at Hampstead (last of season), meeting at 6.30 at "Ball and Bush" for tea.

## To Correspondents.

\* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.1," while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.1."

G. R. MAINPRIZE.—We cannot say with certainty where your fault is, but we are inclined to think that you under-expose.

A. GANDY.—The letter has been forwarded to W. E. Debenham.

ISO.—1. We know of many cases in which he has blundered, but not one in which he has done more. 2. Consult a lawyer. 3. We hope to have an article on the subject next week. 4. About ten grains to each pint of emulsion. 5. We cannot express any opinion.

R. C. B.—Those we saw were excellent, and we fitted one to a camera and were much pleased with it; still we have had no experience with them on tours far away from headquarters.

LEONARD WAINWRIGHT.—It is quite clear that the paper was made far too damp, and we do not think there is any hope of really repairing the damage to the negative. We would suggest the advisability of making a transparent positive from the negative, and then working upon this with pencil or with blacklead and a stump to bring the density of the thin parts up to that of the surroundings. Of course, success in this matter depends entirely upon the manipulative skill of the person who does the work. From the retouched positive you must make a fresh negative.

CHARLES HUTT.—Why not write to the firm in question, and ask them if they can supply the article? Their reply to a question of this sort will be far more likely to be of use to you than any conjecture we can make.

W. D.—The apparatus is not—as far as we know—sold by any commercialist; but the description is sufficiently full to serve as a guide for any skilled workman.



# THE PHOTOGRAPHIC NEWS.

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## MORE ABOUT THE PHOTOGRAPHIC EXHIBITION.

HAVING touched on the main features of the Exhibition in our issue of last week, we now proceed to notice a few exhibits which deserve special mention.

Nos. 4 to 9 in the catalogue form a series of very pleasing views of Continental child-life, by T. Chester Jervis, and of these perhaps the most natural and unrestrained is (No. 5) "Punchinello," a group of children looking at Punch and Judy, while a little farther on we find not only some delightful examples of out-door photography, but also illustrations of the value of the new platinotype process of Pizzighelli—we allude to Nos. 13 to 17, by Harry Tolley.

We now pause to notice (No. 26) "In the Castle Garth, Newcastle," by Lyddell Sawyer, in which the camera looks down a somewhat irregular street, and a buttressed tower is seen through a dim haze in the distance. Indeed, the effect reminds one of what one often sees looking south in Fetter Lane late on a summer afternoon, with the Records Office towards the right, and the crown-like tower of St. Dunstan's looking over the buildings. Sawyer's picture is realistic to a degree, and if it were a piece of handwork, such an artist as Turler himself need not feel ashamed of having constructed it. "A Columbian Musician" (No. 39), by A. E. Oakes, will attract attention, although placed high; the expression of the musician strikes us as being more natural than that of another portrait study—"Santiago" (No. 53), by the same photographer.

Strange, indeed, it seems that such a production as No. 46, "Miss Mary Moore—Mrs. Gratton as Olivia," by H. Barraud, should be shown in a photographic exhibition. It is the figure of a woman standing, and dressed as for out-of-doors, all the sheet, except where the face is, being bespattered with white spots, which we may conjecture are intended to recall the idea of snow. The smoothed and marred face is not bespattered with the white spots, so if we suppose the figure to be standing in a snowstorm, we must suppose a sort of tunnel free from snowflakes between the observer's face and the face in the picture. Every member of the council should remember that he is, in a sense, personally responsible for the presence of No. 46 in the Photographic Exhibition, and we hope that each one will carefully look at it; indeed, we hope that every member, in looking at this exhibit, will feel a desire to do what he can to make future exhibitions really exhibitions of photographs.

In "The Amateurs" (No. 64) we recognise an ambitious effort on the part of Lyddell Sawyer, but which has rather failed than succeeded. The woman at the easel hardly looks as if she were really at work, and, moreover, the scene is too crowded; indeed, to produce a real picture with so crowded a scene would require the genius of a Jan Steen.

Gale's series (Nos. 73 to 83), representing cottage and

country life, is, perhaps, ahead of his recognised high standard; and in B. Gay Wilkinson's photographs, "Under the Haycock fast Asleep," "Home of the Water Fowl," "On the Margin of the Lake," and "The Trysting Place" (Nos. 108 to 111), we have delightful little bits of character somewhat like those of Gale; but the youngster who is supposed to be asleep under the haycock hardly seems to us to be in a natural attitude for sleeping.

Ralph W. Robinson's portrait of a curly-haired girl (No. 121) is a delightful piece of work, unrestrained and natural, and his next best work seems to us to be "Mother's Comfort," in which the girl is attending to her sick mother, the cottage interior being in good keeping throughout. Robinson has several other exhibits, but those mentioned are, we think, most worthy of notice.

As a fine specimen of stream scenery well rendered by photography, reference may be made to No. 171, "Pont Aberglaslyn," by Herbert G. Moberly. The camera looks under the arch of the bridge, and magnificently depicts the reflections and play of light and shade on the other side. This photograph is not only a picture in itself, but is one of a kind likely to be valuable to artists.

In No. 313, "Miss Mary Anderson as Hermione," by H. H. H. Cameron, we have a gem. It is a small picture, and shows but little more than the head, but its softness and delicate modelling render it specially attractive. In looking at "The Sheriff of Hull," No. 373, by G. Cooper, we can quite enter into the spirit of Oscar Wilde's remark that ugliness made its earliest great inroad upon art when the first portrait was constructed. The Sheriff himself is standing sheepishly, and not only looks half-ashamed at being made a clothes-horse for the display of municipal millinery, but is evidently ill at ease in his plumes. We can quite understand a photographer being compelled, by the stern necessity of living, to photograph such an object, but we cannot understand why he should so glory in this sort of work as to send it for exhibition.

John Spiller contributes some interesting examples of the experimental work of Robert Hunt (No. 449), "An Early Cyanotype Print," and No. 450, a frame containing examples of Hunt's Chrysostype process, dated 1852.

Among what one may call the curiosities of the Exhibition, may be mentioned No. 505, "Photographs of the Fireworks at the Alexandra Palace," by W. Davey.

Among the apparatus are some objects presenting novelty or points of special interest, and among these may be mentioned a good many forms of lamp for the magnesium flash-light; but as all essential features of these have been abundantly described in the PHOTOGRAPHIC NEWS, we need not go into detail here. The "Kodak" detective camera of the Eastman Company, and which has been fully described in our columns, is also to be found on the table, together with specimen negatives produced by its means. No. 561 is a nicely constructed print washer



by Perken, Son, and Rayment, in which a water-wheel motor rocks a perforated tray contained in an outer trough through which the stream passes. We have not seen it in action, but have but little doubt of its excellent performance. In this class, and catalogued under the apparatus, we find an album containing a selection of commonplace commercial mounts, an exhibit quite out of place in an exhibition organised by a scientific society, and intended to illustrate progress. There has scarcely been an exhibition of late in which the apparatus department has not been discredited by the admission of some item completely commercialist, like the album of mounts referred to, and in the present case it is to be hoped that the council of the Photographic Society will require some explanation from the gentlemen who acted as a sub-committee for admitting apparatus.

### THE CASE OF DELETERIOUS MOUNTS.

BIDDLE v. FRY—JUDGMENT FOR THE PLAINTIFF.

THIS case, a full report of the hearing of which appeared in the PHOTOGRAPHIC NEWS last week (p. 626), came on for judgment on Wednesday last, at the Dartford County Court, before Mr. Homersham Cox.

The Registrar read the answers of the jury to the questions put to them, which questions and answers were as follows:—

(1) Were the mounts reasonably fit for use if proper care was exercised?

(2) Were the mounts returned in good time?

(3) What damage, if any, has the plaintiff sustained? The plaintiff definitely says, "I cannot say that my business has been affected."

Answers—

To the first question: No.

To the second question: No.

To the third question: £10.

He then stated that he had since received a letter from a jurymen to the effect that after having seen a record of the verdict in a Dartford paper, he begged to say that the intention of the jury was to have answered the second question in the affirmative. This letter was signed by the jury.

Mr. Newson, on behalf of the defendant, submitted that the verdict having been entered it could not be altered. He had never heard of such a thing.

The Judge: What is your application?

Mr. Newson: My application is that the defendant is entitled to judgment on the verdict. If not, the alternative is an appeal for a new trial on the ground that the verdict is against the weight of evidence.

The Judge: I shall enter judgment in accordance with the verdict, and you must then go elsewhere.

Mr. Newson urged that judgment should be entered for the defendants on the ground that the question as to whether the mounts were returned in time had been answered in their favour.

The Judge: I am not sure that the question was necessary.

Mr. Ridley (for plaintiff): I do not think, your Honour, that it was necessary.

The Judge: Then why did you not tell me so?

Mr. Newson: I must move for a new trial.

The Judge: I shall refuse the application for a new trial.

Mr. Newson: I ask leave to appeal.

The Judge: I shall not grant it.

Mr. Ridley: This case being of such importance both to plaintiff and defendant, I must ask for costs on the higher scale.

The Judge: No; I must refuse that. I enter judgment for the plaintiff for £16 3s.

Mr. Newson: Will you allow stay of execution?

The Judge: My opinion is strongly against the verdict. I will allow stay of execution until after next court day.

Some discussion took place on this point, and the Registrar being of opinion that the stay of execution was not necessary to any point which Mr. Newson might wish to raise, a judgment ultimately was simply entered for plaintiff with £16 3s. damages.

### ORTHOCHROMATIC PHOTOGRAPHY.

BY CAPT. ABNEY, C.B., R.E., F.R.S.\*

THE next point which we may consider is the constitution of the orthochromatic plate itself; and here we come to a rather complicated subject, but one which requires great attention in order to fully appreciate the statements which have been made from time to time respecting the value of the process. The real practical photographer is apt to be sceptical as to the value of experiments made with the spectrum. This beautiful band of light is rather looked upon as a toy with which the philosopher and theorist may play, but which really lies outside the field of the truly practical man. Being somewhat of a philosopher myself, and at the same time not being altogether unpractical, I shall nevertheless venture to appeal once more, as I have often done before, to what the spectrum teaches us. The more I experiment the more am I convinced that unless one knows what analysed light will do, one cannot predict with certainty what light as a whole will do. This being my matured conviction, I shall run the risk of my readers skipping a good deal, and proceed.

From what one reads one would almost imagine that the general idea of an orthochromatic plate is, that in some mysterious way it concentrates the sensitiveness of a plate to one part of the spectrum to which it was insensitive before. Now this is false in the highest degree. If an orthochromatic plate becomes insensitive to any part of the spectrum to which the plate when unorthochromatized is sensitive, it shows that the dye employed to cause orthochromatism is cutting off that part of the spectrum, thus preventing its action on the sensitive salt, or that a new sensitive silver salt has been formed which is insensitive to the part to which before it was sensitive. It may be taken as generally true, however, that the new silver salt which is formed bears only a small proportion to the original silver salt; hence, this last explanation may be dismissed.

It may be taken that for a plate to be orthochromatic, in the at present accepted sense of the word, we must have a salt of silver in contact with a dye of some description. Such a dye may be combined with a silver salt, or it may be uncombined. Further, we may take it as an axiom that in the latter case, unless the dye is a fugitive dye, no action will take place. Also, it may be taken as another axiom that only those rays which are absorbed by the dye (or the silver salt formed by it) and by the haloid silver salts (the bromide, chloride, and iodide) have any chemical action on the dyed film, for no "work" can be done on a body by radiation unless there is absorption, be that work the heating of that body, or chemical action on its constituent.

[An orthochromatic] plate may, however, be prepared without the addition of any colouring matter to the salt of silver. In the Bakerian lecture for 1880 I described a modification of silver bromide which was sensitive not only to the blue end of the spectrum, but also to the yellow, red, and dark rays below the red of the spectrum; and it is the silver salt alone in this preparation which is sensitive to the spectrum.]

Now, let us see what are all the possible ways in which a dye can affect a silver salt, taking it that the dye, or its compound of silver, is only acted upon where it absorbs in the spectrum, and that the subsequent special action on the silver salt is confined to this locality. If a dye



chemically combines with a silver salt, as we know that some do with silver nitrate, as I pointed out in the PHOTOGRAPHIC NEWS of 1876, then the matter is straightforward. Light will act on it, as it does on any other organic salt of silver. There may be another combination, however, between a dye and a salt of silver which is in the solid state, viz., the formation of a double salt; or there may be a mechanical combination, such as takes place between alumina and a dye, viz., the formation of a lake. So far as we know, this last combination is not a chemical one, but a mechanical one, though the molecules of each are very close to one another. There is, however, no interchange of atoms, which there is in a chemical combination. Each is still a separate entity, although in close contact. Now, when silver bromide is formed in gelatine or collodion in which the dye is present, the precipitation of a portion of the dye may take place on this principle; as it may when a film is dyed by immersing the plate in a solution of the dye. We have in the case of these lakes a more difficult business to deal with in tracing the action of light than we have when the combination is a chemical one.

Many of the dyes are fluorescent, and if the rays which are emitted by the fluorescent body were of shorter wavelength than the rays producing the fluorescence, then in some instances we might trace the photographic action of those parts of the spectrum which before were inactive to these short waves of light which would lie nearer the violet end of the spectrum than those producing them. Stokes's law tells us, however, that there is a degradation of wavelength, and that the waves of light are increased in length, and not shortened. Hence this explanation fails. Again, too, some dyes which are impressionable are not fluorescent at all.

This being so, we are driven to the conclusion that the action of light in those portions of the spectrum to which the silver salt is *per se* insensitive, must be on the dye alone. The dye being acted upon, the reduced or altered dye being in contact with the silver salt may partially reduce the silver salt by its contact with it, much in the same way that alkaline pyrogallol acid chemically reduces a salt of silver. In other words, the dye in its unacted-upon state is inert, but when acted upon becomes what may be termed a developer. The amount of "developer" in this case must be so minute that the change in the silver salt would be indistinguishable. But it must be recollected that an infinitesimal amount of reduced silver would be quite sufficient to act as a nucleus on which subsequent development can start. When an emulsion is formed in gelatine, ammonia being present, it is asserted that the action of the dye is much more effective. This fact, amongst other things, gives a colour to the developing action being a possible and probable action.

Eder found that the alkalies and carbonates of potassium and sodium did not increase sensitiveness when the dye was added in their presence. In a dried plate these take crystalline forms, and can in no way be compared for efficiency with ammonia ( $\text{NH}_3$ ).

It must be borne in mind that the chloride and bromide of silver both absorb ammonia in a very marked manner, and that even after moderate washing they will hold it to some extent. The alkalinity of the salt, then, is favourable to this developing action.

(To be continued.)

## THE AMATEUR PHOTOGRAPHIC EXHIBITION IN VIENNA.

BY A WANDERING AMATEUR.

ON October 1st was opened in Vienna the Exhibition of Amateur Photography, held in honour of the 40th anniversary of the accession of the present Emperor. This Exhibition is being held in the fine new building known as the Royal Museum of Industrial Art, and has been ex-

citing much interest in photographic circles on the Continent during the last few months. Fortunately, Monday was a glorious day, the sun seeming to shine out with all the greater brilliancy, compensating for the gloom and pouring rain of the previous day.

Owing to the courtesy of the Secretary of the Amateur Photographers' Club I received an invitation card for the opening ceremony. Accordingly I found myself, at twenty minutes to eleven, in the marble paved hall of the Museum. The ceremony itself was fixed for eleven o'clock, and soon the spectators came crowding in, until it was evident there was going to be a very large and encouraging attendance; the executive committee occupied most of the central space in the hall, while the ladies, of whom there were large numbers present, chiefly patronized the gallery.

Punctually at eleven o'clock, the Arch-Duchess Maria Theresa, accompanied by her husband the Archduke Carl Ludwig (brother to the Emperor), arrived; the Arch-Duchess had consented to be the Patroness of the Exhibition, and although last week she was far away in Hungary, yet such is her enthusiasm for the photographic art, and her desire to forward it in any way, that she had travelled back to Vienna in order to fulfil her duties as Patroness of the Society, and to declare the Exhibition open.

On her arrival she was received by the secretary of the Society, Herr Carl Srna, and conducted into the centre of the large hall, where the secretary welcomed her as Patroness of the Society, the object of which he explained, while thanking the Archduchess for so kindly consenting to perform the opening ceremony. The Archduchess then, in a few well-chosen words, expressed her sympathy with the objects of the Society, and her heart-felt hopes for its well-being, and duly declared the Exhibition open. The members of the executive committee, among whom are many distinguished persons, were then introduced to the Archduchess, who was subsequently conducted by the hon. secretary up the grand staircase to the well-arranged rooms above, where the photographs were duly inspected by the Royal Patroness and her distinguished suite, who expressed themselves most pleased.

The Exhibition itself, of which it is at present somewhat premature to speak, as the awards are not yet made, is divided roughly into two portions: 1. The work of amateur photographers; 2. Apparatus and work illustrative thereof for professional photographers. There are a very large number of exhibits in the former class, and some admirable work is shown; the arrangement and hanging leave nothing to be desired, and those to whose lot this difficult task has fallen are to be sincerely congratulated; indeed, they present a pattern in this respect which many of our English hanging committees would do well to copy.

The whole of the amateur portion of the Exhibition is contained in the large room on the first floor, while Part 2 has a spacious room assigned to it on the ground floor. Here are found many contributions from English houses, Marion and Co. notably sending a very comprehensive collection of apparatus, &c.; yet the noted houses are not far behind in the excellence and variety of their exhibits.

Among the objects which deservedly attracted attention is the exceedingly neat little secret camera in the book-form, patented by a Frankfort firm, and taking a charge of twenty-four plates; it is a wonderfully compact little instrument, and certainly deserves its name as "secret."

The pictures, however, naturally attracted the most attention, and the Archduchess was most painstaking in her inspection of everything worthy of praise. The English amateurs are very fairly well to the fore, our best known exemplifiers of the art sending contributions; among these we recognise well-known work by Messrs. Davidson, Harry Tolley, Wellington, and Dresser, the latter contributing a specially clever trio study of a dog, entitled "Waiting," "After it," "Got it!" Harry Tolley's "Derbyshire Stream" is well up to the high standing that he gets for artistic excellence combined with technical skill.



Studies of animals seem very popular just now, and here amongst the English contributors, Mr. Wellington excels. It is only fair to add here that a great deal of old work is exhibited, and to one who has visited most of the recent exhibitions at home, there seems little new from the British Isles. No. 54 is a contribution by Mr. Stevens, entitled "Home Studies, Untouched;" they no doubt are "untouched," but would have been far more worth exhibiting if they had been "touched up." As it is, the grouping reminds one too much of Dr. Alabone's forced figure studies (such as the May Queen) to be pleasing.

Turning now to the exhibits sent by the amateurs of Austria and other countries—such as Belgium, France, and Italy, which latter are all fairly represented—what strikes one most is the popularity, firstly, of large sizes (10 by 8 and upwards); and secondly, of very small sizes, notably of instantaneous work with hand cameras. I may here note, too, the number of specimens printed on Liesegang's Aristotype paper, which ought to be more popular in England than it is at present. Here it seems to take the place of bromide papers. No. 165 is one of the curiosities of the exhibition. It consists of three prints on Pizzighelli's platinum papers from negatives of sepia drawing, the object being to show how accurately the colour of a sepia drawing can be reproduced by this process. The effect is good, but then one does not often want to copy sepia drawings by photography. The Archduchess herself exhibits some good work. She excels in portraiture—a rare accomplishment amongst amateurs.

The most beautiful photographs in the exhibition, to my mind, are those numbered 25. They are large-sized views, chiefly of mountain scenery, in which the atmosphere, haze, clouds, shadow, and sunshine are rendered with the most perfect gradations. Not having a programme I was unable to ascertain this contributor's name; he is in the first rank of amateur photographers. Other landscape studies of merit are contained in four frames numbered 94, G. V. Kammiserla, chiefly views in the Dolomite region, printed on Liesegang's paper. No. 32 frame contains some first-rate instantaneous studies of dogs jumping and performing various tricks; one of a dog being thrown out of a window is most grotesque. The shutter used must have been of fabulous quickness, for in none of these pictures is any movement perceptible. The exhibitor's name is Johann Hiller.

Monsieur Colard (No. 28) exhibits a genre picture entitled "Deux Sœurs," which might have been admirable if it had been printed lighter. As it is, the faces of the two children are almost black. No. 106 frame contains some views of forest land near Vienna. These are platinum prints, and are characterized by great breadth of artistic treatment. No. 61 is an admirable study of two Arabs, taken on board a Mediterranean vessel—a young man leaning against the bulwark of the ship, and by his side a patriarch with a long flowing white beard. The contrast of youth and age between the two faces is what constitutes the charm of the picture. The composition is, however, slightly spoiled by the presence of a third head right at the bottom of the picture, which is evidently there by mistake. The contributor is Herr Schwarz, of Prague. No. 8 frame contains some "arrauged pictures" after the manner of Mr. Robinson, of Tunbridge Wells, only much simpler, illustrative of the dangers of chamois hunting. Grouping and technical skill are here combined to produce realistic work.

In ending this slight critique, in which I have not mentioned a half of those who are entitled to praise, I can only add that my criticisms would have been more pleasantly conducted if I had had a catalogue to tell the names of the artists. As it was, I presume they were not published in time. Anyway, the amateurs of Vienna are to be congratulated on an exhibition which is quite up to the mark of any yet held in England, and which in many points, notably arrangement, surpasses those at home.

## NOTES FROM NEW YORK.

IMPROVED FLASH LIGHT LAMPS—PLATE-CHANGING ATTACHMENT FOR SMALL CAMERAS—A PHOTOMETER.

A VERY interesting special meeting of the New York Amateur Society took place on Friday evening, September 21st, and was devoted principally to the exhibition and demonstration of new apparatus. President Canfield opened the meeting by introducing Dr. J. J. Higgins, who read a paper on the "Magnesium Light," and also made some remarks on a "New Dry Battery." He exhibited a new lamp very neatly made, designed for flashing magnesium powder something on the principle of the James lamp, that is by forcing a given quantity of magnesium powder up through the centre of a large circular flame from an alcohol lamp by means of compressed air.

He used two bulbs on a rubber pipe, one acting as a storage bulb to hold the air forced in it by five or six compressions of a smaller end bulb. Between the storage bulb and lamp was a spring clip or clamp which closed the pipe. To make an exposure the clamp is opened by light pressure of the fingers, when the air pressure at once sends up the magnesium (deposited in a thimble-like reservoir in the centre of the lamp) into the flame, producing a very long and dazzling flame. He connected two lamps with one pipe by a T, and made them flash simultaneously, which was very successfully done. In photographing a theatre two extra large lamps, holding each an ounce of magnesium powder, should be properly located and connected with any required length of tubing (on the same plan) to an ordinary bellows placed on the floor. To flash the lights compress the bellows suddenly with the foot. The idea is very simple but effective.

The dry battery was quite small and compact; two or three cells were powerful enough to ring a system of bells in a house for three or four years without attention. It was also a very light battery, and could be readily carried in the pocket; it was therefore well adapted for operating the shutter of a camera at a distance. It has about the same power as the well known Le Clanche Battery, and is named the "Gassner Dry Battery." The doctor's tests were very satisfactory; four cells would run a small electric lamp nicely, and this fact suggested to the President that the battery would be utilized in working a dark room electric lamp.

Dr. Piffard then exhibited a new form of portable flash-lamp that was compact enough to be put in one's pocket. In a small tin box without a top, about the size of a sardine box, was packed a lot of wicking, saturated with alcohol. At one end was a table or small vessel, to hold the magnesium powder, and secured to the box, back of this, was the metal tube of a rubber pressure bulb. The whole was so light that it could be held in one hand by the pressure bulb. Squeezing the bulb forced the air through the magnesium, carrying it into the large body of alcohol flame, producing, as a consequence, a brilliant light sufficient, so the Doctor said, to readily take a portrait. Its chief advantage was that it was portable, light, and inexpensive. A tin cover fitted over the wicking to prevent evaporation of the alcohol. It should be mentioned that several excellent prints of interiors made by Dr. Higgins' lamp were passed around, proving beyond a doubt all that he claimed.

Mr. Beach exhibited an attachment for changing plates in small cameras for instantaneous work, invented by George H. Hopkins, of the *Scientific American*. It was simply a paper leatherette bag strengthened by leather bent on itself near one end. Attached to the back of the camera was a metal pocket-like frame, with weak flat springs to force the plate into the focus plane. The top end of the frame has a metal lip. To insert a plate the mouth of the bag is hooked over the lip of the frame, then the bag is turned up the same as if one was upsetting or emptying a bag, and by a little shaking the plate drops from the bag into the pocket of the camera. The bag is



then turned down and held in place against the rear of the camera. There is a rotary shutter and also devices for making a time or instantaneous exposure. The camera is very easily and cheaply made, and the bag system, Mr. Hopkins claimed, was much more simple than miniature plate-holders.

Mr. Beach then showed a photometer made by J. Decondun, of Paris, for determining the correct exposure. It is placed against the ground glass of the camera, and an inside disk having four holes in it (one much larger than the other three) is rotated until the three small holes appear to merge together. It is then removed, and a reading, taken according to the letter of the alphabet, brought to view. He had tested it in reducing with camera for lantern slides, and found it quite reliable. For an Eastman or Ripley slow lantern slide-plate he exposed about one-tenth longer than the time stated on the photometer.

Mr. Stebbins remarked that he had good success in using a similar device.

Mr. Beach read a paper on "A New Detective Camera," exhibiting a model of the Kodak recently introduced, and followed his paper by an exhibition of a few lantern slides on the screen, these having been made by contact from Kodak film negatives. They were excellent in their way. He also exhibited a series of interesting enlargements made by the Eastman Company, which were remarkably clear and distinct, when it was seen that they were made from such miniature negatives. The little camera was considered quite a novelty, and excited much interest among those present.

Dr. Piffard made some exhibits of his recent orthochromatic work which were interesting. He showed prints from orthochromatic negatives and the original coloured miniature which had been copied. The true relation of colours was very plainly seen. His process was similar to Ives' recent method.

So many things of scientific and practical interest have rarely been compressed into one meeting of the Society, and it was greatly enjoyed by all who attended.

The President read a paper by Jos. P. Beach on "A Method of Reducing Blue Prints," also a report of the lantern slide committee, stating, in substance, that the American Lantern Slide Interchange had been duly organized in July, and that the executive committee to conduct it was George Pullock, Manager, residing in Cincinnati, Ohio, assisted by Edmund Stirling, of Philadelphia, and F. C. Beach, of New York.

The committee urged upon members the need of getting slides together for the Interchange.

The next regular meeting of the Society is set down for October 9th, and the first lantern exhibition of the season for October 26.

The third annual exhibition of the New York, Philadelphia, and Boston Societies, will probably occur early next spring at Philadelphia, and it is hoped will be liberally patronized by foreign exhibitors.

*New York, Sept. 29, 1888.*

SULPHITE.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN B. GUNTHER.

NATURAL SCIENCE EXHIBITION OF COLOGNE—ORTHOCHROMATIC COLLODION EMULSION—PLATINOTYPES—  
—TONING BATH FOR ALBUMEN PRINTS—CONCENTRATED SODA DEVELOPER.

*Natural Science Exhibition of Cologne.*—The sixty-first annual meeting of German naturalists and doctors took place at Cologne from September 18th to the 23rd. For the natural exhibition opened on this occasion photography was again ably represented. It was attached to Class II., Micrology; and, indeed, by far the greater part of the exhibited pictures consisted of photo-micrographs. Mr. Reithert, of Vienna, and Dr. H. Burstert, of Berlin, sent a splendid collection of them, the latter showing sections

of German timber which were highly instructive. Dr. P. Jeserich, of Berlin, exhibited a beautiful collection of eighteen tables illustrating the application of photography for scientific purposes. They were divided into two series. The first contained photo-micrographs of enormous magnification, amounting to 6,200 diameters, which were all taken by limelight. The pictures were of perfect clearness and sharpness. The second series consisted of photographs illustrating the method with which Dr. Jeserich succeeds to identify, by aid of photography, such interpolations and forgeries which are absolutely unperceivable with the naked eye. In the photographic copy the slightest differences in colour and shade of inks are made manifest. Blue inks appear nearly white; brown inks, on the contrary, almost black. In this way a merchant was, for instance, convicted by Dr. Jeserich of crooked ways in keeping his accounts. He took off the pages of the books concerned, and brought into court the most undoubted ocular proofs of the illegitimate after-entry of some of the accounts. A subsequent chemical test substantiated this evidence. In another case, the changing of the date of a note by an insignificant erasure and addition was proved in this way by the doctor. Most perfect apparatus for photo-micrographical purposes were sent by the well-known factories of C. Zeiss, of Jena; Leitz, of Wetzlar; and Jung, of Heidelberg, which attracted much attention. An original exhibit was that of the druggists Lipmann and Geffeken, of Hamburg, which consisted in a collection of about one thousand large photographic views of different parts of Asia, showing all the places with which the firm has business connections. Of the many photographic apparatus I observed, I will only mention Dr. Krugener's book-camera, sent by Haake and Albers, of Frankfurt, together with the additional enlarging apparatus, Stiin's well-known waistcoat camera, a collection of tourists' cameras of Janssen and Co., of Cologne, then the excellent photographic outfits of Ed. Liesegang, of Dusseldorf; O. Schroeder, of Berlin; and of Paul Leinert, of Dresden. To those interested in spectrography the natural exhibition offered special attraction, this branch of science being very ably represented. A. Kruss, of Hamburg, showed a large spectroscope with six prisms and automatic focussing arrangement, also a very ingeniously constructed universal spectroscope for qualitative and quantitative analysis, with symmetrical slit. Geissler, of Bonn, exhibited some splendid Rowland diffraction gratings, showing 14,438 parallel lines to the linear inch, giving the most beautiful spectra I know. The next annual meeting of the German naturalists will be held at Heidelberg.

*Dr. E. Albert's Highly Sensitive Orthochromatic Collodion Emulsion.*—Some months ago, Dr. Albert, of Munich, published in the various photographic journals a communication about his orthochromatic collodion emulsion, which, as the author says, shows itself to be as rapid as gelatine emulsion, the plates prepared with it requiring no yellow screen during exposure. This communication, though it contained no details as to the preparation of the emulsion, excited a great deal of interest, as it was generally known that Dr. E. Albert, in his reproduction establishment, takes all his unsurpassed copies of oil paintings with orthochromatic collodion bromide emulsion. Meantime Dr. Albert has placed his emulsion on the market, and it is said to sell readily. It is furnished in two separate bottles, one containing the collodion emulsion, the other the eosin silver solution, by which the emulsion is made colour sensitive. In the eosin silver the ammonia used for dissolving it has been neutralized with picric acid, as it would otherwise act destructive on the cotton-wool, and give rise to fog. The picrate of ammonia formed thereby gives at the same time the colouring matter, which absorbs the too powerful quantity of the ultra-violet rays reflected by blue pigment colours, which, according to the author, is the cause that in photographs yellow appears much darker than blue. The collodion emulsion, which in the unmixed



state keeps for months, is made colour sensitive just before use, by adding 10 c.c. of the eosin silver solution to 100 c.c. of the emulsion. Before and after adding it, the emulsion must be violently shaken. In the mixed state the emulsion is much more sensitive to white light, and also to orange, yellow, and green colours; but as it keeps in this state only for one or two days, it must be utilized the same day it is mixed. If filtering should be necessary, it may be done through cotton-wool moistened with alcohol. The mixed emulsion must be carefully protected against yellow light. The plates are best prepared at the light of a red dark room lantern. In order to retain the film the edges are painted with an alcoholic solution of gelatine, made from so-called "meta-gelatine,"—that is, gelatine changed by ammonia. As soon as sufficiently set, the plate should at once be exposed without being washed before, in a room of not too high a temperature; it will, however, in the wet state, also keep for twenty to thirty minutes. After exposure the plate is washed under the tap in dim red light, until all greasiness has disappeared, then it is allowed to drain, and then developed. For this purpose the plate is held in the hand, and the developer poured over it. For the concentrated developer Dr. Albert recommends the following formula:—

Distilled water	...	...	4080 c.c.
Sulphite of soda	...	...	474 grammes
Bromide of potassium	...	...	300 "
Bromide of ammonium	...	...	80 "
Citric acid	...	...	53 "
Pyrogallie acid	...	...	132 "

For use, 100 c.c. of this solution are diluted with 1000 c.c. of diluted water, and 20 c.c. of ammonia (spec. w. 0.91) added to it. In the concentrated state the developer keeps for an unlimited time; the diluted developer, however, should be mixed for only a day's requirement. As soon as it becomes brown it is useless. In the case of over-exposure, a few drops of a solution of 5 grammes potassium bromide in 100 c.c. of water are added to the developer; in the case of under-exposure a few drops of a mixture of 100 parts of water and 100 parts of ammonia. Excellent results with this collodion emulsion are given by the hydroquinone developer, which can be highly recommended. In this case the hydroquinone gives strength, the ammonium bromide clearness, and the potassium carbonate sensitiveness. To determine the sensitiveness of Dr. Albert's collodion emulsion plates, comparative trials have lately been made by Dr. Eder in the portrait studio of the Imperial Teaching Institute of Vienna, at the same time, with good gelatine dry plates of commerce, of 19° to 20° of Warnerke's sensitometer. The time of exposure was found the same in both cases, namely four to six seconds.

*To Impart a Beautiful Brown Tone to Platinotypes.*—According to a communication of M. Taeschler-Signer, in the *Rundschau*, a beautiful brown tone may be imparted to platinotypes, if to a hot solution of potassium oxalate a solution of bichloride of mercury is added before development.

<i>Solution A.</i>			
Potassium oxalate	...	...	295 grammes
Water	...	...	1,000 c.c.

<i>Solution B.</i>			
Bichloride of mercury	...	...	5 grammes
Water	...	...	100 c.c.

Solution A is warmed up to 158° to 176° F., then solution B is added. According as more or less bichloride of mercury is added, the tone may be altered from the common greyish-blue to brown, even to sepia colour. This method may be a good one for those who prefer the brown tone to the dull engraving colour of platinotypes, but to my mind the permanence of the pictures will run risk by adding mercury bichloride. It is well known to photographic operators that negatives having been intensified by means of bichloride of mercury and ammonia, after

continued exposure to light, after about eight days, commence to bleach if looked at by reflected light.

*Excellent Toning Bath for Albumen Prints.*—The following is recommended by Jas. Bourrier, in the *Amateur Photographer*:—

Distilled water	...	...	1,200 c.c.
Carbonate of soda	...	...	5 grammes
Benzoic acid	...	...	10 "
Gold chloride (brown)	...	...	1 gramme

No other gold bath has given to the author such beautiful, warm, velvet-like tones as the above, which has also the advantage to keep very long. The natural benzoic acid, produced of gum benzoin, is, however, rather dear, whilst benzoic acid "Extolul" (a compound of the coal-tar oil) is much cheaper, and as good as the natural one. The benzoic acid being lighter than water, floats upon the latter, and the bottle in which the gold bath is made must, therefore, often be shaken, to cause the crystals to dissolve.

*A New Concentrated Soda Developer.*—In the *Mittheilungen*, Max Wolf describes a modification of the concentrated soda developer, which is said to give very clear pictures, and very seldom to cause frilling of the film. Two stock solutions are prepared as follows:—

#### *Stock Solution A.*

Water	...	...	100 c.c.
Sulphite of soda	...	...	30 grammes
Concentrated sulphuric acid	...	...	5 drops
Pyrogallie acid	...	...	10 grammes

It is essential that the dissolution of these ingredients be made in the order given above, as the pyro at once oxidises if it comes into the water before the sulphite of soda. It must also not be filtered.

#### *Stock Solution B.*

Water	...	...	200 c.c.
Soda, crystallized	...	...	75 grammes
Sulphite of soda	...	...	40 "

This latter solution must be filtered. For use, take—

Water	...	...	100 c.c.
Stock solution A	...	...	3 "
Stock solution B	...	...	4 "

It is not necessary to use an alum bath after development, but if used, it protects against frilling and yellow stain. In placing the negative into the fixing solution the lights become quite dark. Addition of potassium bromide acts in the same manner as with the potash developer. The stock solution A may as well be used for the potash developer as for the soda developer.

## PHOTO-MICROGRAPHY.

BY F. CHARTERS-WHITE.\*

To many who are now present the re-iteration of my remarks on photo-micrography may, I fear, be as wanting in novelty as a thrice-told tale, but I was encouraged to take my part in the proceedings of this evening by the suggestion that in accordance with the published invitation many provincial visitors to the exhibition of the Photographic Society might accept this club's hospitality, and make use of its meetings during their stay in the Metropolis, and to them photo-micrography might be of sufficient interest to induce them to take up its practice, if its initial difficulties were shown to be as easily overcome as they are. Especially does the season now offer its inducements for the trial of this fascinating branch of our art—the dark curtain of non-actinism limits the prosecution of landscape work, but we can always find interesting occupation during the long winter evenings in photographing simple objects by means of the microscope, or even a microscopical objective. But my time is limited, and my introduction of my subject must not be so long as to encroach on that in which we hope to listen to the experiences of other workers who may be present.

The division most convenient resolves itself into three parts,

\* A communication to the Photographic Club.



on each of which something must be said ; these are—the light employed, the apparatus used, and the development of the plates.

First, the light employed. The beginner at this process will, if he takes my advice, go in for low power photo-micrography—that is, never using powers higher than a one-fifth of an inch, or even better, a one-third of an inch, while he may go to as low a power as a one and a-half inch microscopical objective. This will give a sufficient range of amplification, and for this a paraffin lamp having a wick three and a quarter inches broad will give ample lighting if the flame be turned *nearly* edgewise to the objective ; the light may be made more actinic by putting a piece of camphor as large as a filbert into the reservoir of the lamp. But when sufficient progress has been made, and good negatives are obtained with low powers, then the beginner—no longer a beginner—may proceed to the use of the higher powers of the microscope, such as the one-eighth, one-twelfth, and one-twentieth ; but then the light will have to be either the electric arc or the Oscey hydrogen to get anything like favourable results.

One point of great importance must be touched upon here, whatever illumination is used, and rays of light must evenly illuminate the object. If a condenser is employed, it must be accurately centred, so that the field derives an equal lighting ; if this is not done, two undesirable results will make themselves manifest—the resultant print will present one part of its field dark and the other light, one being beautifully and softly vignetted into the other, and, in addition, one edge of the object photographed will be blurred by diffraction and show a white bordering, while the other does not ; this is especially evident in photographing diatoms with high powers, so the first care of every beginner in photo-micrography must be devoted to remove this liable source of error. Then, again, it is possible to have too much light, drowning all the details of your object ; having therefore a steady white light, the excess of it should be cut down by diaphragms or stops till only sufficient is left to do the work required, a longer exposure being given if necessary. No material benefit in my experience has arisen from the use of a monochromatic light such as that furnished by the ammonia sulphate of copper bath, interposed between the lamp and the condenser ; but this is a point which might be carefully noted by future workers, as also the use of a pale yellow glass in photographing parts of the exo-skeleton of insects or objects presenting varying shades of brown. In photographing these, the brown offers such a non-actinic barrier that before the rays of light have passed sufficiently through them to affect the bromo-silver in the plate, the general field is hopelessly over-exposed. If, therefore, a stained glass of a shade approximating to that of the object be employed, it is possible that the action of light on the field might be kept back till the image of the object had made its impression ; it lengthens the exposure, but I am under the conviction that it will be of marked benefit, and worth a trial by those who have the time, the talent, and the inclination for this kind of investigation.

The apparatus employed may be reduced to a horizontal microscope whose nozzle can be thrust through the lens hole of any ordinary photographic camera, the junction being rendered light-tight by a swathe of black velvet, the conjoined apparatus being securely mounted on a firm base-board ; but a reference to the number of the Transactions of the Royal Microscopical Society which I have laid on the table will show the wonderful field for the exercise of inventive genius this subject affords us, evidenced in the varying plans which have been devised for bringing about the union of these two hitherto divorced instruments—the camera and the microscope. It therefore resolves itself in this : “ You pays your money (and don't be too stingy) and you takes your choice.” The apparatus I most favour is that devised by myself ; of course, every old hen thinks her chicken the most elegant, and I think that my bantling for my purpose is the best that could be invented, but, unlike the old hen, I have thought it needed improvement, and have added and altered till it presents a different appearance to what it had when first born. I pass round for your inspection some photographs of it in its second and third stages of evolution ; what it will eventually be lies at present in the dark womb of futurity, but doubtless, as needs arise, it will be modified to meet them. The photographs of the apparatus in its last development speak for themselves, I think. I did very satisfactory work with the machine as arranged in photograph No. 2, in which a microscopical objective played the *role* of the lens of an optical lantern, and projected the magnified image of the object on to a sensitised plate ; but it needed a carrier for the object and a focussing arrangement, which was added in consequence ; then a convenient sliding base to support the plate carrier was

rigged up. That was a grand advance, as it enabled me to vary my amplifications. Then I found I had for many objects and low powers too much light ; I was not like Goethe, who wanted more light, I had too much of it, so I fitted a tube behind the object-carrier and made a sliding diaphragm, which could be slipped back till the exact amount of light was obtained. Then I found I wanted a more accurate means of centring the light and more steadiness in the apparatus ; so acting upon a kind suggestion of Mr. Walmesley, of Philadelphia, I discarded my first-born arrangement and set up the modification as photographed in No. 3, and with that I obtain very good results, but not equal to those obtained by such workers in this field as Messrs. Nelson and Pringle ; but we cannot all be giants in these days. There are almost insuperable difficulties to be overcome in this department ; we have to contend against many physical barriers ; but if in the concourse of many workers we can freely communicate with each other and state our difficulties as well as our successes, means may be devised by which these physical obstacles can be ameliorated, if not altogether overcome.

Having our apparatus, the next thing is to have objects suitably prepared, and until the preparers of these objects make themselves familiar with the conditions necessary for the production of a good photo-micrograph, so long shall we be unable to produce the best work. One of these conditions is absolute flatness of the object. Many microscopical preparations, and especially sections of animal tissues, are mounted with their front surfaces presenting several planes, and with such preparations it is impossible to get more than a small portion perfectly sharp. Then, again, these preparations require to be cut very thin, so that the risk of blurring by the back planes is reduced to its minimum. With the thinnest preparations, when using the higher powers, there must be an evidence of this blurring, but not sufficient to force itself on your attention unless looked for. Then they must be suitably stained, but not with what is known as a selective stain, by which the nuclei are picked out and stand out beyond the other details. This is desirable for histological purposes, but nothing offends the eye more than seeing a photograph dotted all over with these spots.

Attention must also be given to the colour of the stain, and in all my work I find a pale yellow stain given by a diluted solution of Bismark brown gives me better results than I can get with the use of other dyes. Carmine, if not of too deep a colour, is also favourable, but very little success can be got from blue or lavender-stained preparations. Having, however, suitable stains, we must also require that the preparations should be perfectly free from extraneous matters, and the field should have no stray particles either of the tissue itself or foreign matter arising from careless and dirty mounting, for such will be reproduced in the photograph, and necessitate a great deal of spotting out in the field. These things are not obtrusive in ordinary microscopical examination, and if they are, they are recognised, and their right value assigned to them, and therefore preparers may be tempted to let them go ; but they spoil the beauty of the negative. There is no necessity for their existence if proper care is exercised, and we may hope that in the future the professional mounter will carefully avoid them, which, doubtless, he will do when the number of workers in this department demand such slides. Having selected such a slide and chosen the portion to be photographed by throwing its image on the focussing screen, it may be there roughly focussed ; the screen may then be removed and its place occupied by a plate of plain glass having some fine lines ruled in cross bars on that side of it placed next the object. On looking through this with the ordinary focussing glass, if set and fixed to the observer's true focus, he will see the cross lines in his field of view sharply defined, then, by means of the fine adjustment of the microscope, he must bring the details of his object into harmonious sharpness with the cross bars which occupy approximately the place of the gelatine film of the sensitive plate, when, with the ordinary microscope objective, this sharpness of detail will be produced on the film without having to allow anything for the correction of actinic or visual focus. Now he will find a flood of light drowning the histological details of his object ; that amount of light was useful in enabling him to select the portion to be photographed, but it is now positively detrimental to subsequent work, and more than is required ; it must, therefore, be reduced till, by means of the focussing glass, he sees the whole area of the object crowded with delicate detail hitherto obscured with the brilliancy of the illumination.

We now come to the exposure necessary to obtain a good



negative with plenty of density in the surrounding field, and here I must say the difficulty will be felt. I believe many defects in obtaining this may be traceable to under-exposure, and it is only by one or two trials that this experience and judgment can be gained; but when satisfactory results are obtained a record should be made of the time of exposure, the objective used, and the amplification obtained for future use, as nothing will be so useful and labour-saving as such a record to refer to.

Of the actual development of such negatives I have nothing to say. The ordinary developers, with whose use all workers are familiar, suffice for this process as much as they do for any other photographic work. But I think that hydroquinone will prove of use, inasmuch as it does not seem to block up fine detail to such an extent as pyro does, but I have not given it sufficient trial yet to allow any opinion I may express to have much weight, but mention it that other workers in this field may have their attention called to this favourable peculiarity, with a view of comparing results and testing if my idea be a correct one.

One advantage of my present photo-micrographic apparatus is that while with the arrangement, as shown in photograph No. 2, I could only get transparent objects to photograph, I can, by the modification shown in No. 3, remove the microscope, and attaching its face to a sliding camera, obtain photographs of opaque objects. In doing this it is necessary to employ two lamps and condensing lenses, the light of one being concentrated on the object, the other being used to soften or obliterate a great deal of the shadow. In photographing opaque objects, I need not say that low power objectives are most usefully employed, as the varying planes of focus are so steep and sudden that they require a lens whose penetration is sufficient to embrace them. It has been suggested to make separate photographs of each of the planes in an opaque object, and then by a species of composite photography combine the negatives in the reproduction of the print; but I have not time enough to pursue these investigations, deeply interesting as they are. Life is not, with me at least, long enough to do all one would like to do, and therefore I cast forth these few crumbs on the waters of your attention, hoping they may bring in the loaves after many days.

### Notes.

As will be seen from our report in another column, judgment in the important case of Biddle v. Fry has been entered for the plaintiff. This decision, we do not hesitate to say, will be endorsed by all practical photographers who have read the evidence. The bearing the result of the case will have upon future actions at law of a similar kind—we hear that others are contemplated—is very evident, and it is not surprising that Messrs. Fry are not satisfied with the verdict, but will endeavour to challenge it.

In the meantime a curious piece of information has reached us, which we give under reserve. It is stated that on the jury was an expert in the manufacture of paper. This gentleman, on examining the mounts in question under a microscope, discovered a number of minute spots which he knew at once to be the seeds of esparto grass. It appears that after the grass is reduced to pulp, it is of the highest importance that the scum, chiefly consisting of the seeds, should be removed. If not, the seeds, which are so minute that they cannot be pulped, remain in the paper and are liable to ferment. If this be so, every photographer knows what the result of fermenting organic matter on albumenised prints will be. This story does not come to us direct from the jury, none of whom we know, and we give it as we receive it. If the statement be not authentic, the verdict will not be affected. If, on

the other hand, it be true, it makes the verdict all the more decisive, and illustrates the fortunate chance of an action concerning photographic cards being tried at Dartford, the centre of a great paper manufacturing district.

The example of the Isle of Wight dog which, as we recorded recently, went into a photographic studio and insisted upon being photographed, has stimulated a cat to go and do likewise. A society journal asserts that one morning a large black tom cat entered a certain studio, bearing in its mouth a tall silk hat which it deposited in front of the camera. After attracting the attention of the photographer it slowly took up a position inside the hat, and carefully posed its two fore paws in a most artistic and pleasing manner. The photographer at once grasped the situation, and obliged the cat by taking its portrait. Those who desire to take the story as a joke are, we presume, at liberty to do so.

“When possible, I reserve my copying for Sunday,” said a city photographer to us, the other day, “as not only is the absence of traffic conducive to freedom from vibration, but the air is clearer than during the week.” We may mention that our friend is a Jew, and rests on his Sabbath.

“The catalogue is one shilling,” said the assistant at a London photographic material store; and then, in response to a look of surprise on the part of the person asking for the price list, he added, “But we deduct the amount from any purchase you may make.” “A purchase I make any time to-day?” “Certainly.” The shilling was paid, and a careful search enabled the customer to select goods amounting to exactly one shilling and a halfpenny, and he retired with the conviction that the tradesman who charges for his price-list does not always fully realise his expectations.

There scarcely seems room to doubt that W. F. Donkin, the Secretary of the Photographic Society of Great Britain, has lost his life in a snowstorm in the Caucasus. H. Fox, of Wellington, Somerset, and Mr. Donkin, left Karaoul on the 30th of August last, two experienced guides being with them, but they have not been heard of since.

Mr. Donkin, as our readers know, was no inexperienced mountaineer; and it is scarcely necessary to allude to his magnificent series of Alpine photographs, which are so well known to photographers.

Some years ago there was a suggestion that photographers might reasonably feel aggrieved because a photograph cemented on a post-card would not pass through the post at the card rate; but those who then wished to utilise the halfpenny post-card are somewhat surpassed as innovators by the Farthing Letter Company, which professes to be able to sell post-cards bordered with advertisements for a farthing a-piece; the balance of the price being contributed by the advertisers.



If such cards should really be sold in the open market at a farthing a-piece, it will probably pay very much better to take them in bulk to the Spoiled Stamp Office at Somerset House than to follow any branch of photography as a profession: but possibly the alternative of printing or painting over the border of advertisements with a thick and opaque white ink—an ink like that used in printing certain kinds of wall paper, and giving, when dry, a surface suited for writing upon—would pay better than taking the cards to the Spoiled Stamp Office, as cards so treated should sell readily enough for a trifle under the usual rate.

A dark slide shown to us by R. L. Allar, of 1, Henry Street, Pentonville, presents some excellent and notable features. The compression catch arrangement for unlocking the draw-shutter when firmly gripped between thumb and finger is especially neat and simple in its design, while the double grooving and tonguing for preventing the ingress of light between the hinged halves of the slides is worth notice as being deep and very narrow. The draw-shutter is doubly hinged so as to turn down over the back of the camera when drawn, and, although very thin, is accurately tongued and grooved at both joints, so that its light-tightness does not depend on the leather hinge.

Our readers will remember R. L. Allen as an old Daguerreotypist—one who left his trade of cabinet maker to follow the new art; but now he has resumed his old occupation as far as it applies to photographic work, and in our previous reference to his ingenious devices, we have intimated that he is a craftsman who personally executes all work entrusted to him.

Few processes are coming into such rapid favour as the new method of direct platinotype introduced by Captain Pizzighelli, and we are pleased to find that another commercialist is putting the sensitive paper on the market. We allude to John D. Ford, of 40, Mount Pleasant, Liverpool. The sample of paper he sends is very uniformly coated, and gives excellent results.

A *Pall Mall* extra on "The Best Trains" is illustrated with instantaneous photographs of express trains reproduced in block form, and the publication is notable as an example of excellent results obtained in the quick and cheap printing of phototype blocks. The pamphlet contains much interesting information as to the great railway routes of the world.

The notice in the *Daily News* of the Photographic Exhibition is unconsciously what the Americans call "high comic." The critic gravely remarks:—"To say that it is not quite up to the usual average is only to echo the verdict of the council members who have not been sufficiently satisfied with the competitions to award the gold, silver, and bronze medals which on former occasions have been liberally distributed." We don't know who will laugh more at this absurd blunder, the council

or the exhibitors. It is almost a pity to spoil the joke by informing the *Daily News* that the council had determined not to award any medals long before it had seen a single picture.

The mistake of our contemporary, however, points a moral. It shows how criticism in photographic matters is done. Naturally the award of medals saved the critic much trouble, because the judges having sifted out what should be the best of the show, he only had to look at the work of the prize winners, and "fake up" his notice. The consequence was that work probably fully equal to that which had gained a medal was passed unnoticed. This is a drawback of the award system not the least grievous of the many drawbacks. We shall not be surprised to find the critics, deprived of the guiding hand of the judges, making a sad hash of their notices this year.

The method adopted by the *Telegraph* to obtain its "portrait" of the Whitechapel murderer is that used by illustrated papers when a notoriety is wanted, and his portrait cannot be obtained. The *Telegraph* confessed to selecting a number of photographs, and, placing them before a person who is supposed to have seen the murderer with one of his victims, had the portrait drawn from the one picked out as most like. This plan, however satisfying it may be to the public, has its drawbacks. The person whose photograph is thus made use of has a right to complain if the likeness places him in an embarrassing position. Fortunately, the *Telegraph's* notion of a face is so unlike anything on earth—and, let us hope, in Heaven—that much harm may not be done.

The difficulties of a photographer in getting a good picture of a mercurial sitter have been well set forth by Harry Furniss, in his lecture delivered at the Birkbeck Institution last week. It is true he referred more particularly to artists, but his words apply equally to photographers. The sitter who complains that he or she makes such a shocking bad photograph is the one who would, in reality, make an excellent photograph if only the right expression could be caught. But this is just what is so rarely obtained. Unfortunately the photographer has no need to adopt the device of Herkomer, who places a "Bradshaw" in the hands of a too lively sitter to sober him. The posing chair and the head-rest are generally effective in a sobering direction.

Photography is rapidly becoming a handmaid to medical science. Every hospital has its photographer—that is to say, some student or doctor who fulfils the function. A step onward has been taken by a new medical journal, the first number of which has been produced with great care and at considerable expense. It intends to make much use of photography, and dwells properly upon its value in illustrating clinical notes. The editor says, "We have found from experience that, however excellently the physician or surgeon may manage his hospital, the note-taking is too often but indifferently done. The system, or want



of system, not infrequently characteristic of case-taking, is to be blamed for this, and we would suggest that no notes of cases admitting of illustration should be considered complete without a photograph illustrating the point of diagnostic or pathological interest." The new journal, we should add, gives a number of reproductions from photographs illustrative of its remarks.

### REDUCING OVER-PRINTED BLUE PRINTS.

BY JOSEPH P. BEACH.\*

A PHOTOGRAPHIC negative having been placed in the frame, under a piece of blue paper, inadvertently remained a long time exposed to sunlight, while the person in charge attended to other matters. The picture was barely discernible, even after the print had been placed for a long time in several changes of water. This print was made into a very presentable picture by a bleaching-out process, which will probably be found very useful to those in whose business blue prints are serviceable.

The above print (which had when dried become almost blue-black in all parts) was laid upon a clean platter (a piece of glass will answer). Water was poured upon it until the paper again became limp and pliable. The water was then drained off, and upon the face of the print was poured a small quantity—a drachm or less—of old pyro and potash (Beach) developer, flowing it over all parts of the print as evenly as possible, keeping the fluid moving over the surface of the print until the latter had assumed a violet hue. In this case it was a very dark violet hue. Repeating this with a new dose of "old developer" did not seem to lower the intensity of this dark violet tone, so the print (now of this colour) was washed thoroughly on both sides for some moments. The print was then flowed with a small quantity of saturated solution of oxalic acid. The acid was allowed to run over every part, which immediately assumed a beautiful light green colour changing to blue, after washing in several changes of water. The well washed print, after being dried, had turned out a very presentable object, nearly every detail quite perceptible, and although the whites were still blue in colour, they were no longer almost invisible, but quite pronounced. The texture of the paper in this print had, however, suffered, from the prolonged washing probably, or the oxalic acid. Other experiments were made, using acetic acid, vinegar, citric acid, &c.

Subsequently I reduced this process to substantially the following *modus operandi*, which I have now employed successfully in a great many instances, even after the prints were mounted, in preference to having among my collections prints which offended the eye by too deep a blue colour. The print to be operated upon is first placed in a suitable vessel, and soaked with clean water until pliable. The water being drained off, half a drachm, more or less, of old pyro and potash (Beach) developer—enough to thinly cover the print—is next flowed over, and kept in motion by rocking it over every part of the print. This will occupy but a few moments, but should be continued until the picture has assumed an even violet hue, a dove, or mouse colour. When the eye is satisfied that an even colour has been obtained, instead of pouring off the developer (which would leave streaks of colour), fill the dish with clean water. This removes the developer uniformly, and then the dish may be emptied. The print should now be washed in clean water for a minute or two on both sides, and all surplus water drained off.

The next operation is a very beautiful one. The wet print is quickly flowed with a small quantity of acetic acid; a few drops sometimes is enough. The acid must be moved over every part of the print, which immediately changes the violet or mouse colour into a lively green, more or less bright, according to the previous action of the developer. The green colour afterwards becomes blue. The acid should not be allowed to remain more than a few seconds on the print, which is then washed thoroughly for a few minutes, and afterwards placed to soak in a dish of clean water. In half an hour, or after several changes of clean water, the print may be dried between blotters, or by hanging up in the usual way.

The entire operation occupies only a few moments, and if a good quality of paper is used the prints are not injured.

\* Read before the Society of Amateur Photographers of New York.

After the prints have once been operated upon, they can be repeatedly put through the process, but it is needless to say that every repetition causes the fibre of the paper to rise and rebel against so much disturbance of its tissue. A little practice and deft handling will enable the operator to bleach his prints and turn them out in almost as good a condition as if they had been properly printed in the first instance. I have experimented in various ways with different solutions, and give the foregoing as the best results I have found after many trials. The specimens will show that acetic acid as a fixing agent is preferable to anything else that I have used.

#### *Alterations in Blue Prints, or for Writing upon Blue Prints.*

After many experiments I have found that the ordinary No. 2 solution of potash and soda (Beach's) developer is a good ink with which to write upon blue prints. This writing must be done with a gold pen, upon the dry print, and suffered to dry. The print is then washed in clean water. It will now be found that an edge of violet colour, extending sometimes a quarter inch into the adjacent parts, mars the clearness of the lettering. This is speedily removed, and the writing brought to a clear white by flowing with a few drops of acetic acid.

For stopping-out clouds and other parts of a blue print, a fine sable hair brush, dipped in the solution (No. 2) and brushed over such parts of the blue print which it is desirable to remove, will obtain that object. After washing, the rough violet edges are removed by the acetic acid. Similar results in a modified form were obtained by using "old developer" for writing on blue prints. The letters do not become of a clear white, but retain some blue colour—not enough, however, to be detrimental.

#### *Supplement by F. C. Beach.*

To reduce a blue print it is only necessary to use some alkali, such as carbonate of soda. In the cases just mentioned, it is the carbonate of potash in the developer which is the active reducing agent. A solution which will gradually reduce a blue print is composed as follows:—

Carbonate of soda	...	...	...	8 grains
Water	...	...	...	1 ounce

It may then be treated with acetic acid as described, which in a measure restores the brilliancy of the print, and neutralizes the effect of the alkali. I have a specimen print reduced in this way which I will pass around.

### PHOSPHORESCENT PHOTOGRAPHS.

BY P. C. LUCHOCHOIS.

THERE is no substance which escapes the action of the physical forces, this action causing a disturbance in the particles of the substance, which being set in a more active vibratory motion, are dissociated, or transmit perceptibly or imperceptibly to our means of observation the mode of action imparted to them, either in the form it has acted, or in some other transformations of the initial force, motion.

Amongst the phenomena which result thereof, the most interesting, perhaps, is phosphorescence. In this case no chemical change occurs, but the substance absorbs the energy of the caloric and luminous vibrations, which it radiates afterwards as heat and light in an attenuated form, but sometimes still capable of impressing the silver salts. Hence, if a layer of such a substance be exposed under a transparency to the action of the sun's light, or to that emitted by magnesium in incandescence, it will radiate light from the parts acted on to the exclusion of the others, and consequently a phosphorescent photographic image will be produced, which, of course, can be seen only in the dark. Many substances possess this property. Amongst them we will cite the sulphides of strontium, calcium, and barium (in which latter the phenomenon was for the first time observed in 1604), calcium chloride, calcium phosphate, fluor spar, indurated limestone, rock crystals, yellow amber, diamond (which possesses also the curious property to become of a fine yellow tint when heated, and to so remain for many days without having suffered any alteration whatever). All these substances should be well desiccated or calcined, when they can stand a high temperature, and kept in darkness for a certain period before experimenting with them.

The phosphorescent light, its intensity and duration, is not the same with every substance, and even varies according to the mode of preparation of the substance itself and the manner it is impressed. Thus: calcium sulphide prepared by the action of potassium persulphide on marble, calc spar, chalk, or lime



emits after insolation, either an orange yellow, green yellow, or violet light, and what is most remarkable, whatever be the refrangibility of the rays which have impressed the substance, the rays emitted are always of a less refrangibility. For example: the violet rays may give rise to an indigo light, the blue rays to a green one, and the indigo to a blue or green light; the ultra-violet rays, which are invisible, may be transformed into a blue light; but if the substance be impressed by the red rays at the end of the spectrum, only the calorific rays, which are invisible, are given off.

The temperature of the substance has also a great influence on the phosphorescent phenomenon; thus strontium sulphide heated to 68° F. emits a blue light, at 104° the light is blue, and becomes yellow at 212°.

Generally at common temperatures the light is green or blue, with strontium sulphide—bright green, yellow, or orange with barium sulphide—red at first, then white with rock-crystals—green with calcined fluor spar (chlorophane), &c.

The most phosphorescent substances are the sulphides of barium, calcium, and strontium. The duration of the light has been observed for a period of thirty hours in the two latter compounds. Chlorophane also remains phosphorescent for some hours.

The sulphide of barium is usually termed the phosphorus of Bologna—that of calcium, phosphorus of Canton. The phosphorus of Homberg is the chloride of calcium; the nitrate of the same metal constitutes the phosphorus of Baldwin.

These two latter salts, being very deliquescent, are not well adapted to obtain phosphorescent photographs. The phosphorus of Canton, which is one of the constituents of the luminous paint, being little soluble, should be selected for experimenting. It is prepared by calcining in a well-covered crucible two parts of calcium carbonate (chalk), or three parts of powdered oyster shells, intimately mixed with one part of the flowers of sulphur until the excess of the latter be eliminated, which requires from thirty to forty-five minutes. The other sulphides are prepared in the same manner, using the carbonate of the metals mixed with half its weight of sulphur. When the chemical action is over, the crucible is allowed to cool down, and the sulphide finely pulverised whilst still warm, and preserved in well-stoppered vials in the dark.

To prepare the phosphorescent film, a thick coating of the substance is applied on a sheet of paper with gum-arabic. Other means can be devised by the photographer; thus a sheet of albumen paper may be placed between damp blotting-papers, and when the albumen is softened and gluey the substance is dusted over, and to secure adherence, gently pressed into contact with a pad of cotton, when the excess is removed with a camel hair brush. This method is not, however, recommended, for only a thin film of the substance is obtained, and, consequently, the phosphorescent light is feeble and of little duration. Whatever be the method employed, the paper should be well dried before a fire, and kept in a dry place sheltered from the influence of dampness, air, and light for a certain period before use; the reason is obvious. It is then placed on a transparency and exposed for an instant to sunshine, or to the magnesium flash light, when in the dark a luminous image of the most singular effect will appear, and if different sulphides were side by side applied on the paper, various coloured lights would be emitted, and the phenomenon more astonishing.

Another method to obtain phosphorescent photographs consists in preparing a plate glass as for the dusting process, and, after exposure under a slide, to apply the substance, which then adheres only on the parts which remain hygroscopic.

The persistence of the phosphorescent light varies according to certain causes, which have been explained; but when the energy is exhausted the substance can again be impressed and produce the same effects. However, the sulphides being transformed into sulphates by the atmospheric oxygen, and, therefore, slowly losing the property of becoming phosphorescent, the film should be protected by some substance which isolates it from immediate contact with the air. A coating of plain collodion, prepared with castor oil or paraffin, is the best medium at the disposition of photographers to prevent for a long time their alteration, provided other precautions which suggest themselves are taken.

Although this curious process is not susceptible of useful applications, and should be considered as a photographic recreation, it is, nevertheless, suggestive to those who are interested in the action of light on matter, and especially on the silver compounds employed in photography.—*Anthony's Bulletin*.

## ON THE MAGNESIUM LIGHT IN PHOTOGRAPHY.\*

BY J. J. HIGGINS, A.M., M.D.  
NEW YORK, U.S.A.

THE transmission of magnesium through flame for ignition is by no means new, for what is there, indeed, as the adage goes, "new under the sun?" Its practical application, however, is dependent upon divers and suitable detail of construction of apparatus, upon many experiments and tedious tentative trials therefore, and such thought and invention as may be necessary for the production of the end in view. As an outcome of such factors, I exhibit to you a lamp not only achieving the desired result, but even still more. Of magnesium, *per se*, I have but little to say. All now are aware of its use as a photogenic agent; that it is the lightest of all metals, and although not a *propter hoc*, that it is, *par excellence*, the light-giving metal.

God, in his omniscience, has decreed to all nature periods of activity and rest—the day is succeeded by the night, the summer by the winter; the tides have their diurnal high and low water—but man, in the nineteenth century, with its wonders of progress and advance, seems determined to ignore even the semblance of repose, and would have the tides of business, science, and invention ever on the flow. And our art, swinging boldly from the shore into the very centre of the swiftly flowing stream, has shown by its advance that the disciples of Daguerre are not of those who are left behind. Until of late the camera had its periods of rest. Science had enabled man, gathering the light rays with photographic lens, to pencil with Nature's own pen her ever-varying scenes of loveliness and beauty upon leaves of precious metal.

But for these inimitable transcripts, light in both quantity and quality was needed. With the summer solstice passed and the autumnal days upon us, we soon found that Nature, chary of her charms, threw a screen o'er all, mantling with snow and icy sleet both field and forest, and with the inclemency of cold and storm, we were forced to give the camera its rest—a partial rest, 'tis true; for who is there among us, who then culling from his stored up treasures his finest, sharpest negatives, did not hang the positives resultant, crystal offerings, in their windows, to the light that limned them.

Soon, however, with the vernal sun smilingly inviting, it was again seen dotting everywhere the valley and the hillside. But now, with heaven and earth both conspiring, its rest has past; and ever, be it night or day, with the brightest noontide light, or the darkest midnight gloom, it is our slave, and *nolens volens*, ready for its work. The word "Photograph" will no longer stand solitary and alone upon the sign-boards, but be associated in loving union with "Magnesiumgraph," its new and virgin bride.

The usual, and one might say almost universal, mode of the use of magnesium, is that, in which combined with other agents, it is exploded in what is known as flash-powder, or tablets, or cartridges. Great care is necessary in their use, safety requiring an attached fuse for ignition by a torch of considerable length, and that the operator says at once "good-bye" to the prolongation of his near acquaintance.

In their use, again, it is impossible to give an exposure at the given or desired moment, by reason of the lapse of time unavoidably attendant upon bringing the torch to bear upon the fuse and lighting it, and the then subsequent explosion of the flash-powder. In portraiture, for instance, not only can a desired expression not be caught, but movement may have taken place.

With moving objects, whether animate or inanimate, the same objection is fatal to its use. This was well exemplified in an attempt to obtain some negatives of the chimpanzee in Central Park, "Mr. Crowley," recently deceased, *requiescant in pace*. With considerable expense and trouble some photographers brought there a couple of large-sized cameras; and with great (for their plates were large, and something unusually fine and grand was aimed at) focussed the same upon the gentleman from foreign climes. For certainty of results, they had provided themselves with some flash powder, and when ready the exposure was made. Mr. Crowley, however, was *non est*, that is, "he wasn't there."

Now the education of Mr. Crowley, under the tutorship of the exceedingly gentlemanly and courteous superintendent, Mr. Concklin, had been brought to a high state of perfection, and it

\* An address delivered before the Photographic Section of the American Institute, September 4th, 1888, and repeated, by request, before the New York Society of Amateur Photographers, September 21st, 1888.



was claimed that he understood the whole business, and remained quiet enough for the gentlemen to get their proper focus, &c., and then simply fooled them by stepping one side at the critical moment; in a word, that he knew more than the photographers. My opinion, however, is different, and I opine that he was a perfect ignoramus, but, that when he saw the match struck to light the fuse, and noticed the little fiery scintillations creeping up to the powder, he thought it was time to skip. The question is, of course, an open one—the explosion most certainly was, for Mr. Crowley was not in the field—and no amount of entreaty or cajolement could bring him out from his little corner in which he had ensconced himself. With the lamp that I show you, as you will see further on, there would have been success, and the legend on the prints could have been *veni, vidi, vici*. As to the danger attendant upon these flash-powders, it is well known it is not chimerical or imaginary, and any representations to the contrary are reprehensible. Serious accidents have occurred with them, even to the loss of life. They are not permitted through the mails. In the lamp here shown no compound of magnesium is employed—magnesium only, magnesium pure and undefiled—magnesium which is not only not explosive, but with difficulty inflammable in ordinary flame.

Another serious objection to these compounds is the fearful volume of smoke following their use, which, aside from its injurious and irritating action upon the eyes, and throat, and chest, renders succeeding exposures impossible. I think you will be surprised at how beautifully this nuisance is, for the most part, got rid of; the combustion of the magnesium being so perfect, that there is but very little smoke, and that of a thin and entirely different character from the heavy clouds settling down like a fog, and necessitating the instant opening of doors and windows, for, as you well know, its very slow removal. With the lamp before you, I have made as many as a dozen exposures of an evening; the smoke here never being a source of hindrance. I exhibit to you a couple of interiors so made, the one succeeding the other in my own house. The small amount of magnesium used for each negative will astonish you. An operator, highly skilled, and in constant practice with magnesium, was present, and I asked him what amount of compound he would use. His reply was 200 grains. I said I would only use 15 to 20 grains. The negatives were all that could be desired, as the prints show. No such negatives could be obtained by daylight. Examine closely, and you will agree with the many critics and judges who have seen them, that they are beyond all question of the very highest order. They are the same as were exhibited by Mr. Rockford, of New York, at the Minneapolis convention; as, indeed, are the lamps which I have here, I having loaned them to Mr. Norman White, of 96, Maiden-lane, New York (to whom I had given permission for the manufacture of some) for such purpose.

The plates that I find exceedingly well adapted to this use, as, in fact, to all uses, are the well-known Seed plate No. 26. Others will, of course, answer. Of these I speak from a very thorough experience. They yield a negative chock full of detail; the edges or borders are clean and transparent, never striking in and fogging a plate from previous action induced by the interposed separators; as development proceeds it becomes more and more like our *beau idéal*, and we offer thanks that the problem of plates is solved. *Experto crede*. The lens should be first class, giving definition to margin on full opening, and that a large one. They exist, but are not easily found. Mr. William T. Gregg, of 25, John Street, New York, has recently in the journals called attention to the fact that our lenses, as now made, are corrected for white light, and that a different correction is needed for the magnesium. I find that he is right, and am now engaged in co-operating with him in the necessary trials for the bringing out of a lens specially adapted to magnesium exposure. If successful, their selection would, of course, be advantageous.

As to reflectors, seldom needed, yet oftentimes useful. The best, a white sheet suspended behind a lamp; it is unequalled. Of the very many purposes for which the lamp is serviceable it is hardly necessary to speak: as the sole agent, or as an adjunct (the daylight being insufficient, and the lamp used as an aid), in gallery work; for interiors a necessity; the social circle; the dinner party; the waltz with its rapid movements, or the more quiet cotillon; the loved little ones, or, if they are wanting, the pet dog or cat, or the monkey and the parrot (of the latter a print); the dense shade of either nook or shrubbery, oftentimes so invitingly presenting itself; the camping party in the Adirondac or other

woods, with the trees shutting out the light; all, and many, many more cases, too numerous to mention, are at our command. We are, indeed, disciples of the Sun—it is our god we worship—but Magnesium is our queen.

And now in the way of demonstration. By most simple means, as you see, the mere compression of a bulb dilating an interposed or storage bulb, power is obtained to any desired extent for the ejection of the powdered metal through the flame. The receptacle is of greater capacity than ordinarily necessary. It may be more or less filled, *pro re nata*. Ten to twenty grains are introduced. The flame is large, some two inches in diameter, and say a foot or more in height. You will note that its character is at once changed by the superposition of a device termed an "erector," into one intensely blue, solid and columnar like. Through the centre, by a touch of the finger upon this attached key, at any desired instant, the charge is driven and the exposure made (exhibit); and, as you have noticed, without noise, detonation, or explosion, silently and in conformity with the saying "that still water runs deep," effectively. The clouds of smoke, for riddance from which you so regularly hasten to open the windows, you do not see; the combustion has been perfect, and no veil is settling down upon you, for it is comparatively and practically smokeless. Instantaneous, or more prolonged exposure, or repetitions thereof, are at one's pleasure; the same being effected by and dependent merely upon the handling of the bulbs (exhibits).

Again, by the interposition of a "T," or many-wayed piece, two or more lamps can be simultaneously discharged, giving an illumination beyond all precedent—an illumination which must be seen to be appreciated (exhibited).

For many purposes the one or terminal bulb is sufficient; its compression, however, ejects but a very small amount of magnesium, and that slowly. It is in the use of the two bulbs that the full power of the lamp is at one's disposal.

Aside from photographic use, its utility for signal purposes in the naval or merchant service is apparent. By means of this faucet interposed, liberating at will the power instantly or slowly, we have at once the Morse alphabet of dots and dashes. The marine in a moment is at the mast-head, with no impediments, and a light, not a point, as with the electric, but of large size and volume, is flashed out at command, the only addition necessary being that of suitable protection against wind and storm. If the code requires coloured as well as white light, the admixture of, e.g., strontium nitrate will give the red, and so on.

## THE IDEAL-COLOUR SENSITIVE PLATE.

BY FRED. E. IVES.

MANY writers on the subject of orthochromatic photography have assumed that a photographic plate which would give a correct colour-value photograph of the spectrum, would give the most correct results in photographing objects by reflected light. I long ago pointed out that this is a mistake, but I believe the fact has not yet been recognized by anybody else.

The demonstration is simple enough. A collodion emulsion chlorophyll plate which is three or four times more sensitive to the red and green of the prismatic spectrum than to the yellow, will invariably photograph bright yellow objects lighter than either red or green ones. In fact, I do not hesitate to assert that if we could sensitize the plates for two colours only, red and green, sensitiveness would be far more useful than either red and yellow or yellow and green sensitiveness.

The reason is not far to seek. All objects which appear bright yellow to the eye freely reflect both the red and the green rays of the spectrum, and may be correctly photographed on a suitable plate through a screen which cuts off every ray of true spectrum yellow. The green and red objects will photograph darker than the yellow, as they should, because the green object does not reflect the red light, and the red object does not reflect the green light.

This observation suggests also the reason why blue objects invariably photograph many times lighter than yellow ones on some plates that are more sensitive to spectrum yellow than to spectrum blue; the blue object reflects not only the blue rays, but, in many cases, nearly all the rays of the spectrum from dark green to extreme ultra-violet, and will still photograph lighter than yellow objects on a commercial orthochromatic plate when every ray of the true spectrum blue is cut off, provided that the violet and ultra-violet rays are not cut off at the



same time. Deep red objects, on the other hand, reflect chiefly the red rays, and can be successfully photographed only by the action of those rays.

It is therefore evident that the ideal colour-sensitive plate would be at least as sensitive to the red and green of the prismatic spectrum as to the yellow, and that the sensitiveness would fall off rapidly in the blue, and end in the extreme violet.

—From the *American Journal of Photography*.

## HOME PORTRAITURE.

BY ALBERT A. EDDY.

MANY times the question is asked the amateur if he can take portraits in the house. Perhaps it is asked by a friend who would like a photograph taken of his little child, whose dimpled cheeks and little smiles would be an ornament to any one's collection; or, perhaps, it is asked by some one of the older fair sex, who thinks a picture taken of her in her own parlour would be quite a novelty. To these questions the amateur replies that it is impossible for him to take any kind of a picture in the house, as he has no skylight. Now I will endeavour to give such instructions that, if followed, and with a very little practice, any one who is fairly successful with out-of-door work may obtain far better results in portraiture than can be obtained out of doors under the most favourable conditions that may be presented to him. After he has once gained the principles of in-door work he will find it very pleasant to take his camera to his place of business and photograph, we might say, his employer, or any of his friends that he may choose, for I have obtained some very pretty pictures in an office with nothing to work with outside of the camera but an office chair and a white Holland curtain, using the paper on the wall for a background.

The window to select is one that will give plenty of room for a background without casting any shadows upon it, and one that will give ample room for the camera as well. Do not try to take too large a bust picture, as in so doing you will obtain a distorted picture—that is, the picture will look too old for the person taken. Neither is it a good plan to take a full-length picture, as the result may not prove satisfactory, but a bust or three-quarter length is most preferable. Having selected the window, we will now place a chair so that, when the sitter is in it, his head will be about twenty-four inches from the end of the window. Now move the chair out from the side of the wall eighteen inches or more. The exact distance is immaterial, but the distances I have given are those I use; and obtain the light at an angle of about forty-five degrees. Should the sun shine in the window, tack a piece of cheese cloth across the upper half. This will diffuse the light so that the shadows will not be so heavy on the face, and heavy shadows are to be avoided if one wishes to get nice results. Should the sitter wear dark clothes, do not diffuse the light from the bottom half of the window, but give all the light you can, except the direct sunlight. Should the sun not shine directly into the window, the cheese cloth need not be used; but should the clothes be very light, tack a sheet across the bottom half of the window (a single thickness is enough). Should you possess an old wooden chair, use that, and saw off both sides of the back, leaving the centre of the back to rest against; you will then obviate the back of the chair showing across the shoulders in the finished picture. It looks out of place in a picture which is intended for the album to see the back of a chair projecting past the body. I also find a headrest a very convenient article to use, but in using it care must be taken not to raise the chin too high.

The background should be of plain colour. An opaque curtain of drab or light slate colour makes a good background; or, better still, a piece of felt, which can be purchased about two yards square, answers better, as it gives a softer effect in the finished print. For a reflecting screen a Holland shade is better than a piece of plain white cloth, as the gloss on it makes a better reflection. Having placed the chair as before described, with the subject in it, let the body be facing square to the camera, turn the head to one side, say towards the window, but not so much that the light will be full in the eye, but just enough to secure good catch-lights in the eyes. Place the background back so far that a shadow of the sitter may not be on it. The reflecting shade should be placed about three feet from the dark side of the face, so as to soften that side of the face a little. Do not place it too near, for in so doing you will obtain

a harsh effect. Should you prefer to turn the head from the window, be sure that the reflector does not cast any reflection in the eyes.

The camera should be placed on a line with the window. Raise it so that the top of the head will come nearly to the bottom of the ground glass, then tip it forward so that the chin may come just above a line drawn horizontally across the ground glass. Now focus on the eyes, or, better still, upon the eyelashes. This should be done with the open lens or the largest stop. The plate should be given from two to three times as long an exposure as you would for a portrait out of doors. A long exposure and slow development give better results than *vice versa*. I have an inside shutter, which I find is a most excellent thing in taking inside portraits, as you get rid of using the cap and of attracting the attention of the sitter, especially when taking children.

A very neat way of taking a lady's picture is to have her in a standing position, with a headrest placed at the head, and a black felt background placed some distance back, then throwing a white lace shawl around the shoulders, and bringing one corner up over the back part of the head to the front so as to show a little on the top of the forehead. Then take a piece of cardboard about twelve inches long by seven or eight inches wide, cut it down the long way in an oval form to about half the depth of the card at the centre, then cut this edge like saw teeth; place it directly in front of the lens, say three inches from it, and not quite midway up; you will then form a vignette. In finishing a print so made, vignette it with a circular vignetter in the printing frame. Trim the print perfectly round, and mount in a round gilt edge mount, and you will then have a picture suitable for an easel, to be placed on any table or shelf in any one's parlour. Try one and see for yourself.

In taking a child's portrait, say of a year old or older, just throw a figured shawl over the easy chair, place the little one in the chair, arrange the camera as before described, use the shutter carefully, so as not to attract his attention, and see if you don't get results that will be surprising to you.

I think now I have given such instructions as will enable any one to get good results.—From the *Science of Photography* (Philadelphia).

## PHOTOMETRIC OBSERVATIONS OF ASTEROIDS.

It has frequently been suggested that the asteroids, shining by reflected light, and subject, it might be assumed, only to variations the amount of which could be calculated for any required date, would prove specially useful as standards of brightness in the photometric observation of the fainter stars. Mr. Henry M. Parkhurst has carried out recently a series of observations on several of these bodies, which throws considerable light on their suitability for such a purpose. His method of observation was to note the time which the asteroid took to disappear after passing a transit-wire, the telescope being stationary, and the light of the asteroid or comparison-star suffering diminution either by a wedge or more frequently by a deflector—a piece of glass with nearly parallel sides, placed in the telescope tube, about one-seventh of the way from the focus, and covering half the field. The results of Mr. Parkhurst's observations, which embraced eighteen asteroids, and extended over nearly nine months, April to December 1887, are given in No. 3 of Vol. 18 of the *Annals of the Harvard College Observatory*, and show that the asteroids are not appreciably self-luminous, and that the sun undergoes no noteworthy fluctuations in light in periods of a few days; nor, as a comparison with observations made in some former years would indicate, in more lengthened periods. But they also show that the phase-correction is not covered by allowing simply for the decrease in the area illuminated—a further correction is needed, and one peculiar to each asteroid. In two cases, also, Harmonia and Iris, several of the observations stand out in strong contrast to the rest, and appear to indicate a variation due to axial rotation, the planet probably being irregular in shape, or its surface in reflecting power. No variation depending, as in the case of Saturn's ring, on the position of the asteroid in its orbit, and the relative position of the earth, has been noticed, but this inquiry has only been extended to the four asteroids first discovered. The mean error of an observation, when the special phase-correction and probable variations due to rotation have been allowed for, appears to be less for an asteroid than for the fixed stars, the mean error of an observation of the solar illumination in the inquiry referred to above being given as 0.116 m.—*Nature*.



## Patent Intelligence.

### Applications for Letters Patent.

- 13,996. HENRY WILSON, 24, Heathfield Road, Mill Hill Park, Acton, W., for "Improvements in Portable Photographic Cameras, and Appliances relating thereto."—29th September, 1888.
- 14,089. JOHN TAYLOR LEIGHTON, Gray's Inn Chambers, 20, High Holborn, London, W.C., for "Improvements in Apparatus for the Exhibition of Photographic Pictures, Advertisements, and the like."—1st October, 1888.
- 14,218. JAMES BOOKER BLAKEMORE WELLINGTON, 38, Fellows Road, South Hampstead, Middlesex, for "Improvements in Cameras of the Box or Detective Class."—3rd October, 1888.

### Specifications Published during the Week.

- 11,985. AUGUSTUS GEORGE VERNON HARCOURT, Cowly Grange, Oxford, in the County of Oxford, Gentleman, for "An Improved Standaard Oil Lamp for Use in Photometry."—Dated 3rd September, 1887.

[Specification, with illustrations, in our next.]

## Correspondence.

### THE PHOTOGRAPHIC EXHIBITION.

DEAR SIR,—In your issue of October 5th you reproduce a long article from the *Times* relative to the exhibition of photographs now on view at the rooms of the Royal Society of Painters in Water Colours, in which mention is made of some photographs of Palmyra recently taken by Mr. Horace W. Gridley, as the *only* photographs in existence of those wonderful ruins.

In justice to me, I am sure you will correct this misstatement in your next, a series of about thirty views having been taken by me thirteen years ago under all the difficulties of wet plates. These, though pronounced a *failure* by the *Times* reviewer, are not so considered by competent critics.

I can well believe that Mr. Gridley may have been more successful than I was, as his time at Palmyra seems to have been unlimited, whereas I had but two days there, the greater part of one being spent under canvas, as we had a tropical storm which lasted some hours.

I must also mention that previous to my visit, Palmyra had been photographed by a French artist, by name, I think, Rombeau, whose views are, I believe, still sold in Syria.

I enclose a catalogue, and my views can be seen at Messrs. Mansell and Co.'s, Oxford Street, and at Mr. Spooner's, Strand.—Yours truly, V. MASON GOOD.

### BIDDLE V. FRY AND CO. (LIMITED).

DEAR SIR,—I shall be glad, with your kind permission, to make a few comments upon your notes in this case, and to draw your attention to some of the evidence which appears to have escaped your reporter's attention, or to have been deemed of minor importance, but which materially affects the issue.

As the case is still *sub judice*, it will be in accordance with usage to defer further observations until judgment has been given.—Faithfully yours, S. HERBERT FRY,

Manager to S. Fry and Co. (Ltd.)

[Our correspondent does not enclose any further evidence, or additional particulars. See also pages 642 and 648.—Ed. P.N.]

### ORTHOCHROMATIC PHOTOGRAPHY.

DEAR SIR,—Some little time ago I wrote to you with respect to some experiments I had made with ortho- or isochromatic plates. I did not then mention the name of the maker of the plates I used, but in justice to Messrs. B. J. Edwards and Co., I feel I ought also to send you the result of further experiments with their plates. After the publication of my letter, Messrs. B. J. Edwards and Co. kindly sent me a sample of plates with which I made the

second series of experiments. They also sent me one of their isochromatic models, which consists of an exceedingly dark blue design on a bright yellow ground. I found that with this model, their plates unquestionably give a more correct idea of the visual difference between the two colours than any ordinary plate will give. Further experiments with flowers also confirm the sensitiveness of these plates to yellow rays, but I have so far found no blue, excepting the one on their model, to which their plates are less sensitive than ordinary ones. I enclose two photographs of flowers, and which also include the isochromatic model, one from an isochromatic and the other from an ordinary plate. You will see the superiority of the sunflower and the group of yellow *calceolarias* on the right in the case of the isochromatic plate, but the dark blue monkshood is no more truly rendered than in the case of the ordinary plates. The plates with which I made the first series of experiments were bought in Liverpool, and were very inferior, from an isochromatic point of view, to those which Messrs. Edwards and Co. sent me. This inferiority is admitted by that firm, though they are unable now to trace the cause. Had I used in the first instance the plates they sent me, I should doubtless have discovered their sensitiveness to yellow rays. In conclusion, I can only say that Messrs. Edwards and Co. do make plates which are sensitive to yellow rays, and less sensitive to certain blue rays than the ordinary plate, and that their plates are otherwise in all respects up to their usual standard of excellence.—Yours truly,

Appleton, *Widnes*, October 6.

VERO C. DRIFFIELD.

## Proceedings of Societies.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE usual weekly technical meeting gave place on the 4th inst. to an exhibition of photographs of places visited during the meeting of the Photographic Convention of the United Kingdom recently held at Birmingham. Considering the very unpropitious weather that was experienced during the whole time of the Convention, the collection of exhibits must be regarded as exceedingly good. Prints were contributed by W. Rooke, W. Cobb, R. Keene, H. M. Smith, J. Traill Taylor, C. Wollaston, J. P. C. Combrano, J. Forest, J. B. Wellington, and C. Phipps Lucas.

An attractive feature of the evening was the optical lantern under the direction of F. A. Bridge. A large number of slides were projected on the screen, many being of exceptional merit. Considerable amusement was caused by a series of slides showing the social side of the Convention, conveying some idea of the thoroughly enjoyable nature of the Convention meeting throughout. Transparencies from the following members were shown:—F. A. Bridge, A. Pringle, J. J. Briginshaw, W. Cobb, J. B. B. Wellington, F. York, T. Charters White, W. Jerome Harrison, J. Pickard, E. H. Jacques, S. J. Holliday, W. Rooke, J. H. Manley, W. Tylar, C. G. Husband, A. Pumphrey, A. J. Leeson, G. Smith, S. Delicate, J. Collier, Harold Baker, and C. J. Fowler.

A hearty vote of thanks, proposed by J. J. BRIGINSHAW, to the exhibiting members, and also to F. A. Bridge for his able manipulation of the lantern, was cordially endorsed. The proceedings then closed.

### NORTH LONDON PHOTOGRAPHIC SOCIETY.

At the ordinary meeting on October 2nd, J. TRAILL TAYLOR in the chair, Thomas Illingworth was elected a member of the Society.

The PRESIDENT introduced to the Society the actual producer of the colossal pictures recently exhibited by the Eastman Company in this country—

T. BELLSMITH, who was warmly received by the members, and said that it gave him great pleasure to find himself among English photographers, whose works, he might remark, were now held in the highest estimation by their American brethren. Formerly they had taken the splendid productions of Germany as their ideal, but were now compelled to acknowledge the superiority, both in technique and artistic feeling, of such English masters as Robinson, Sutcliffe, or Gale. He had had



much experience in bromide enlarging, and should be glad to give any information in his power respecting the process.

H. M. SMITH then read a short but practical paper on "Enlarging," in which he passed in review the various methods now in vogue. Dismissing the daylight method, as being in this country uncertain in the matter of exposure, and, moreover, necessitating the attention of the photographer at a time when he had plenty to do in the studio, some kind of artificial light was necessary. Where the electric light could be readily obtained, nothing better could be desired, although in the majority of cases the oxyhydrogen light of the ordinary blow-through type would be found most convenient. Oxygen gas could now be purchased at a cheap rate, and would keep in the iron or steel cylinders almost indefinitely. The apparatus before them was constructed by an ordinary carpenter under his own direction, and comprised nothing not ordinarily in the possession of the professional photographer except the condenser, ten inches in diameter, which had, of course, to be purchased; the ordinary portrait and rectilinear lenses were used as objectives, while the limelight jet and tin dome and chimney were temporarily borrowed from an ordinary optical lantern. The room being now darkened, Mr. Smith made an excellent enlargement on paper, 24 by 18, from a cabinet negative; after the operation was complete, the negative was passed round.

Mr. BELLSMITH said that he must congratulate Mr. Smith on the successful enlargement he had made. When he saw the negative to be used he feared that a good enlargement could not be made from it; it was, he considered, too hard and dense for that purpose, although of good quality for the production of ordinary silver prints. Bromide paper used for enlarging had a tendency to exaggerate the contrasts of a picture, and where a dense negative was used it was difficult to secure detail in the high-lights without obtaining poorness and greyness in the shadows. He would like to know if Mr. Smith had tried the effect of interposing a sheet of ground-glass between the condenser and negative.

Mr. SMITH replied that he had not done so.

Mr. BELLSMITH had found it to secure great evenness of illumination. This was particularly necessary when the enlargement was not to be vignettied.

T. E. FRESHWATER showed a silver print and bromide enlargement from the same negative, showing a great loss of detail in the shadows of the latter.

F. W. HART recommended the use of distilled water throughout the manipulations of enlarging, as the lime precipitated from hard water degraded the shadows to a perceptible degree; distilled water also prevented the precipitation of iron, and thus insured pure whites.

F. W. COX had never used distilled water, and had not found any degradation of colour to result.

Mr. BELLSMITH said that in dealing with a dense negative a more harmonious enlargement could be secured by reducing the proportion of iron in the developer; the exposed paper could also be first soaked in the oxalate of potash solution, which would tend to a softer picture; while a preliminary soaking in the clearing solution would prevent the precipitation of iron on the lights of the picture.

The PRESIDENT did not agree with Mr. Smith as to the inadvisability of using daylight for enlarging; where the operator had time during the day to make his enlargements he thought it the best source of light.

Mr. SMITH said that even then he thought so much more paper would be spoiled by the variation in the light, that in the end daylight would be found to cost more than the practically constant oxyhydrogen light.

E. A. RICE had obtained different results from different makes of paper. He found the Britannia gave soft images and was suitable for rather hard negatives, while the Eastman paper was slower and gave the best results from a thin negative.

Mr. BELLSMITH said that he was surprised to find that the Eastman paper was considered slow. He presumed that the last speaker referred to what was known as the daylight paper. The Eastman Company made two kinds of bromide paper, one for daylight enlarging or printing, and the other, which was four times as quick, for artificial light; he was a little surprised to find that in England the slow paper was almost exclusively used.

W. BISHOP said that whatever illuminant was used it was a very useful precaution to make a preliminary exposure on a small piece of paper, three or four inches square; if this was correct a large sheet could be exposed with confidence.

J. HUMPHRIES asked how the operator was to judge the exposure when using the electric light, considering the sudden and unexpected fluctuations to which it was subject.

Mr. BELLSMITH said the exposure could only be judged by intuition. He often changed his mind as to the length of exposure after removing the cap.

The PRESIDENT announced that at the meeting on October 16th "Home Portraiture" will form the subject of discussion.

#### SHEFFIELD CAMERA CLUB.

AN ordinary meeting was held October 5th, at 8, Fitzalan Square, Dr. MORTON presiding.

After the formal business, the following were elected members:—Albert Manton, Noel Burbidge, and Harold Nowell.

The subjects for the evening were "Special Methods of Development," by J. Rawson, and "Printing on Bromide Paper," by G. L. Maleham.

Mr. RAWSON demonstrated his method of negative making, having brought a number of variously exposed plates. He used a formula consisting of a stock solution containing in proportion to the ounce of water, and marked No. 1—

Pyrogallol	...	...	...	...	80 grains
Am. bromide	...	...	...	...	10 "
Citric acid	...	...	...	...	4 "
Water...	...	...	...	...	1 oz.

#### Solution 2.

Liq. ammonia	...	...	...	...	80 m.
Water	...	...	...	...	1 oz.

A dram of No. 1 mixed with two ounces of water, and a dram of No. 2 diluted with a similar amount of water, formed a normal developer; but in dealing with plates of unknown exposure he began with very little ammonia, and he had always ready a bromide solution to check development if necessary, also a jar with a separate solution of ammonia having in it a camel hair brush, which he occasionally applied to parts of the negatives under-exposed. On completing the process and fixing, all the plates proved highly satisfactory, and appeared of equal density.

G. E. MALEHAM showed how to print with bromide paper by gaslight, using Eastman's paper and ferrous oxalate formula; the resulting print was successful.

A discussion followed, in which the President and Messrs. Gilley, Stubbs, Newsom, and others joined.

#### COVENTRY AND MIDLAND PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society was held at the Dispensary, on October 3rd. The chair was taken by the President, Councillor ANDREWS, and there was a large attendance of members.

George Moore was elected a member of the Society.

The annual meeting was fixed to take place on November 7th, at 8 p.m., and officers were nominated to serve for the ensuing year.

The remainder of the evening was devoted to the ballot for positions at the exhibition, and the settlement of the final arrangements for same.

### Talk in the Studio.

THE GRAPHOPHONE.—At the British Association, H. Edmonds gave an interesting account of the development of the graphophone, but he did not touch upon the photographic possibilities of the case, by allowing a vibrating membrane to control an opening which can be focussed on a travelling sensitive plate, the resulting negative being used to produce a relief by some such method as the Woodbury process. As regards the history of the mechanical graphophone he points out how in 1681 Dr. Hooke exhibited some experiments before the Royal Society, showing how musical notes and other sounds could be produced by means of tooth wheels rapidly rotated. In 1854, Charles Bourseuil proposed to use two diaphragms, connected by an electric wire, and, by speaking into one of them, reproduce the spoken sounds at any distance in the other. This idea was actually carried out by Philipp Reis five years later. The phonograph was patented by Leon Scott in 1857; and Faber constructed a complicated speaking machine, which pronounced a few words and sentences most unsatisfactorily. But in 1876 appeared the Bell telephone, the first really perfect instrument for the transmission of speech. In April, 1887, M. Charles Cros deposited a paper at the Academy of Sciences in Paris on "A Process of Recording and Reproducing Audible Phenomena," in which he proposed to obtain tracings of sound-



waves by means of a vibrating membrane. Then, by going over these tracings with a stylus attached to another membrane, the sounds would be reproduced. Consequently, to M. Cros belongs the credit of having suggested a means of mechanically recording and reproducing spoken sounds. Later in the year, Mr. Thomas Alva Edison constructed a phonograph. In 1881, Professor Graham Bell, inventor of the telephone, with Dr. Chichester A. Bell and Mr. Charles Sumner Tainter, formed the Volta Laboratory Association in Washington, for the purpose of investigating the art of transmitting, recording, and reproducing sound. They conducted many elaborate experiments, and, among other things, sought for and discovered the cause of the failure of the Edison phonograph. They found that tinfoil, as used in that instrument, was far too pliable for the purpose, as it always had a tendency to pucker and destroy the symmetry of the sound-waves. They perceived that no good result could be obtained by merely indenting a pliable material; it was necessary to engrave a record in a solid resisting body; and this discovery enabled them to produce a really practical instrument, which they termed the "Graphophone." Instead of tinfoil, Mr. Tainter employed wax, ploughing out, by means of a vibratory stylus, a narrow undulating groove, which constituted a sound record. When this groove was retraced by another stylus and diaphragm, the original sounds were reproduced with a fidelity undreamed of by those only acquainted with the phonograph. In 1885, the Volta Laboratory Association was dissolved after performing most important work, and taking out a series of valuable patents. Mr. Tainter has brought the experience of years to the perfection of the graphophone. The kernel of the invention is the "recording cylinder," 6 inches long by  $1\frac{1}{4}$  inches broad, formed of cardboard coated with wax. This is placed in a small lathe and rotated by a treadle in contact with the "recorder," which consists of a metal frame supporting a thin mica diaphragm, in the centre of which is a steel point that cuts a narrow groove on the surface of the cylinder, according to the quality and intensity of the sound spoken against it. The recorder is then removed, and replaced by the "reproducer," a light feather of steel that travels along the grooves made on the cylinder, and transmits their undulations to a small mica diaphragm, which, in its turn, communicates its vibrations, as sound-waves, to the ears of the auditor by means of two india-rubber tubes, for Mr. Tainter thought it best to reduce the size of the record, and concentrate the sound in this way, on account of the greater distinctness that was thus secured. The manipulation of the graphophone is simplicity itself. It requires no adjustment, no electric motor, no galvanic battery. The foot supplies the motive power, and the machine regulates its own speed by means of an ingenious but simple governor. Journalists and reporters may dictate their articles and reports, leaving others to transcribe them. The principal of a firm can speak his day's correspondence into the machine, which will repeat it sentence by sentence to be written down in proper form by pen or typewriter. Or purely verbal communication can be carried on through the post by means of the record cylinders, which are extremely light, although capacious enough to hold 1,000 words a-piece.—*Journal of the Society of Arts.*

**LUMINESCENCE OF PYROGALLOL.** By P. LENARD and M. WOLF (*Ann. Phys. Chem.* [2], 34, 918–925).—The authors, without knowing of the similar observations previously made by Eder (*Photogr. Mitt.*, No. 344), observed that when a photographic plate after development with an Eder potash developing solution, or with a soda developer after previous washing with a solution of alum, becomes distinctly luminous, and remains so for a couple of minutes or so. The phenomenon appeared to them to be of sufficient interest to call for further investigation, and a number of experiments made with a view of determining the origin of the luminosity are described in the paper. As the phenomenon was found not to be a case of true phosphorescence, they call it "luminescence." From their investigation, they arrived at the conclusion that the phenomenon is due to both pyrogallol and oxygen being condensed on the surface of the freshly precipitated alumina, resulting in rapid oxidation. In general the luminosity was not observed when sodium sulphide was not present, but they found that a feeble luminescence could even then be produced by saturating potassium pyrogallate with pure oxygen, and then adding a solution of alum. From this and other experiments they conclude that the part played by the sodium sulphide is to delay the oxidation until the pyrogallol and oxygen have been brought into close contact in the pores of the precipitated alumina.—*Journal Chem. Society.*

**PHOTOCHROMATIC PROPERTIES OF SILVER CHLORIDE.** By G. STAATS (*Ber.*, 21, 2199–2200).—The author endeavoured to isolate the coloured substances formed on silver plates when the latter are treated with ferric chloride covered with variously coloured glasses, and exposed to sunlight (compare Abstr., 1887, 1671). Carey Lea's method (this vol., p. 1) was employed, but photo-red was obtained in all cases. Photo-red is produced when a silver plate of any colour is warmed. As soon as the superficial layer of the colour is treated with solvents, the colour is destroyed, but when very thin plates of chemically pure silver are treated with a solution of ferric chloride on one side only, then exposed in the usual manner until the red and violet colours appear, and finally dissolved in nitric acid, both the red and violet separate unchanged in thin plates, which are generally bounded by straight lines. The separated silver chloride, which has not been coloured, is built up of small yellow plates.—*Journal of the Chemical Society.*

**COVENTRY AND MIDLAND PHOTOGRAPHIC SOCIETY EXHIBITION.**—This Exhibition was opened on Wednesday last by the Mayor of Coventry, a large number of influential persons being present. It is held in the old Grammar School, one of the ancient buildings of the city, which has been specially prepared for its reception, and the pictures are almost entirely the work of the members, the object being more to show what the members of the Society are capable of, than to make a large display of prize pictures. Although no medals are offered for competition, which doubtless has had the effect of keeping away well known medal hunters, the Exhibition is a success, and the room has been well filled without. Should the Society another year venture upon an exhibition, we have no doubt it will be even more largely patronised, and show even better work. The Exhibition is open until Saturday, and each evening a lantern display is given, chiefly from the members' slides, by W. D. Welford, of Birmingham.

**STOLEN LENSES; A CAUTION TO PURCHASERS.**—On the 9th inst., the premises of Horace G. Lewis and Co., of Ranelagh Street, Liverpool, were broken into, and among the articles stolen were a number of lenses bearing the name of the firm.

**PHOTOGRAPHIC CLUB.**—The subject for discussion on October 17th will be "Cameras;" paper by Mr. Clifton.

## To Correspondents.

**A. DYSON.**—If you want to produce permanent enlargements by ordinary daylight, we think that your only course will be to make enlarged negatives, and to print from these by the carbon process or by the platinotype method. This is not a cheap course, as it involves first making a transparency, which is set in the wall of the enlarging room, and from which transparency the enlarged negative is made. For making the negative you have your choice of the wet collodion process, and the gelatino-bromide process (on glass or on paper.)

**CHARLES BAGSTER.**—The paper has become useless by age. You must sensitize as wanted for use.

**F. W. VEREL & Co.**—We cannot undertake the testing of the samples.

**H. H. SELWYN.**—It has been repeatedly described in the *NEWS* and *YEAR-BOOKS*. The powdered pigment is mixed with powdered gum, and brushed on the damp fabric.

**HARVEY EDWARDS.**—We should suggest soaking in water till rather soft, and then squeegeeing down upon a sheet of glass which has been waxed in the usual manner. When dry, strip off. Naturally you will make a trial with the least valuable one.

**W. RODMAN & Co.**—We are under the impression that it is supplied by J. R. Gotz, of 19, Buckingham Street, Adelphi.

**GEO. FOXALL.**—Your paper is to hand, and we are much obliged.

**F. B. G.**—The marbled appearance arises from imperfect washing after the hyposulphite or after the ferricyanide.

**NEMO.**—The precipitate consists principally of hydrated oxide of silver, and there is no objection to all owing it to remain in contact with the bath, provided you only use the clear portion poured off from the deposit.

**J. GUARDIA.**—Thank you for the article.

**ALEX. MORRISON.**—Nelson's "sheet" gelatino will answer the purpose.

**M. BOWMANS.**—We shall be very glad to have the communication referred to.

**M. CAPELLI.**—1. It is probable that the markings result from the use of glass having on its surface minute depressions which have retained some mischievous material. 2. The vapours of fresh pine wood, and also of some other kinds of wood, are well known to have this sort of effect on sensitive plates. Avoid leaving them long in the boxes.



# THE PHOTOGRAPHIC NEWS.

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## COLLODION COMPETING WITH GELATINE IN RAPIDITY.

For some time after the gelatino-bromide process had, in consequence of its high sensitiveness, ousted the collodion process from its long held supremacy of position in the studio and the field, the hope—or, perhaps, rather the desire than anything definite enough to be called a hope—would be expressed that further experiments with collodion would result in bestowing upon it a sensitiveness equal to that of its successful rival; and a decided preference was, on all other grounds than that of rapidity, very generally given to the older process.

Within the last few months it has been announced from two distinct sources that collodion emulsion is now prepared of a sensitiveness equal to that of gelatine. Dr. Hill Norris's process, spoken of at the Photographic Convention which recently assembled at Birmingham, promises us the long looked-for desideratum, and we hear from Germany that Dr. Albert, of Munich, has actually placed upon the market a collodion possessing not only the quality of high sensitiveness, but, at the same time, of remarkable orthochromatic characteristics. It indeed appears from Dr. Vogel's experiments with this emulsion, related in the *Photographische Mittheilungen*, that the collodion in question is not remarkably sensitive in its original condition, but becomes so when the orthochromatising solution is added to it. Compared with Perutz's orthochromatic plates—which are now pretty generally known, and can easily be referred to for comparison, being commercially obtainable in this country as elsewhere—Dr. Vogel found Albert's emulsion in the undyed state to have only one-tenth of the rapidity of the gelatine plates, but upon the addition of the orthochromatising solution the sensitiveness was so enormously increased, that in photographing portraits and landscapes it showed itself so rapid as to require no longer exposure than was required for the gelatine plates.

Albert's collodion emulsion, as Vogel tells us, is, when not dyed, pure white, and completely resembles the old collodion emulsion, both in appearance and range of spectrum sensitiveness. The change in both these points produced by the addition of the orthochromatising solution is astonishing. This solution is expressly stated to contain picric acid dye, although, as Albert calls it eosin silver, that is not the only colouring matter used. It smells, says Vogel, of ammonia, and he further tells us that by a mixture of erythrosin and picric acid he obtained a solution giving exactly the same absorption spectrum as Albert's solution. It appears, however, that there are two orthochromatising solutions supplied by Albert, one for portraiture and landscape work, and one, more sensitive to red, for the reproduction of paintings; and it was with the former solution that Vogel's experiments were made.

The advantages offered by the wet collodion process, which had to be relinquished when adopting the newer method with gelatine emulsion plates, were certainly, some of them, weighty. Some of the advantages, however, would not belong to a collodion emulsion process. In the first place, the consideration of economy was one which weighed with professional photographers accustomed to a certain outlay for the purposes of the dark room. The difference between the cost of a gelatine plate and a plain glass plate, together with collodion and other chemicals, might not be great, but then if the sitter moved, or from any cause the plate was wasted, there was, with collodion, the advantage that the glass itself could be used again, and the cost of the collodion and the proportionate quantity of silver absorbed from the bath was but small.

Other considerations besides that of economy will step in when a collodion emulsion process is in question, and some of these considerations will not be altogether to the disadvantage of gelatine. With a wet collodion bath process the work of preparing and coating the plate could be done in a good light. The collodion poured back from the plate into the stock bottle is in no way affected by the light, and with the exception of any dust that it may pick up, and of being a little thickened—evils which in systematic working it is easy to remove—the collodion poured back is quite available for further service. With sensitive collodion emulsions the conditions are altered. Not only must the plate be coated in the dim light of the dark room, but as this light, of whatever colour, will in time affect the sensitive silver compound, the collodion poured back will always take a trace of exposed compound with it, so that towards the end of a bottle, unless extreme precautions have been taken, some little fogging is likely to occur. Gelatine emulsion has, of course, also to be coated, but this task is not commonly undertaken by the photographer himself, but is conducted in special factories and almost in the dark. With the particular process of Albert's we learn, moreover, that there are other conditions which it is necessary to observe. The emulsion once dyed with the orthochromatising solution, will not keep more than two days, and the plates must be prepared and used wet as required, since, when dry, their sensitiveness is enormously diminished. The advantages and disadvantages of collodion emulsion must be taken together, and the balance struck. Which way the beam will incline, it is premature as yet to say.

There has been yet another process with collodion which we have heard, on the high authority of W. Ackland, has yielded results of a rapidity equalling that of gelatine emulsion. This gentleman has said that, by some means which he could never quite fathom, certain batches of collodion albumen plates were gifted with the high degree of rapidity to which we have referred, as belonging to gelatine. The quality of image given by the collodio-albumen



process is recognised as being exceedingly high, and it is to be hoped that the field will be re-worked with the result of reproducing similar sensitiveness to that obtained by Ackland, and that the essential conditions of such sensitiveness will be ascertained.

Doubtless the knowledge that exalted sensitiveness, such as we have referred to, is obtainable with collodion, will set many investigators to work, and it may be that we are entering upon a period as interesting as that which saw the introduction of gelatine emulsion of high rapidity. In one direction in which to work Dr. Vogel has given valuable indications, which will, doubtless, not be lost upon experimentalists.

## ON THE EFFECTS OF THE REFLECTION FROM THE SURFACES OF LENSES IN MODIFYING THE IMAGE.

BY W. K. BURTON.

It is now some months since I wrote a short letter to the PHOTOGRAPHIC NEWS, in which I expressed a doubt as to there being any advantage in a so-called "single lens" over a doublet, if the elements forming the former were not cemented. It was in connection with Dallmeyer's new rectilinear landscape lens that I expressed the opinion, and I founded what I said on what I then believed, and still believe, to be the fact, namely, that the amount of reflection from the surfaces going to cause fogging, or want of pluck in the image, is, to all intents and purposes, a function of the number of surfaces uncemented, and is independent of their form.

My letter drew a courteous and very full reply from Mr. T. R. Dallmeyer. I believe that a full correspondence on this subject in the columns of the PHOTOGRAPHIC NEWS, not of a controversial character, but directed solely towards the elimination of all error in connection with the matter, would be of great use; but, unfortunately, my distance from home makes such a correspondence impossible so far as I am concerned, and it would appear as if no one else inclined to take up the question. A regular correspondence being out of the question, I shall state my views on the subject as fully as I can in this communication.

In my first letter, I thought of nothing but the matter of reflecting surfaces as likely to affect the efficiency of the new lens as compared with rectilinear doublets, that being, indeed, the point chiefly touched on in the PHOTOGRAPHIC NEWS in the review of the new lens; but Dallmeyer points out other points wherein a single lens, even with uncemented elements, is superior to a doublet.

He mentions the colour and thickness of the elements as likely to influence the working of the lenses. It is well known that the thickness of lenses is an important element to be considered in connection with various corrections, but it was my impression that so far as speed was concerned, the thickness of the glass and the colour did not need to be taken into account, except in the extreme cases in which the lenses assume a perceptibly yellow tint through time. I have certainly been unable to discover any influence of either thickness of glass or colour in any of the lenses in my possession; that is to say, I find that, in practice, I may estimate exposures with them all, considering only the relation of corrected\* aperture to focal length. I will not venture, however, to put my limited experience in this matter against the extended experience of Dallmeyer, but will only say that I look forward with interest to an account of his promised investigation of "efficiency value."

The greater equality of illumination given with the single lens, whether with cemented or uncemented elements, I admit at once; and I admit, farther, its great importance.

As to the question of marginal definition, it cannot be

\* Corrected, in the case of doublets, for the condensation of light before it reaches the diaphragm.

denied that the quality of this is one of the most important—it might, indeed, perhaps be said to be the most important in connection with lenses. I have unfortunately had no opportunity of examining the new lens in this matter, and shall, therefore, confine myself to saying that if, with similar focal lengths and apertures, the marginal definition given by the new lens is better than that given by the best forms of doublets, this fact alone is sufficient to establish its superiority.

It is, in fact, only in the matter of the reflection from the surfaces that we differ, and I shall therefore at once state wherein that difference lies. Dallmeyer, to estimate the amount of total reflection into the camera, counts the number of reflections that are to be seen in the surfaces of the lenses, or rather that are produced by these surfaces. I contend that the number of such reflections cannot be taken as any criterion of the total amount of reflected light, an image being merely an accident due to the form of a certain surface, the amount of reflection being due to the number and area of surfaces, the relation of ratio of reflected light to total light entering the lens being due to the number of surfaces only.

The way in which light, passing through a lens into a camera, comes to be reflected at all should be first considered. The light has to pass any number of surfaces from two, as in the case of the single cemented lens, to six in portrait lenses, triplets, or lenses of the orthographic type. As the light passes any of these surfaces the greater part of it is refracted, unless the surface is at right angles to the direction of the light; but a certain amount of it is reflected, making, with a perpendicular to the surface at the point of impingement, an angle equal to the angle of incidence. In the case of the first surface that the light reaches, the reflected light is simply thrown away from the lens, and is lost; but in the case of the second surface a certain amount of the reflected light is re-reflected from the first surface, and is thrown back into the camera. In the case, again, of the third surface, a portion of the reflected light is re-reflected by the second surface, and a further by the first. In the case of the fourth surface a portion of the reflected light is re-reflected by the third, a further portion by the second, and a still further portion by the first; and so it goes on, a larger proportion of light being re-reflected for every additional surface, and this light enters the camera to the general detriment of the image on the ground glass, whether it happens to form an image which is visible to an eye placed in the plane of that ground glass, or not. It will form such an image only when the rays of light, after passing the posterior surface, are so convergent as to form an image in the air—as by a concave mirror—between the lens and the position of the ground glass, but it will act detrimentally, as diffused light, even if it be divergent.

The amount of re-reflected light—the light which does harm in the manner that we have been discussing—must, unless I am mistaken, be absolutely the same with the same number of reflecting surfaces of the same size, whatever be their form; but the amount actually reaching the interior of the camera is not of necessity absolutely the same, because a certain amount of the re-reflected light may be thrown against the side of the lens mount, where it will do no harm. So far, however, as I have been able to follow the direction taken by re-reflected light—a thing by no means easy to do, if it be borne in mind that reflected as well as re-reflected light is refracted at every surface—it is only a trifling proportion of it that is lost on the sides of the mount, so that it may be said that the amount is practically constant with constant number of surfaces and constant area, and that the ratio is constant with constant number of surfaces, without taking form into account at all. As it is really ratio that we have to deal with—that is to say, the proportion that the diffused re-reflected light bears to the refracted light that goes to form the true image—we may leave area altogether out of account, and say that the amount of harm arising from



re-reflection is due to the number of reflecting surfaces only, increasing as they increase, but in a greater ratio than the number of the surfaces—leaving out of the question, of course, the impossible case of one surface in which the re-reflection would be nothing, and between the re-reflection of which and that of two surfaces there would be an infinite ratio.

The next question that deserves a word or two of discussion is that of the influence of a stop in this matter of re-reflection, and here I must say again that I find myself at a disagreement with Mr. Dallmeyer. The following is a quotation from the letter of Mr. Dallmeyer already referred to:—"Very small apertures invariably detract from brilliancy. This is easily explained from the fact that the brilliancy of reflected images in any combination is not reduced by stopping down. This is very important, for it is evident that if the brilliancy of the reflected images be an important element in detracting from the final brilliancy of the image produced by the lens, the detrimental effect will be more and more apparent as the lens is stopped down." Now it is perfectly true that the brilliancy of the images got by re-reflection as described by Mr. Dallmeyer are of the same brilliancy whether the stop be large or small, but it does not follow that the total amount of re-reflected light is the same, and to assume from equal brilliancy of image, equal amount of re-reflected light, is, in my opinion, a fallacy of exactly the same sort that it would be to assume that a candle casts an equally bright light at a distance of a hundred feet and at that of one foot, because the flame is equally brilliant at these two distances. In the case of the candle the flame is of equally great brilliancy at the two distances, but at the greater it subtends a much less angle than at the less; in the case of the lenses the image produced by re-reflection is of the same brightness whether the aperture be large or small, but the angle through which it is visible is smaller, the smaller the aperture; or, in other words, the area of the plate over which is spread the re-reflected light from a given point of the image is smaller, the smaller the aperture. The result in extreme cases, where there are very small exceedingly bright patches of light, and where a very small aperture is used, is seen in the production of "ghost images." Indeed, if my first contention, that the ratio of re-reflected light to light going legitimately to form the image, is a function of the number of reflecting surfaces only, the second contention, that the insertion of a stop does not increase the ratio of re-reflected light, must also be granted, as it follows from the first. The introduction of a stop reduces, in like proportion, both the light that forms the image and the re-reflected light.

I hold, then, that the reduction of the size of aperture by the introduction of a smaller stop does not materially alter the proportion of re-reflected light, although it may alter its distribution so as to produce, in extreme cases, flare spots or "ghost images." The slight falling off in brilliancy, "pluck," or "snap," perceivable when a very small stop is used—generally very much exaggerated, I think—is, I believe, entirely due to the larger proportion of light scattered or diffused by diffraction in the case of a small stop than in that of a large.

A point in connection with the position of the stop is worth a little consideration. It would, at first sight, appear as if this might have a material influence on the ratio of re-reflected light; as if, for example, a lens such as a single lens, wherein the surfaces of glass are all protected from light by the diaphragm, must throw a smaller proportion of re-reflected light into the camera than a doublet lens, in which one combination is freely exposed to the light; yet I think that I can show that this is not so. It will be best, in this case, to suppose an extreme example. I shall, therefore, suppose the case of a single lens with the diaphragm first in front of the lens, and second, behind. It is evident that, in this case, the difference, as regards mere illumination of the surfaces of the lenses, is as different as it can be, and especially when a small stop is used;

and yet there will, I contend, be no appreciable difference in the one case and in the other, in the ratio between re-reflected light and light going to make the image. In the case where the diaphragm is in front, a comparatively small amount of light reaches the lens, but the whole of that light either goes to form the image, or is reflected from the lens surfaces. In the second case a much larger amount of light reaches the lens surfaces, but in this latter case the greater quantity both of what is refracted and would go to form an image, and of that which is re-reflected, is stopped by the diaphragm. In both cases, however, the ratio of reflected light as to that of refracted light remains the same, and, if the diaphragms be of the same size\* in the two cases, the actual quantity of re-reflected light will be the same. By following out the same line of argument in the case of a single lens with the diaphragm in front, and of a doublet, it will be found that the proportion of re-reflected light is the same in both of them.

The whole subject is one of great interest and of no small importance, and I wish that I could have treated it with more clearness; but I find great difficulty in finding the means of expressing, in this matter, ideas that are clear enough to myself.

P.S.—I have spoken, in the above communication, of the production of an image of a candle, in the experiment suggested by Mr. Dallmeyer, as merely an accident of the form of the reflecting and re-reflecting surfaces. This, I consider, incontestable; but I find, on farther considering the matter, that I have made a mistake in describing the conditions with which there will be re-reflection, but no visible image. These conditions really exist when the rays of re-reflection emerge from the posterior surface of the lens converging, but neither converging so greatly as to produce an air image visible from the plane of the ground glass, nor so slightly as to produce a visible enlarged reflection apparently beyond the lens. I have said nothing in my communication about diffusion of light from lens surfaces, on account of their not being theoretically true to form, but presenting a greater or less amount of rugosity according as the polishing is bad or good; yet I believe that this is a matter that is of quite sufficient practical importance to be an element of objection to increase in the number of lens surfaces.

## THE PRACTICE OF NEGATIVE RETOUCHING.

BY W. E. DEBENHAM.

No. 3.—PREPARING THE NEGATIVE TO RECEIVE THE WORK. SUCH first rudimentary attempts at retouching as were involved in the practice of filling in spots and blemishes in the negative were, as has been previously mentioned, commonly made with water colour. It was found, however, that blacklead pencil possessed great advantages as regards facility of execution, evenness of covering, and as not picking up nitrate of silver from the sensitised paper in contact with the plate.

As, however, a pencil will make but a faint and uncertain mark upon the ordinary varnished surface of a negative, and upon most gelatine films when not varnished, some preparation of the surface becomes necessary, in order that the blacklead may "take" readily.

There are several distinct methods of preparing such a surface, each method successful in its way, although for certain negatives one method may be more useful than another. One plan is to coat the plate with a varnish that dries with a matt surface somewhat resembling ground glass, and offers a "tooth" for the pencil to work upon. The formula for such a varnish runs as follows:—

Gum mastic	...	...	...	...	1 ounce
Gum sandarac	...	...	...	...	1 "
Ether	...	...	...	...	8 ounces

\* I leave out of consideration, in the meantime, the slight amount of condensation of light that will take place in the case where the lens is in front of the diaphragm.



When the gums are dissolved, the solution is filtered, and then benzole is added in the proportion of from one-fourth the quantity of ether that has been used, up to nearly equal parts. With some samples of material, more benzole must be added to produce a particular grain than with others. In any case the more benzole the coarser is the grain. The use of matt varnish was never very generally adopted, and is now mostly confined to cases in which it is desired to put work on to the back of the glass upon which the negative is taken.

Another method of preparing the surface of a negative for retouching consists in rubbing or grinding with an abrading powder, so as to get a "tooth" sufficient to take the work. Cuttle-fish bone and powdered pumice have been extensively employed, but of the two the former is to be preferred as less harsh. It is desirable not to buy the cuttle fish in the form of powder, as sold by the chemist, lest there should be in it portions of the harder shell or skin; but to obtain the fish bone in the lump, and to scrape out of it all the fine soft part, leaving out the skin or shell. The powder may be sifted through a very fine hair sieve or through muslin: enough is easily prepared at once to last a long time. A little of the powder is rubbed with the tip of the finger over the parts of the negative requiring retouching, until an even matt surface is obtained. It is generally recommended to rub with an up and down, rather than with a circular motion, but either method may be employed. When the surface is sufficiently abraded the powder is dusted off with a brush, and the negative is ready for retouching.

Another powder that has been very extensively and successfully used for preparing the surface of a negative is that of common resin. This also should be sifted, although it is not necessary for the sieve to be a very fine one, as the material is so soft, and readily crushes under the finger. With resin powder, after the work is executed, the plate may be warmed until the dull surface which the grinding has given disappears, or nearly so. The touching is thus fixed to the plate by the melting of the trace of resin left on the surface of the film.

The abrading process with resin or cuttle fish powder may be employed either upon the gelatine film itself, or upon the ordinary negative varnish; the latter plan is, however, the more usual. If the film itself is rubbed, care must be taken not to rub so much as to remove any appreciable amount of the deposit forming the image; and with some films containing a small proportion of gelatine to the bromide of silver this may not be easy to avoid. The mere fact of roughening the surface imparts a little additional opacity to the negative, so that shadows will not print through quite so clear, and too dense high-lights will be rather aggravated than otherwise. With resin powder this opacity almost, if not entirely, disappears on warming, and with either powder used upon the film before varnishing, it disappears upon the application of the varnish. In some cases, however, the added density is an advantage. In a thin and under-exposed negative the flesh in shadow will print rather lighter from the roughening treatment, something like the effect which is obtained by the plan often adopted in such a case of putting a thin wash of colour on the back of the plate. The extra density conferred by roughening will be seen very disadvantageously if the rubbing be continued on to the background, when a patch of light will be seen extending as far as the roughening process has gone. Still another method of using the resin powder is to rub the plate as already described, and then to warm it before retouching. As soon as cold it is ready for the work, which it will take in a very satisfactory manner.

Although the rubbing method has been very much superseded by the use of such a medium as will presently be described, it is really a good method, and excellent work has been done in this way. For inexperienced hands it is especially to be recommended, as there is less danger than when a medium is used of making too dark a stroke.

We now come to the plan which is in most general use at the present time for preparing the surface of a negative to receive the work of the pencil, the application to the film of a resinous or gummy solution called a medium. Several formulæ for the preparation of such a medium have been published, of which some are excellent, whilst others give so much solvent in proportion to the gum as to make too thin a solution. Some, too, contain an unnecessary complication in the mixture of gums. The writer remembers to have seen a receipt which was thought very highly of, as being that of a very skilful worker, and no doubt the medium made according to it was good; but there was, in addition to several other gums, one which is insoluble in the liquid (turpentine), whilst of the active ingredients one was resin and another Venice turpentine. As the latter substance is now generally prepared by the chemist by mixing resin and turpentine together, the unnecessary complication of the formula is obvious.

One of the first formulæ given for making a retouching medium consisted of balsam of copaiba thinned with turpentine. Two parts of turpentine to one of the balsam make a solution that works very satisfactorily. It is slower in drying than some other mediums, and on this account is perhaps not quite so suitable when the negative has to be retouched immediately that it is prepared, and put out to print directly the work is finished. On the other hand, if the work upon the negative is not finished at once, but may have to be put aside till the next day for completion, the copaiba medium is very suitable, as the pencil will still take very well, which is not the case with all mediums. Canada balsam may also be used, but will require rather more turpentine—say four parts of the latter to one of the balsam.

Of the gums that have been used for making medium, common resin and gum dammar have probably been the most largely employed. The following formula is exceedingly simple, and gives a medium which in the experience of the writer and others works thoroughly well when the negative is to be retouched within an hour or so, and not put away for a day or more, after which time, although work may be put upon it, it will be with some difficulty:—

Yellow resin	...	...	...	1 ounce
Turpentine	...	...	...	5 ounces

dissolve and filter.

Another formula—

Gum dammar	...	...	...	1 ounce
Turpentine	...	...	...	5 ounces

A convenient way of dissolving gums is to make a little bag of coarse muslin to contain the gum, and let it hang in the vessel containing the solvent, just below the surface. For making a pint or so of medium, a pickle bottle will be suitable, and the bag may be long enough for the top of it to be just nipped and retained in position by the cork. For smaller quantities a wide-mouthed bottle of the pomade kind answers very well.

The medium, if containing gum, should be filtered through paper. With balsam and turpentine alone this may not be necessary.

A very good medium for general use may be made as follows:—

Gum dammar	...	...	...	3 ounces
Turpentine	...	...	...	18 "

dissolve and filter, and add—

Balsam of copaiba	...	...	...	1 ounce
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Another very similar in use:—

Yellow resin	...	...	...	3 ounces
Turpentine	...	...	...	18 ounces

dissolve, filter, and, as before, add—

Balsam of copaiba	...	...	...	1 ounce
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A medium that comes to about the same thing as the resin medium, but may be more quickly mixed, is—

Venice turpentine	...	...	...	1 ounce
Turpentine	...	...	...	2 ounces



If slower drying is preferred, part of the Venice turpentine—say one-third—may be substituted by copaiba balsam.

Those who do not care to be at the trouble of preparing the medium will find several in the market which closely resemble in working those made by one or other of the foregoing formulae.

Any of the mediums given may be used either upon the gelatine film itself, or on the varnish. A small quantity is applied with a clean soft rag, and rubbed until the coating is even. Too much must not be removed in the rubbing, especially if the negative has been varnished, or the pencil will not take properly. The negative is then generally left for a few minutes for the turpentine to evaporate, and the medium to become hard and dry; but for some purposes, as will be mentioned farther on, the writer prefers, especially if it be a quick drying medium—*i.e.*, one without balsam—to commence the work at once.

## ACTION OF DAMPNES ON GELATINE PLATES.

BY DR. W. R. HODGKINSON.

Most of the makers of gelatine plates tell us to keep them in a dry place, and if I am not much mistaken the same advice has appeared in the NEWS more than once.

Last March I left Kensington, where I had a "dry" dark room, and came to a "high toned" south eastern suburb. I brought with me about eight dozen plates of various sizes and makes, and as there was no dark room proper, they were stored in a basement room of a non-descript character, but not "dry." Unlike the other rooms, there was no paper to come off with the general dampness, so the plaster comes off instead.

This I did not know at the time of storing the plates, and from March until this month I have had no opportunity to use any plates. I have now tried some, several makes, from boxes which are almost falling to pieces with damp, and as far as I can see they are quite as good as when kept dry.

Now what is likely to take place in gelatine exposed to damp?

It must be noticed that gelatine is not, strictly speaking, a chemical individual. We know really very little about it. The "pure" varieties—or good samples—is better—absorb a small amount of moisture from an ordinary atmosphere, but it cannot be called a very hygroscopic substance. It is scarcely soluble in cold water, and its behaviour in hot water is somewhat peculiar.

Containing water and in a moist or soft condition it forms a good bed on which to trap germs and bacteria, and probably spores of fungi, &c.; but in stiffish gelatine it is doubtful whether any spores, at any rate bacterial ones, could multiply. In the covering of a plate I think it would be quite impossible, even supposing no phenol or similar substance had been employed in the making of the emulsion. And then there are the silver salts, which, if not exactly powerful antiseptics, are rather poisonous, and are sufficiently soluble, no doubt, for this property to be exhibited.

Again, a gelatine plate can scarcely get so moist that any aggregation of the silver salt could take place in it. The only danger I can see as likely to arise from damp is that some mould or fungus might spread from or be communicated in some way from the paper boxes, which rapidly get mouldy in a damp place. The rods of ordinary green mould would certainly ruin "mechanically" the gelatine coating. But I have not yet managed to get any form of "mould" to grow on a new plate, although I have had some in a "green" box for some time.

I am now going to test this point by burying a few plates in a box amongst some decaying leaves in the garden. It is very likely that in the cases of plates being spoiled by damp the cause has been really the action of some gaseous sulphur compound from the paste, &c., used in the con-

struction of the boxes. There is more than enough sulphur in some comparatively loose states of combination, in the gluten paste used for cardboard, to spoil a dozen plates. I do not think we are yet quite clear as to how the sulphur is liberated from its organic combinations as a gaseous compound—sulphuretted hydrogen or carbon disulphide. It may or may not be by bacterial fermentation. Some complex organic compounds undergo a slow partial decomposition in cases where even the ubiquitous bacterium cannot be supposed to be at work. To mention only the substances known as sulphy-cyanides, or sulphy-cyanates, and many nitroso derivatives, which certainly slowly decompose, the former give off carbon disulphide, the latter oxides of nitrogen.

In the case of sulphy-cyanides, doubtless, water is the decomposing cause, and it is very unlikely that the state of combination of sulphur in glutinous substances is less complex than in sulphy-cyanates.

## CHAPTERS IN ELEMENTARY PHOTOGRAPHY— A GUIDE TO BEGINNERS.

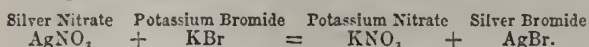
BY W. M. ASHMAN.

TENTH ARTICLE.

AN account of the more important details concerning apparatus comprised in a beginner's set as shown in the second article of this series having been given, together with such other information as appeared to the writer to be of practical interest, methods of utilising the tools described, and others not yet mentioned, will now receive attention, so that students may become familiar with the taking of photographs and kindred processes employed by photographers. The ground plan, so to speak, of modern photography, is the gelatine silver bromide process, an outcome of which we have in the dry plate of to-day. Like many discoveries of value, the rapid dry plate, as it is called, did not come upon photographers suddenly. W. B. Bolton and Sayce, of Liverpool, knew something about the possibilities of silver bromide in gelatine more than twenty years ago; Dr. Maddox worked at it fifteen years ago; Kennet patented an application of it in pellicular form in 1874; Burgess sold small quantities of emulsion the same year; and, four years later, Bennett published in the photographic Press a good, practical formula for procuring a tolerably sensitive emulsion by slow digesting at a temperature not exceeding 90° F. Since that epoch, many improvements in manipulation have been made, and numberless formulæ published, all, more or less, modifications of the original. Dry plates, it may be said, of uncertain quality, are by no means difficult to manufacture. A piece of flat glass, cleaned from chemical dirt, is coated with a tolerably thick emulsion of silver bromide in strong and good quality gelatine. The glass plate, with its covering of pale yellow liquid, is placed on a levelling table, in a cool, dark place. The gelatine sets in a jelly before the suspended sensitive molecules have an opportunity to subside, or the coating, at first regular, to alter; after which the plates are placed in a cool, dry, dark room, where drying should take place in six to eight hours. The preparation of an emulsion is simple, and full working details can be found in back numbers of the PHOTOGRAPHIC NEWS; but it is extremely probable that as regards economy, it will be found cheaper to purchase plates already prepared. What is known to photographers as an emulsion is a suspension of very finely-divided silver salts in a colloid body, like melted gelatine, or in collodion. A silver bromide emulsion, such as glass plates are coated with, and some bromide papers as they are termed, may be regarded as a mixture of silver nitrate with rather more than an equivalent weight of any of the soluble bromide salts. These agents are dissolved and mixed one after another with a warmed dilute solution of gelatine, when a reaction immediately occurs. The nitric acid, in combination with silver to form silver nitrate, becomes disen-



gaged to enter into combination with the metallic base associated with bromine, and the latter, being free, forms a compound with silver, which we desire, thus:—



Upon examining a thin film of the newly-formed emulsion on a sheet of glass in daylight, the colour will appear red, and in this state sensitiveness to light is not great; but if it be subjected to the action of free ammonia or heat, the molecules undergo a change of colour, eventually becoming grey, which is known as the blue stage. Exalted sensitiveness has been reached when the change of colour just indicated is seen, but if carried beyond this point there is danger of an emulsion wanting in vigour, and liability to yield foggy images. The necessary quantity of gelatine to produce a good workable film is next added, and when thoroughly dissolved, the whole is allowed to become cold. The resulting yellow jelly is then broken up into small fragments or shreds, and subjected to copious washing in cold water, in order to remove the soluble salts produced by the reaction above-mentioned. The cleansed shreds are collected, drained, re-melted, filtered, and while the liquid is warm, surfaces of glass or paper may be coated.

Presuming that a stock of commercially prepared plates have been purchased, it is advisable to ascertain whether they be what is known as "ordinary rapid," very rapid, or slow. This information is usually conveyed by a statement upon the label of the package, and in some instances a sensitometric register number is also given, while other makers of plates state that the sensitiveness of that particular batch is so many times more rapid than wet plates, which really has no intelligible meaning to the majority of photographers, many of whom know very little of the capabilities of the "Wet Collodion Process."

As the sensitiveness of a silver bromide emulsion is regulated by the manner of preparation, so does a reliable means of registering the speed of every batch become essential to the guidance of those who make use of the plates. This we can ascertain by the aid of an instrument termed a sensitometer, which anyone can make for themselves. The conditions to be complied with are as follows:—A dark box or chamber for the reception of the plate to be tested. A constant light, the spectroscopic test of which indicates a similarity in richness of actinic rays (see sixth article, page 518) to that of ordinary daylight, and a screen or other means of diminishing the intensity of the light. Spurge, whose name is frequently mentioned in connection with the subject of sensitometers, has selected a small gas flame, the centre of which he uses as an illuminant, and the area of a hole in a darkened box through which the light reaches the plate has a greater or less influence according to the diameter of the aperture and sensitiveness of the plate. In the Warnerke sensitometer the source of illumination is a phosphorescent tablet excited by burning an inch of magnesium ribbon near the surface; between the tablet and sensitive plate there is a screen (a carbon transparency) of a series of curtains, the obstructing power of which provides a definite scale of opacities. This arrangement bears a series of numbers ranging from one to twenty-five degrees, and the period of exposure given to any plate for comparative tests is fixed at thirty seconds. Given plates of different rapidities, the kind usually called "slow landscape" may be expected to show in the Warnerke sensitometer the figures twelve or thirteen; plates of ordinary rapidity, fifteen to eighteen; and rapid plates, twenty-two to twenty-five.

The practical value of this instrument will be apparent when it is remembered that every advance of three numbers higher in the scale means that a plate recording this higher number is twice as rapid as a plate upon which the lower registration appeared. A plate registering 22° has four times the speed of a 16°, and a 25° plate eight times. Fig. 18 illustrates the Warnerke sensitometer.

It is supplied commercially by Marion and Co., Soho Square, London, W.



Fig. 18.

A, screen of various thicknesses of pigmented gelatine; B, grooved frame to hold A and sensitive plate; C, phosphorescent tablet; D, shutter sliding between A and C; E, solid back of frame; F, spring to press plate and screen A in close contact.

Attention having now been drawn to the sensitive condition of the plates which have to be used, and the importance of employing cameras and dark slides in a perfectly light-tight condition, it will be sufficient to once more impress upon the reader the necessity for caution in the dark room. Plates must not be exposed to the light pervading that apartment longer than can be avoided, whether a ruby lamp or any other source of illumination be employed. This condition recognised, we may proceed to open a packet of plates, dust the surfaces with a camel hair brush, and fill our dark slides ready for immediate work.

#### PRESS NOTICES ON THE PHOTOGRAPHIC EXHIBITION.

The BAZAAR says:—

This Society holds its show in the usual Gallery—that of the Royal Water-Colour—and provides a very good exhibition indeed. It seems impossible that camera, developing, and printing can possibly be brought to greater perfection than they have now reached. There are good portraits in plenty, but they no longer take the major portion of walls, for landscape, figure, and sea studies are at once more pictorial, more exacting of knowledge, care, and artistic feeling in the operator, and altogether more replete with difficulties—so speak more decidedly as to the advance of the art. Art is not the word we quite like to use for a process which is mechanical; for there is no doubt that without some artistic sense a really good photograph cannot be produced. The exhibition shows this, for there are instances of wonderfully fine tone, clearness, and natural beauty in views that are spoilt by the figures introduced, and others of landscape alone are too full. A painter would be able to leave out what points interfered with due artistic arrangement; but as sun-pictures are fac-similes, the photographer should forswear places that are too crowded or unbalanced in composition. In face of so many lovely things which are really charmingly pretty pictures, to say nothing of their technical merits, it is captious to allude to the few specimens which take no rank. We cannot enumerate even half of those which are first-class, for a vast number of exhibitors are on a par as regards excellence.

There are many new processes, but very few are superior to platinotype, and in this we almost give the palm to Mr. Gale, for his series of small views, 73 to 83, are gems in every sense. One, "Sunshine and Shadow," is brilliant in its warm sunlight and clear transparent shadow; clouds in others are soft and valuable to the scenes; and of those with sheep or horses (81 to 83), a visitor remarked, with some degree of truth, that they were quite Rosa Bonheurish. Mr. S. Bourne, too, has some beauties in "Sherwood Oaks" and "Spring Time." Once upon a time a photograph meant only one thing, and that a black-brown print with remarkably little definition of detail, and no regard for light and shade beyond those of the boldest contrast. Now, the variety of colour, tone, and "expression," is endless,



and the word photograph hardly implies what is the result of bromide paper, stripping-film, aristotype, Pizzighelli process, opal, paper negative platinotype, silver, carbon, autotype, &c. What we note most as marked improvements are that skies are no longer bare white backgrounds, but are often clouds that are quite luminous (see the margins of some in Mr. W. Bedford's rich red-brown prints of Snowdon—251 to 254); that figures which are the principal objects of interiors or exteriors are in natural attitudes and of unconscious mien (see the family group "At Home," 38, by Mr. Lyddell Sawyer; and Mr. J. Chester Jarvis' "Blind Man's Buff," 7; "Punchinello," 5; and others); that portraits have more tenderness; and that reflections or shadows are not only given well, but are made use of as agents to the beauty of the picture. So delicately do the lens and printing processes work, that thickets of wood do not come out as a blurred mass all on one plane, but perspective is given, and yet the softness of undergrowth is neither sacrificed to sharpness of definition nor merged into hazy nonentity. Some of this class are as delicate as fine engravings, and are not small. Mr. Harry Tolley's "Happy Childhood" (15), and especially Mr. H. Forsyth's lovely brook meandering through copse and bramble, "A Rustic Corner" (42), are capital examples. As evidence of clean, good work and limpidity of reflections in water, Mr. Seymour Conway's "Easing Bridge, near Godalming" (102), may fairly be cited, for it is gentle throughout, and the subdued light under the wooded bank is given splendidly. Another admirable effect of light is that which penetrates through the mists of "Early Morning" (182) on an upland that is being harrowed. It is by Mr. Frank M. Sutcliffe, who has some score of good things, among them two remarkably executed figures, "Farmer's Wife" (131) and "Batch" (130).

In the place of honour is a very large and thoroughly pictorial piece of humorous character by Mr. G. Renwick, who has been fortunate in his model of the wooden-legged man to whom an imp of a shoeblack says "Shine yer boot!" (178). It is extraordinary as being of such large size, and with every portion of it well brought out, yet neither hard or dead. Below it is an interesting set "In Tokio, Japan," by Mr. W. K. Burton, and not far to the right is another series by him still more interesting, and also awesome in the way they spirit us to the edge of craters on "Mount Bandaia, Japan" (224). In portraits there are life-sized heads, by Elliott and Son, of "W. Morris, Esq." (399), and "B. J. P. Bastard, Esq." (378); smaller in size is "Miss Stillman" (397), by Mr. H. H. Cameron, very tender and nice; several exquisitely produced likenesses of gentlemen, by Mr. R. Faulkner, who uses a very dark background, and whose platinotypes (379), and "G. Macdonald, Esq." (376), have every appearance of being the finest steel plate engravings. Mr. R. Faulkner has great success with children, which he takes instantaneously, but the male portraits alluded to are as fine as anything could be, nor do they give the impression of being too much touched. There are no frames of animal portraiture this year, and none or next to none of flowers; but in yacht racing, Messrs. West stand first, and Messrs. Symonds are almost level with them, so silvery, fresh, brisk, and well shaded are their scudding yacht scenes. Among the photographs we marked as quite of the best were "The Norfolk Broads," by Mr. E. A. Maxwell; "Stybarrow Crag, Ulleswater" (95), Messrs. Green Brothers; "Pont Aberglaslyn" (171), an enlargement on opal paper from stripping film, by Mr. Herbert G. Moberly; "A Hunter's Head" (196), very forceful and picturesque, by E. Rabending, who likewise has some original portraits of children; "Engadine Mountain Views" (221), Mrs. Main; some extensive landscapes by Mr. Vernon Heath, who excels in "Bleaven, from Scourna Gillean, Isle of Skye" (241), which ought to have been hung lower; refined work and well selected "Country Scenes" (263), Mr. W. Waiwright; Mr. Gridley's distinct "Roman Ruins"; Mr. Bedford Lemare's successes with interior architecture; the clever firelight "Reflections" (295), by Mr. W. Gillard; Capt. Abney's and Mr. G. Edwards' views of glaciers and peaks in Switzerland (315 to 320); the marvellous precision and relief of still-life objects in "The Christmas Hamper" (331) of Mr. Lafosse; "By the River Itchen" (335), Mr. G. Davison; and "Berkshire Views" (347), Mr. J. C. Andrew. There is a good collection of typographe and photographe pictures, some of which we have already remarked upon in our notices of art periodicals.

The LINCOLN GAZETTE says:—

Close on the heels of the summer holidays comes the Photographic Exhibition, which, as usual, takes up its quarters in

Pall Mall East. Startling novelties are hardly to be looked for, but although the art has reached a point which it seems difficult to carry further, yet there is no such thing as standstill. There is a constant endeavour to raise the standard of excellence, to beat the record, and the chief result of the latest improvements is a wider adoption of permanent printing, platinotype and carbon being the favourite processes. No wonder the exhibition is crowded by amateurs eager to compete with the professionals, and to study the newest developments in methods and apparatus. The portraits are plentiful as autumn leaves. Amongst the most stared at is the Cabinet Minister group, the members of the Coercion Government in happy family union. The handsome man of the collection is Sir Michael Hicks Beach, and the most animated Mr. Ritchie. Photographers are finding out by degrees how best they can do justice to the soft outlines of women, and certain platinotypes (169 and 179) show a most effective advance in female portraiture. There are no hard exact metallic outlines, but faces, figures, draperies, are gently touched as if with the painter's brush. Mr. T. Gale's groups are once more the admiration of his fellow-workmen. He dexterously contrives to unite pastoral scenes with groupings of people, and manages to give to the combination an appearance of spontaneity. The Exhibition contains admirable examples of flash photographs—of yacht races taken from a sailing boat, of foot races giving the figure in intense action—and it abounds with interesting specimens of scenery, of views taken in every part of the British Isles, and in Switzerland, Portugal, and Japan. But the real novelty, the one thing nobody has ever seen before, are direct photographs from the ruins of Palmyra. Many travellers have been to Palmyra and brought home descriptions of the mighty remains of this City of the Desert; but now for the first time the giant monoliths, the amazing colonnades, the tombs, and the Temple of the Sun have been fixed by the camera. The feat has been achieved by an American, Mr. Horace W. Gridley, who by special Turkish permit camped on the ground, taking with him soldiers, tents, camels, and a whole Eastern caravanserai. We have sixteen originals from his own negatives, with admirable autotype enlargements of two of the principal scenes. Twenty years ago a Frenchman made the same endeavour as Mr. Gridley, but he failed to carry with him fresh water, and the sulphurous water of the desert destroyed his negatives. Those who look upon these stone fragments, that for thousands of years have survived the shocks of time, and who care for something more than the history conveyed in the photographs, should read, in Lady Burton's "Inner Life in Syria," her excellent account of a journey, made in company with her husband, from Damascus to Palmyra or Tadmor in the Wilderness, the city of which Zenobia was Queen. The ruins, says Lady Burton, so gigantic, so desolate, rise out of a sea of sand, in which they are half sunk, sands which stretch away on all sides—"shut your eyes and think of a city composed of streets formed of colonnades cross-barring one another, each one beginning and ending with a temple, and you see Palmyra." These photographs alone give distinction to the present Exhibition, and archaeologists, biblical students, and the public will flock to see them. There is, however, little time to be lost, the Exhibition lasting only a limited time, and closing in mid-November.

#### A MODIFICATION OF THE METHOD OF LIFTING GELATINE NEGATIVES.

BY A. PUMPHREY.\*

I AM bringing before your notice a modification of the usual methods of stripping or lifting gelatine films from the glass support, and will give you a demonstration of the method of working. It is very simple and certain in its action. I say a modification, as the materials used are made to some extent already, but the application is altered, and is so simple that it might be called a new process.

It consists of applying a film of gelatine film on paper support moistened with a diluted solution of hydrofluoric acid to the surface of the dry-plate negative. The acid passes through the negative and loosens the film from the glass, and at the same time it holds the negative firm and prevents it from frilling, which is always a source of trouble in using the hydrofluoric acid.

The details of the method are these. A film of plain gelatine supported on a stripping supports such as is used with my lifting

\* A Communication to the Birmingham Photographic Society.



films is soaked in a diluted solution of hydrofluoric acid—1 part of acid to 60 parts of water—for three minutes. It is then squeezed down on the surface of the negative so as to bring the moistened film into close contact with the negative, and to exclude all air-bubbles, and placed on one side to dry for about half an hour. The support can then be stripped off with the negative film adhering to it. This is then placed on a wood board to dry, the edges of the paper support being fastened down with pins to keep it flat. When the whole is dry, it is taken from the board and a knife inserted between the stripping back and the film, which is easily stripped, leaving a negative which can be printed from on carbon or otherwise from either side, and of easy portability?

### Notes.

Contractors who scamp their work have a holy horror of the detective powers of photography. A case in point occurred very recently in New York. A cavity was discovered over one of the arches supporting the Croton Aqueduct, and as no cavity should have existed at all, but should have been filled with rubble masonry, it was resolved to photograph the defect so as to convict the contractor. However, on a photographer attempting to set up his camera he was informed by the superintendent of masonry that he had orders to prevent, by force if necessary, any attempt to photograph the work. Another photographer, an amateur, then made an attempt, but he, too, was unsuccessful. Though no photographs were taken, it is pretty clear the contractors, by their dread of the evidence, admitted their guilt. We have heard of similar proceedings in London, notably in a case where a large iron shed fell in the neighbourhood of King's Cross, and where the photographer's aid was called in to decide whether the building had been properly erected. In this instance both camera and dark tent were overturned.

The difference of opinion among the newspaper critics on the discontinuance of the medal system at the Photographic Exhibition is very instructive. The *Daily News*, as we noticed last week, thinks the Exhibition must be below the average, because the Council had not been sufficiently satisfied with the competition to award the medals. The *Saturday Review* does not think the withdrawal of the medals has made any difference. Photography, it says, may be said "to have passed beyond the stage when medals are a useful means of encouragement." The *Aberdeen Free Press* considers that the present display is not so good as in years past, and this shortcoming is due to abolition of the medal system. "There is," the *Free Press* has discovered, "a distinct feeling among photographers that the Council of the Society have taken a retrograde step in thus abolishing the incentive to meritorious work." The *Illustrated London News* cannot see any falling off, despite the withholding of the medals. The *Morning Advertiser* approves the step the Council have taken, and thinks the Exhibition more than ordinarily interesting. Neither the *Graphic* or the *Telegraph* comment upon the absence of medals, and both speak in praise of the pictures. On the whole, it cannot be said that the opinion of the *Daily News*, which evidently knows little of photography, and that of the *Aberdeen Free Press*, which knows less of the feeling of photographers, weighs against the opinions of the other papers.

A letter signed by J. Janssen and A. A. Common has been addressed to astronomers interested in astronomical photography to the effect that in accordance with the wish expressed by the Astro-photographic Congress of Paris, they were now occupied with the constitution of a committee to study the best methods of working, and to collect results obtained in celestial photography other than the photographic chart of the heavens (which is in the hands of the committee of the congress). The writers ask for the co-operation of those interested in the work, and add that next year, when scientific congress will be held in Paris, they intend to call together those who have thus expressed their adhesion, in order to constitute a committee to examine the questions to be thus considered.

The Farthing Post Card Company does not quite relish our suggestions as to means of dealing with their post cards, and T. Norton, writing to *The Star*, raises purely imaginary obstacles to the course we suggested; but the only real obstacle will be the impossibility of purchasing the cards at the rate of a farthing a-piece.

First, Mr. Norton tries to convey the notion that it will be impossible to obtain an allowance for the spoiled stamps at Somerset House, although he knows better than to definitely say that the allowance cannot be obtained. He also suggests purely imaginary difficulties about the process of blotting out the advertisements and selling the restored cards, which he assumes would have to be done surreptitiously. To print a dark impression over the marginal advertisements would cost about twopence a thousand if done on a Magand machine, while to first print a dark tint over the whole card to obliterate the advertisements, and then a white tint on top so as to leave the whole a pleasant grey, might cost fourpence a thousand. If the work were properly done, and done as a printer of our acquaintance is prepared to do it if he could only get the cards, the increase of weight on each card would be less than one-fourth of a grain.

The exhibition of amateur photography opened at Vienna a few days ago has an element of novelty. It is, we are told, in connection with the Emperor's Jubilee, and the exhibitors in the show belong for the most part to the aristocracy of the Continental countries. This fact alone ought to attract the multitude. Whether the pictures are good or bad will not matter so long as they have been in contact with royal fingers. Photographers, however, will look upon the exhibition with different eyes. They will be inclined to ask unpleasant questions as to how much of the photographs has really been the work of the royal amateurs, and how much that of their assistants. We are inclined to think a little information on this point would open up an important subject for discussion at our various photographic societies—namely, what part royal amateurs should play in the taking of photographs to entitle them to be called the authors of the works exhibited. Say, for instance, the assistant prepares everything, including the selection of the view, and develops the negative, but leaves to the prince or princess the squeezing



of the pneumatic ball or the releasing of the spring of the shutter: would the latter act be sufficient to justify the person performing it calling himself the photographer? If this matter could be settled, the work of the critics who attend such exhibitions would be made much easier.

It was a happy idea to photograph the "last wait" on the occasion of the last night of the Burg Theatre, Vienna, this week. This has always been one of the most popular theatres in the city, and as early as 6 a.m. the patient crowd began to assemble. Many of them were known, from their frequent attendance, to the theatre beadle, and called by name by him; and the photograph which was taken in the afternoon will immortalise a number of enthusiasts whose lives seem to be spent in going to the theatre. We have people in London whose tastes take a similar direction, but their enthusiasm is confined to "first nights." They care for theatres on no other occasions, but to attend a first night will put themselves to any amount of inconvenience. Why they should delight in seeing a play in its incomplete state is so much of a mystery that a photograph ought to be taken of a crowd of "first-nighters," so that the prosaic world may see what kind of people these enthusiasts are. A new opera by Gilbert and Sullivan always presents a favourable opportunity for this. When "Ruddigore" was produced, the gallery began to gather at noon, and we believe that the "Yeomen of the Guard," last week, brought the enthusiasts together at a still earlier hour.

It would really seem that a file of this journal is carefully kept by one of those enterprising "liners" who purvey what may be called "silly season" sensations for the Press; for it is otherwise difficult to account for the periodical persistency with which, year after year, during the dull season, the details of what are usually impossible photographic feats and impracticable photographic suggestions are reproduced from these columns, where they have been, so to speak, "pilloried" at the time of their first evolution from the brain of some too ingenious American pressman. Thus, only a day or two ago, the familiar statement reappeared relative to the imminent supersession of the human judge at present employed at race meetings by an automatic camera which would photograph the horses as they flashed past the winning post, and thus make any dispute as to the actual winner an impossibility. It is at least three years ago that we first alluded to this then novel proposal, which is now, we notice, to be "hand-selled" on a race-course near Paris. Three years ago it was, according to the original valuer of the notion, to be tried at Newmarket forthwith; though we need scarcely say that it has, in the interval, been tried neither on what sporting reporters call the "historic heath," or anywhere else. Last year, very much about this date, if we remember aright, the "liner" took a yet bolder flight, and actually wrote of experiments having been made—not in England, need we add?—but at some conveniently vague trotting meeting in the States.

We do not propose to repeat here the evident reasons why this revolution in racing custom is not likely to take place

either on a race-course near Paris, nor on the "historic heath," or anywhere else, save in the fertile imagination of the "silly season" paragraphist. But a moment's consideration will suggest a dozen practical suggestions to the installation of Judge "Camera" on modern race-courses in the sentry-box-like structure opposite the winning post. Imagine, for instance, the temptation there would be to render important races abortive by tampering in a scientific, rather than a moral sense, with the new automatic judge. If horses are now "hocussed," it is certain that, under the new *regimé*, lenses would be abstracted and dry plates spoiled when unscrupulous rogues wished to prevent a "big event" being decided. Think, too, of the maddening state of public excitement, as an uproarious race-course crowd vainly clamoured for the official announcement of the result of some classic race.

Unless the luckless operator charged with the duty of developing the all-important negatives were shut up in an iron-clad and bomb-proof dark-room, the odds are that he would be torn in pieces by an eager mob long before he could possibly reach the end of his task. But enough. It is but poor sport to re-kill the slain, and we can safely leave our old friend "Judge Camera" in the grave in which stern facts have once more laid him, till some journalistic body-snatcher again tries to galvanise him into the semblance of life and actuality when next silly season shall have come round to us.

#### ANOTHER AMERICAN FLASH-LIGHT STORY.

THE *New York Sun* says:—

A ceremony which changed Mrs. Blanche Seaman Brown, a concert and opera singer of some note, and the widow of a New York business man, into Mrs. Charles Sprague, the wife of a young and wealthy country editor of Ohio, and the son of the Hon. W. P. Sprague, for several terms the representative in Congress of the fifteenth Ohio district, took place in the chapel of Netherwood, a suburb of Plainfield, N. J., Wednesday evening last.

The pretty little chapel had been beautifully decorated with flowers by the ladies of Netherwood, friends of the bride, and a distinguished company had been bidden to the ceremony. The bride has dabbled in photography herself in an amateur way, and it struck her that it would be nice to have a picture taken of the bridal party, and of the flowers and the friends as they appeared just after the ceremony. So Photographer F. C. Langborne, of Plainfield, was engaged to come with his instantaneous apparatus and his magnesium cartridges, and it was arranged that, after the ceremony, those present should form an artistic group about the bride and groom in front of the chapel and be photographed.

Mr. Langborne was stowed away in an eligible position at the rear, and promptly at 7 o'clock, the chapel being filled with richly dressed men and women of the neighbourhood and of New York, the bridal couple stood before the Rev. Mr. Sampson, pastor of the church, and the ceremony was begun.

The groom is tall, slender, and pale. A brief moustache and a boyish look are some of the evidences of his youth. The bride is a plump, pleasing personage, with brown hair, bright eyes, and just tall enough to reach to the groom's shoulder as they stood there. She wore a magnificent costume of white satin, with a sweeping train. Pearls were sown thickly over the bodice, and diamonds sparkled abundantly about her.

The women had all finished saying, "Oh, my! isn't she too sweet?" and the men had quit nudging one another and exchanging glances by the time the minister was through asking Blanche if she would have Charles, and Charles if he thought he would like Blanche for a wife. There was a solemn hush in the church as the minister slowly proceeded with the beautiful



service. At last the ring was properly on, the fateful sentence had been pronounced, the bride and groom stood facing each other with hands clasped, and beside them the clergyman, facing the audience, raising his hands to begin the benediction, said: "And whom God has joined together—"

There was a sudden crackle, an instant's sizzle, and then a loud puff as of the explosion of a quantity of loose powder, while the chapel was filled with a blinding glare as of a flash of lightning. Women cried out, men sprang to their feet, the minister stood speechless, the groom raised his hand up and dropped his jaw down till he seemed miles above the shrinking bride, who was frightened out of four of her five senses, and only thought of fainting.

The photographer back in the rear smiled a smile that was all his own, and deftly laid away a plate where the light couldn't get at it.

It was over, noise, glare, terror and all, in an instant, and the minister said his last sentence over again without interruption, but in a distinctly injured tone of voice. It is said that he finds it hard even yet to forgive the couple for the fright he had, while others of the church people are said to be shocked at such goings on in a church. The groom doesn't worry so much over the sacrilege as he does over the looks of it.

The consternation which the flash light of the photographer caused among the guests, however, was but a feeble shock compared with that which will be experienced, Mr. and Mrs. Sprague expect, to some folks back in Ohio by the event which the flash light illuminated. The general idea in that part of the country has been that Mrs. Brown has come east to marry some other man, and that Mr. Sprague was going west to marry some other woman. Mr. Sprague's father, and Mrs. Brown's mother alone shared the secret of the exact cause for the recent departures of Mr. Sprague and Mrs. Brown from McConnellsville, O., which is the home of the groom and the place where the bride has been living this summer.

#### A NOTE ON HYDROQUINONE DEVELOPMENT, WITH ILLUSTRATIONS.

BY J. B. PAYNE.\*

For some time past considerable attention has been given to hydroquinone as a developing agent, and a large number of formulae have appeared in the pages of the photographic journals. In order to thoroughly test the merits of this re-agent, I requested Mr. Green (operator for our firm) to make a collection of these published formulae, to test them on various makers' plates, and carefully note the results. This series of experiments has taken up the spare time at his command for several weeks, and the results have proved extremely interesting and useful. Mr. Green has not been able to carry out these investigations sufficiently to enable him to state definitely the merits and demerits as between pyro and hydroquinone. The latter, however, proved in one direction to have a very marked advantage over pyro, and as this is somewhat important, and has special interest just now when taken in connection with an article which recently appeared in the *British Journal of Photography*, on "The Keeping Qualities of Dry Plates," I took the earliest opportunity of bringing the matter before you.

In the article alluded to, the writer calls attention to the trouble experienced by iridescent stain and fog. It is known to most of us that this surface fog is easily removed by the application of methylated spirit, but none of us care to have the trouble if we can avoid it. We found that plates which gave the surface fog with pyro and ammonia development showed not the slightest trace of it when developed with hydroquinone. I here exhibit a half-plate negative which was first exposed, then cut into two, one half being developed with pyro. This portion shows the iridescent stain. The other portion was developed with hydroquinone, and is, as you see, quite free from it.

Hydroquinone appears also to have an equally marked advantage over pyro when used on plates which give a nasty copper-coloured fog in the film, as you will see from the negatives before you.

In the various formulae for development with hydroquinone which have appeared in the photographic journals, there has existed one serious objection to its adoption by the busy photographer, viz., the extreme tardiness of development. With the appended formulae the average time of development for a properly

exposed plate is from two and a half to three minutes. In a correctly exposed "Mawson" plate the high lights begin to appear in about thirty-five to forty seconds, and then the first appearance of the image is rather deceptive, showing, as it lies in the tray, every indication of a harsh, under-exposed negative; but this gradually disappears, and development proceeds more rapidly towards completion.

It is a more agreeable developer to work with than pyro and ammonia, can be modified to give any degree of density, or to bring out detail in cases of under-exposure and instantaneous work, and possesses some advantages over the latter, such as freedom from surface fog, green fog in its various forms, and, not the least important, in the substitution of caustic potash for ammonia, we have an alkali of a much less variable nature to deal with.

Meta-bisulphite of potash, the best known preservative of pyrogallie acid, promises to be equally efficacious in preserving hydroquinone. A sample we have had in solution for six weeks shows no sign of deterioration.

- |                              |     |     |     |           |
|------------------------------|-----|-----|-----|-----------|
| 1.—Hydroquinone              | ... | ... | ... | 4 grains  |
| Meta-bisulphite of potash    | ... | ... | ... | 4 "       |
| Bromide of potash            | ... | ... | ... | 1 grain   |
| Distilled water              | ... | ... | ... | 1 ounce   |
| 2.—Potassium hydrate (stick) | ... | ... | ... | 10 grains |
| Distilled water              | ... | ... | ... | 1 ounce   |

Equal parts of 1 and 2.

#### PHOTOGRAPHING ANIMALS IN MOTION.

BY MAX BOLTE.

PROFESSIONAL photographers are often called to photograph a horse, a pet dog, groups of cattle, &c., and although this class of subjects require special apparatus and peculiar skill, it, nevertheless frequently happens that very acceptable results are obtained. Amateurs often try their skill at this class of work, and even if they do not mention how many failures they had before they succeeded in getting only one good negative, we comparatively often hear of good work done by them.

At all events, it is an admitted fact that photographing animals is not so easy as generally supposed, and it is much more difficult than to take a landscape or seascape view, and even more difficult than to take a maritime view. To photograph an animal, for instance, a horse, or a setter dog, offers its difficulties, for even if they obey a word of command, it must be borne in mind they are only animals, and that their understanding is not that of a man, and, besides, what do they care to be photographed to the best advantage? Anyone who has ever tried to photograph cows will have noticed that they become uneasy as soon as the photographer approaches with his camera and focussing cloth, &c. Nevertheless, these animals can be photographed with comparative ease, and it is only necessary to take them with a detective camera.

To photograph a horse jumping over a fence, or a setter-dog pointing, may also be accomplished in the same way, and when a detective camera is used, the difficulties are not nearly so great as when a camera resting on a tripod is used.

In all these cases the photographer can secure a sharp focus, can draw the slide from his plate-holder, and watch the proper moment to take his shot.

Of course, in order to produce a good photograph of such a subject, it is not only necessary to have a rapid lens, a fast shutter, and a highly sensitive plate, but it also is necessary to have some knowledge of the laws of painting, and chiaroscuro, that is the contrast of light and shade. When the animal is light-coloured, or even white, it is highly advantageous to select a dark background—for instance, dark green bushes, and *vice versa*—and always do the best to get the animal as well lighted up by the sun as possible. Many exposures are given either too soon or too late—that is, the photographer presses the bulb of his pneumatic shutter release at not the proper moment, and here is the great point which requires not only study, but also practice and calmness. A finder attached to the front board of the camera is a great help, however; there is no absolute necessity for it if the photographer is well accustomed to his apparatus, and has made certain marks on the camera, back and front, as for instance, a little screw projecting  $\frac{1}{4}$ -inch on the front board, and another screw on the upper back of the camera, this latter screw covered by a semi-circle of brass of about  $\frac{1}{4}$ -inch diameter. This latter contrivance is peculiarly useful when resting the

\* A communication to the Newcastle-on-Tyne and Northern Counties Photographic Association.



camera upon the left shoulder, and supporting the front of it by the left hand or elbow.

I do not pretend that this way of holding the camera is the only appropriate one, for there are many photographers who have adopted other styles, but I have personally found it in practice to be the most handy and agreeable one. My way of proceeding is to close the shutter, draw the slide of the plate-holder, and allow the camera to point vertically. I now walk on and watch the animal as well as the distance, and when up to the point, I slide the camera to the corresponding focus mark on the lid of the camera, raise same to a horizontal position, resting it, as above-mentioned, upon arm and shoulder, and take aim, and at the right moment press the bulb of the pneumatic release.

Now as regards the most convenient outfit for this class of work. The first requisite is a good lens of the rapid rectilinear style; and if possible a lens with a good deal of so-called depth of focus should be chosen, for no matter how expert one becomes in estimating the distances, he never will guess it right up to the margin which a lens of very little depth of focus admits. The further explanations which I shall give will give a clearer description of the foregoing assertion. The camera should be not too large; up to eight by ten is all that can be handled with satisfaction. The focussing adjustment should not be of the rack and pinion movement, but should allow the camera to slide easily upon its bed. It is a good dodge to take the camera from its bed and apply to all parts which are movable some graphite. The same should be done with the slides of the holders. In selecting a rapid shutter it is good to ascertain that it works as fast as one-fiftieth of a second, that it is free from vibration and absolutely light-tight, and furthermore that it has a pneumatic release. When all things are in readiness the camera and shutter should be submitted to a serious examination in broad sun-light, in order to discover any leaks or imperfections, for as highly sensitive plates will be used, and as it often may happen that the slide of the holder is drawn some time (often longer than expected) before the exposure is made, the most diminutive imperfection or leak would cause trouble and fog the plate. The examination of the lens with regard to its depth of focus, angle of view, &c., should be made in the well-known way. Next, the marking of the different focus distances upon the camera bed should be made. An efficient way is the following:—A large portrait, one of life-size or one even still larger, is tacked to an easel or a wall, using a plumb-line to insure its vertical position, and to be marked upon the ground, the following distances are measured out: 125, 75, 60, 50, 35, 20, 15, 10 and 5 feet. The camera is placed upon its tripod, and a plumb-line is hung from the diaphragm of the lens. The next is to bring the camera to the distance of 125 feet from the easel to the plumb line of diaphragm of lens, and having a small piece of white celluloid or ivory of about 4 by  $\frac{3}{4}$  inches ready; this piece is placed in a convenient position upon the bed of the camera (by preference to the left), and is held there in position by means of a screw. The focus is now taken as sharp as possible. It is even advisable to use a magnifying glass for this and all the other focus markings. There should be a little rule or an index attached to the camera, and in such a way as to indicate the position of the camera upon the celluloid strip, and all corresponding markings should be made by this index upon the celluloid plate. All the different focus marks are marked upon the plate referred to. Upon examination of the celluloid plate it will be seen that there is not a great difference between the focus marks for 125 to 60 feet, but that the distances from 60 down to 5 feet increase in an extraordinary way. The different markings, in order to render them more apparent, should be marked in black, and in placing the corresponding numbers of feet always in alternation, that is, one number to the right and the next to the left, and so on, for this way of marking allows of employing larger numbers, and it is easier seen whilst sliding the camera when working afterwards.

There is still another precaution to which I will call attention, and that is the use of a cover for the camera. A bag made of yellow or red and black twill, made in such a way as to allow the placing and withdrawing of the holder and its slide, is a great advantage, for it protects the camera and allows of withdrawing and reinserting the slides with not such extraordinary care as without this cover.

Many of us have heard of or have seen the excellent photographs of animals which Ottomar Anschütz, of Lissa, produces; and it is only too natural that these rare specimens of perfection should awaken the desire of many an amateur to "go in" for this class of work.

True, Anschütz's photographs are so far unrivalled by anyone, but it must be borne in mind that Anschütz neither is an amateur nor an every-day photographer, for he is an artist who has studied many a year, and who is gifted not only with unusual practical skill, but also with artistic feeling, and, unfortunately, this latter quality is not obtainable in any drug store or at photo stock dealers. The proceeding which Anschütz employs is a peculiar one, which nothing but experience and observation of nature have shown him.

Those photographs of foxes, deer, cats, monkeys, &c., it must be understood, are not the result of the first attempt; oh, no! who knows how many days he has kept them company—how many long hours he has been watchful and patient? It furthermore is evident that those animals were taken whilst they were under the impression that no observer was present. The human eye has a peculiar power over any animal, and none of them can bear a steady look for even a few seconds only. In many cases it is good to leave the camera readily focussed, with the slide drawn, and go away from the animals to a hiding-place, to which the rubber tube of the shutter has been conducted (or even electrical releases are employed), and from this place watch the animals, only releasing the shutter when the animals are at ease and in the desired position, &c. It is easier to photograph animals which are in cages, for there they are not at liberty to move much, and we can approach without fear, not so much for us as for fear to disturb them; for those animals, as kept in menageries and zoological gardens, in a certain way, have got accustomed to the presence of men, and as a great observer of animal life said, "they are no more the genuine tiger, lion, or monkey, than they were when still at liberty." This is what Ottomar Anschütz aims to avoid, and if he has mastered it, it must be left to any one to judge who sees his admirable photographs.

A detective camera, having no bright and shining brass parts, under all circumstances is the most convenient for taking such photos, and a good plan is to take the animals as much unawares as possible.

Furthermore, it is good not to try to take the animals at too short range, for even if the image will be larger upon the plate, there will be less details in it. The law of the reflected rays should be borne in mind. An instantaneous picture, taken at 15 feet distance, will not yield such a fine plate as a sharply focussed plate taken at 30 feet. Detective cameras generally are made with a focussing adjustment, but they have no swing-backs, and it is easy to tell if a picture has been taken with a detective camera or not.

The reason why I recommend the use of a camera with sliding focussing adjustment is the consequence of a late experience, when I was called upon to take views of rapidly moving animals. Other photographers had tried to get views of these animals, but the result, compared to the great quantity of plates spoiled, time and labour lost, was by no means encouraging. My own apparatus was not ready, and I consequently had to work with an outfit perfectly strange to me, and which furthermore had the great inconvenience of a rack and pinion movement, paper dry plate holders, and a lens without any depth of focus. The result of twelve plates was eight plates light struck, one plate a blur, and three pretty sharp negatives, which, however, showed the animals rather small. After this experience I rigged my apparatus, constructed a drop shutter moving upwards by means of a pretty powerful spring, and the result was, of eleven plates I got nine good ones. The animals, horses, riders, &c., were all taken whilst moving at full speed, some at 100, others 60, and others 35, and even only at 8 feet distance, and under these circumstances it was that the sliding motion of the camera and the focussing marks proved to be the desideratum.

The question was to take shots at those rapidly moving animals whilst they offered the most striking poses, and the changing of plates had to be done in a great hurry in order to be ready as soon as possible to take another shot. The camera, as soon as the slide was drawn, was shouldered, the right hand holding the bulb of the release and governing the back of the camera to bring it to the corresponding focus—and piff! take the shot. I had to work in this style, which, of course, is open to many an objection. If I could have had my way, I would have proceeded as follows:—I would have adopted Mr. Anschütz's *modus operandi*; i.e., I would have measured out upon the track which those moving animals had to run over, certain distances, placing chalk in powder or whitewashed stones at the corresponding places, and with the camera ready would have taken only such shots for which preparations as mentioned had been made, that is, releasing the shutter the very moment that



the moving objects passed the corresponding spot. As the performance was repeated every afternoon in the same order, I would have divided the shots to be taken in accordance with these features, which I had observed, and in this way the work would have been not only much easier, but also have given better results. It is in this way that Anschütz has succeeded in securing those splendid scenes of the cavalry manoeuvres, which are admired by everybody.

Now a word about the development of instantaneously exposed plates. The best plan is to give the plates before development a preliminary bath of carbonate of soda  $\frac{1}{2}$  and carbonate of potash  $\frac{1}{4}$ , at the strength of 5 per cent., and for at least two minutes, and without washing place them in the developing tray and start development with a rather diluted developer containing a greater proportion of pyro than alkali. As the development will be slow some patience is required, and a cover for the tray should not be forgotten, for if the plate is not to be covered it might get light-stuck whilst exposed to the lamp and the development going on. When the details are pretty well out, a larger quantity of pyro may be applied in order to bring out density.

Some plates stand more bromide than others, but all instantaneously exposed plates require a good dose of bromide of brains, and I sincerely advise everybody to use this stuff as freely as possible, and if combined with a good dose of bromide of patience, so much the better for him and his work.—*Anthony's Bulletin.*

## Patent Intelligence.

### Applications for Letters Patent.

- 14,545. HENRY HERBERT, 76, Chancery Lane, W.C., for "A New or Improved Construction of Shutter for Photographic Apparatus."—October 10th, 1888.
- 14,546. HENRY HERBERT, 76, Chancery Lane, W.C., for "Improvements in Apparatus for Changing and successively Exposing the Plates used in the Process of Photography."—October 10th, 1888.
- 14,567. HENRY RINGWOOD, 64, Spey Street, St. Leonard's Road, Poplar, E., for "Stands or Holders for the Frames of Photographs, Tablets, Cards, and such like articles."—October 10th, 1888.

Patent on which the Fourth Year's Renewal Fee has been Paid.

- 13,156 of 1884. J. W. T. CADETT.—Photographic Shutters.

### Specifications Published during the Week.

- 11,985. AUGUSTUS GEORGE VERNON HARCOURT, Cowly Grange, Oxford, in the County of Oxford, Gentleman, for "An Improved Standard Oil Lamp for Use in Photometry."—Dated 3rd September, 1887.

My invention relates to improvements in oil lamps, whereby a definite and regulated amount of light may be obtained, so as to be conveniently used as a standard for measuring other lights.

My lamp is constructed as follows. I provide a vessel—which may conveniently be of glass, and of the form and dimensions of an ordinary spirit lamp—to contain the oil or liquid with which it is fed, and which may conveniently be "Pentane," obtained by purification and repeated rectification from American petroleum. This liquid is so volatile that it is converted into gas within the burner, the wick serving only to bring the liquid to a part of the tube where the heat is sufficient to cause it to evaporate at the required rate.

In order that my invention may be the better understood, I now proceed to describe the same in relation to the drawings hereunto annexed, reference being had to the letters and figures marked thereon.

Figure 1 represents a sectional front view of the lamp.

Figure 2 represents a side view of the lamp.

Figure 3 represents a plan of the lamp.

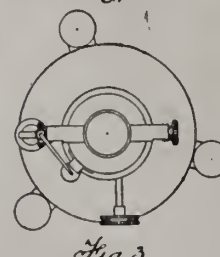
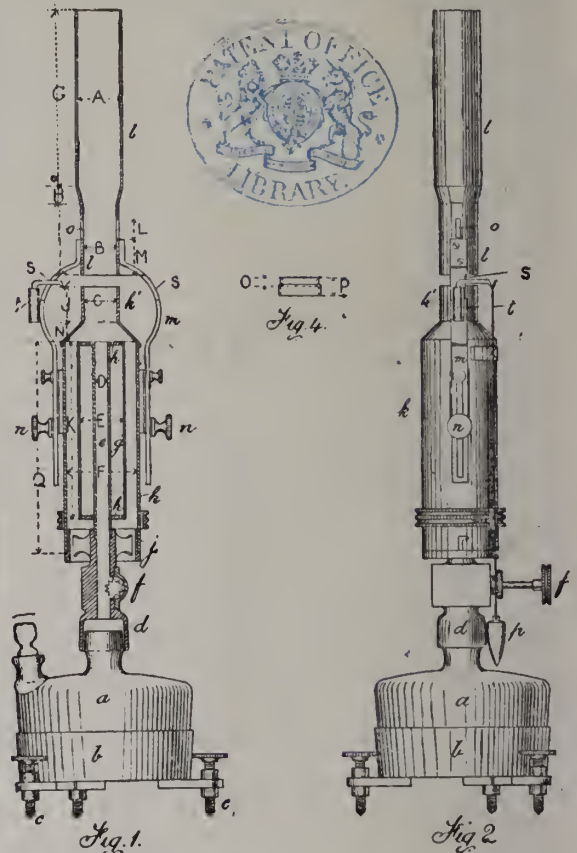
Figure 4 represents the small collar which is to be used when the half candle gauge is employed. The collar is slipped over the small tube surrounding the lower part of the flame, and the measurement with the gauge is to be made from the upper edge of this collar.

I mount a glass vessel *a* upon a stand *b*, provided with levelling screws *c*. To the vessel is fitted a cap *d*, surmounted by a tube *e*, in which a wick is wound up and down by the

ordinary arrangement of a double spiked wheel *f* turned by a handle.

Around the upper part of this tube, whose diameter may be about a quarter of an inch and its length six or seven inches, is a second tube *g* of about one inch in diameter and four inches in length, which serves as a jacket to keep more constant the temperature of the inner tube, and to guide the air current upon which the steadiness and brightness of the flame depend. The two tubes are joined by flat pieces *h* above and below, and constitute the burner of the lamp.

Attached to the inner tube by branches is a gallery *j* carrying



### DIMENSIONS

A	25 MM
B	25
C	20
D	7
E	25
F	40
G	100
H	10
I	40
J	20
K	100
L	5
M	10
N	10
O	3.5
P	10
Q	20

a metal chimney *k*, which surrounds both the burner and the lower part of the frame. Above the burner the part *k'* of this chimney is reduced to a diameter intermediate between that of the aforesaid outer tube *g* and inner tube *e* of the burner, and terminates at a short distance above the burner. The upper part of the flame is again enclosed by a continuation *l* of this metal chimney, which is of the same diameter as the lower part, but is enlarged in diameter towards its upper end.

This upper portion of the chimney is connected with the lower



chimney by curved metal bands *m*, conveniently two in number, and sufficiently removed from the flame on either side as not to affect it.

Through the space thus left between the upper and lower metal chimneys, the central part of the long flame which the burner produces is alone visible.

The attachment of these bands connecting the upper to the lower chimney is adjustable by set screws *n*, so that the opening through which the central part of the flame is seen may be made longer or smaller as desired.

By simple means, such as an adjustment screw, or preferably by means of cylindrical gauges of the same diameter as the tubes which they separate, this opening can be set quickly and accurately to such sizes as will give exactly the light of half a candle, one candle, one and a half candles, or values intermediate between these as desired.

At opposite sides of the lower part of the upper chimney are two narrow slots *o*, through either of which the tip of the flame may be seen; and the construction of the lamp is such that the light emitted through the opening between the two chimneys is the same whenever the tip of the flame appears opposite the slot, whether towards the lower or the upper end.

The bands *m* connecting the two chimneys are of half the width of the tube that surrounds the flame. When the lamp is vertical, so that these bands are in a plane perpendicular to the horizontal bar of the photometer, a point in the plane containing the edges of the bands nearest to the photometric disc, midway between these edges, and at the height of the centre of the aperture through which the luminous flame is visible, is to be taken as that from which distances are to be measured. This point represents the zero of the usual photometric scale.

In order to easily obtain the plane in which this point lies, two slots *s* are cut in the bands *m* on the side nearest the disc, and into these slots a flat piece of metal fits of the same thickness as the depth of the slots; the point from which distances are measured lies on the surface of this piece nearest to the disc.

Suitable attachments are provided for carrying a plumb line *p* to serve in setting the lamp vertical, and for carrying a small piece of coloured glass fitting in the plumb line socket *t*, so as to stand opposite to the slot *o*. By reflection from or direct vision through this glass, it may easily be observed whether the tip of the flame is within the slot or not.

The height of gauges which I find produce, when burning "Pentane," a light equivalent to a-half, one, or one and a-half standard English parliamentary candles, is, respectively,  $7\frac{1}{2}$ , 16, 27.5 mm.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. The construction of a lamp to enable it to burn a highly volatile combustible liquid, producing a constant light, substantially as and for the purposes described.

2. In such a lamp, the combination of a jacketed supply tube with one or more concentric tubes with intervening air spaces to produce the following effects: (a) A distribution of temperature along the tube containing the wick, causing any desired constant height of flame to be produced by raising or lowering the wick; (b) A steady and bright flame, owing to its being situated in the axis of a uniform and rapid current of warm air.

3. The construction and combination of parts in a lamp to enable unmixed pentane vapour to be burnt without charring the wick in normal use, and so as to produce a uniform standard light, substantially as described.

Patents stated in the Official Journal to have become Void by Non-payment of Duty. Non-payment of Fourth Year's Fee.

9,612 of 1884. A. G. BROOKES. (*Hunkler and another.*)—Photographic Plates.

## Correspondence.

### STANDARD LIGHT.

DEAR SIR,—Since reading the article in the PHOTOGRAPHIC NEWS of September 21, on "Report of Committee on a Standard Light," I have been impressed with the idea that magnesium might in some way be used to furnish a standard.

I am not aware that it has ever been tried, and pro-

viding certain difficulties can be overcome, I should think a constant light could be obtained. As we know, the proportional quantities of magnesium and oxygen which combine are always the same. It follows that the effect of the combination must be constant, and the light being the effect, the amount must likewise be constant.

Wire or ribbon of given dimensions might be used, or a given weight of the powder mixed with suitable substance for explosion might do. In either case purity of material would be a necessity, and in the former, accuracy in dimensions and density. If these difficulties could be met, I should think magnesium might answer.

EDGAR J. WRIGHT.

421, First Street, Brooklyn, N.Y., October 5, 1888.

### PHOTOGRAPHS OF LIGHTNING FLASHES.

DEAR SIR,—A great share of the attention with which photographs of lightning flashes are now regarded is due to the way in which your journal has from time to time drawn attention to the subject—published photographs, and in other ways drawn attention to the importance of the subject. Your comments on the deficiencies in the Royal Meteorological Society's circular on the subject, and the persistent way in which you have advocated the importance of full information accompanying the photographs, make me venture to hope that this communication may be of some interest to yourself and your readers.

During a thunderstorm here on the evening of July 30 I made a few experiments, and your reprint of the Thunderstorm Committee's report reaching me a few weeks later, I recently read a paper on the subject at the South African Philosophical Society. The proceedings of our Society will not be published for a few months, but the following is a brief abstract of my remarks.

I gave an epitome of the report, with the committee's opinion that "lightning tends to assume various forms under conditions at present unknown"; that the principal forms were stream, sinuous, ramified, and meandering; that the beaded and ribbon forms were explained by the committee in a manner with which I perfectly agreed. I further drew attention to certain appearances in some of the photographs, for which the committee could find no explanation.

I then exhibited photographs published in the News, also some photos. taken in this colony by Messrs. Allis, Hawksworth, and myself. My own photographs, I pointed out, could not be called, exclusively, either sinuous, ramified, or meandering, but partook of the characters of all three, and were beaded in addition, as well as ribbon-like near the margin of the plate—an optical defect. At the time they were taken no part of the sky was absolutely free from cloud, and I particularly pointed out that my observations at the time convinced me they were only parts of flashes, and were modified in form by obstruction by cloud. This modification by cloud, I pointed out, in obstructing some parts of the flash and in thinning others, would explain in a simple manner one of the appearances which the committee had been unable to account for. Might not this modification by cloud be also able to account for some of the various forms which the lightning assumed?

Drawing attention to some photographs of the electric spark taken by Mr. Trueman Wood and others, I pointed out that in the single spark we had the representative of the stream lightning, and by covering portions of a photo. of a series of sparks we could obtain the other forms classed by the committee. The physical conditions of earth and cloud during a thunderstorm would permit of a series of simultaneous, or almost simultaneous, sparks passing, of which one would be much stronger than the rest. Further, there was sufficient evidence already on record, apart from my own observations and the more conclusive testimony of Mr. Allis's photograph, that what appeared as one instantaneous discharge consisted of a series of sparks passing in a very appreciable space of time, at least as much as one-tenth of a second.



The conclusion of my paper I will ask you to reprint verbatim.

"To sum up. It appears probable, then, that so far from lightning assuming various forms under conditions at present unknown, it only assumes two forms, such as may be obtained in the laboratory—the single spark, and the compound flash, or series of sparks, the various forms of the latter being due to modification in appearance by the obstruction of cloud masses.

"Bearing in mind that the former view is put forward by one of our best living representatives of meteorological science, I put forward a contrary view with all due diffidence; but in apology for my presumption, I lay stress on the fact that my own view is based on photographs taken by myself, coupled with personal observation of the condition of sky at the time; whereas, the view taken in the Meteorological Society's Report is based on an examination of photographs taken by others. In their circular the Committee of the Meteorological Society only asked for photographs. Had they ventured to ask photographers for particulars, were it only a general description of the sky, though they might have found fewer correspondents to communicate with them, I venture to think that the Committee would have adopted views similar to my own."

Two or three nights ago I had another opportunity of making investigations. I obtained some good photographs of flashes of the ramified and sinuous forms, with unmistakable indications of their modification by cloud. One flash, which does not appear on my plates, it being out of the field of view, was noticed by several observers as consisting of a series of sparks in the same path, the whole taking up over a second of time. When the next thunderstorm occurs here I hope to take photographs and obtain observations on a somewhat extensive scale.

Thanking you in advance for allowing me to trespass so much on your space, I am Sir, yours respectfully,

C. RAY WOODS.

*Royal Observatory, Cape of Good Hope, Sept. 25th, 1888.*

#### ORTHOCHROMATIC PHOTOGRAPHY.

DEAR SIR,—In answer to Mr. Driffield's letter in your issue of October 12th, we beg to explain that there is nothing peculiar about the blue of the model which we use, except that the colours are perfectly matt or dead surface, so as to reflect little or no white light, which the leaves and petals of some flowers reflect to a very large extent. Also Mr. Driffield's first experiments were probably made with some of our exceedingly rapid isochromatic plates, which naturally are less likely to show such marked contrast between the blue and yellow rays as those of medium rapidity, such as we recommend for copying paintings and photographing coloured objects generally. We enclose one of our isochromatic models, with print from negative taken on one of these plates without a coloured screen, and a companion print from a negative taken on an ordinary plate; we also enclose copies of negatives of a group of flowers taken in the same way.—Yours truly,

B. J. EDWARDS & Co.

*The Grove, Hackney, October 15th.*

[We regard the blue of the "isochromatic model" sent by our correspondents rather as what is generally called a "blue-black," than as "blue" without any qualification; in other words, we do not regard it as a fair sample of blue.—ED. P.N.]

### Proceedings of Societies.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE usual weekly meeting was held on the 11th inst., A. HADDON in the chair.

J. J. BRIGINSIAW exhibited two negatives, the films of which were covered with pits, which had been caused by slowness in drying. He usually dried his plates in a rack; in the present

case, they had been placed too close together, causing them to be completely spoiled.

The CHAIRMAN said a similar result would be observable on the face of gelatine that had been soaked and dissolved and left in a beaker.

A question from the box asked whether rapidity of drying influenced the sensitiveness of a gelatine plate?

P. EVERITT had found that plates rapidly dried had a greater tendency to frill.

W. COBB was not of this opinion.

The CHAIRMAN said many amateurs had resorted to the use of chloride of calcium for drying plates. It was well known that as soon as the surface of the calcium was moistened, its action became slower. Some years ago he devised an apparatus which rectified this; it consisted of a tin funnel pierced with holes, in which the chloride of calcium was placed. The water, as it accumulated, ran out of the holes in the vessel into a dish. The surface of the chloride of calcium was thus kept free from accumulated moisture.

R. H. HAMSER asked if sulphuric acid would not be as effective for the purpose of drying plates.

The CHAIRMAN said the action would be the same. Diffusion of collected moisture, after the surface of the sulphuric acid had been covered, would be slow.

A Member said, in filtering emulsion through wash-leather, he found that, after a few times using, it was difficult to get the emulsion through the leather.

The CHAIRMAN attributed this to patches of bromide attaching to the wash-leather. He thought this might be remedied by dissolving the bromide out with hypo, of course thoroughly washing the leather afterwards.

E. B. Lawford was elected a member of the Association.

#### IPSWICH PHOTOGRAPHIC SOCIETY.

THE monthly meeting of this Society was held at the Art Gallery, High Street, Ipswich, on Tuesday evening, the 9th inst., and, being the first meeting after the summer recess, was devoted to exhibiting the results of the summer excursions. The President (J. DIXON PIPER) was in the chair, and there was a good muster of members. A suggestion that the Fine Art Club should be approached with the view of obtaining permission to have a screen of photographs taken by the members of the Photographic Society at the annual exhibition held by local artists about January, met with much approval, and the President was deputed to consult with the committee of the Fine Art Club.

At the November meeting of the Society, A. H. Cade will give a demonstration of carbon printing and developing.

On December 11th there will be an exhibition of photographic transparencies through the optical lantern, when members are invited to make transparencies of the standard size (3½ by 3½).

The annual meeting will be held on January 8th, 1889.

#### NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

THE ordinary monthly meeting was held in the Mosley Street Café, Newcastle, on the 9th inst., T. GALLOWAY in the chair.

A paper by J. B. PAYNE was read, entitled, "A Note on Hydroquinone Development, with Illustrations" (see page 666).

#### BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE ordinary meeting was held in the Technical Schools, Bridge Street, on the 11th inst., C. J. FOWLER in the chair.

J. Frankliu Pike was elected a member.

Exhibits of prints on Obernetter paper and "celluloid" were shown by S. G. MASON; also enlargements from half-plate, by J. H. PICKARD.

The prize for best picture taken on July excursions was presented to the winner, W. J. HARRISON—the prize being a fine enlargement by Morgan and Kidd of the winning negative.

The question-box contained:—"Can anyone recommend the tungstate toning bath for Scholzig paper?"

J. H. PICKARD: Yes, it gives very good tones, and always use bath and washing waters slightly warm; this prevents frilling. In comparing the formula of Beach's potash developer with that of the American standard developer, I find four grains of pyro contained in one ounce of the former, and only half that quantity in an ounce of the American developer. What explanation can be given for the difference?

A. PUMPHREY then gave a short paper on "A Modification of



the Method of Lifting Gelatine Negatives" (see page 663), and practically demonstrated the process, stripping several, and showing a number of stripped negatives, which were of very good quality. The process showed much promise of usefulness, and was much commented upon.

E. C. MIDDLETON then gave his paper on "Hints." His paper contained many varied and practical ideas, and embraced a large area of subjects connected with amateur photography.

#### BIRKENHEAD PHOTOGRAPHIC ASSOCIATION.

THE ordinary meeting was held on the 11th inst., at the Free Public Library, J. H. DAY in the chair.

Specimens of the new sepia-type paper were exhibited in a number of brilliant prints; its peculiar tones of sienna red were thought, however, more uncommon than artistic, though for certain classes of work it would, doubtless, have its advantages, one very important one being the extreme simplicity with which it can be manipulated.

J. A. FORREST exhibited an album of prints taken during the annual excursion of the Liverpool Guardian Society this season, which included views taken in Harrogate, Knaresborough, Fountains Abbey, &c.

Prints taken during the Association's outing to the Upper Dee, on the 17th ult., were handed round. Mr. Collinge, of Chester, having placed his lunch at the disposal of the Association, some fourteen members took advantage of his kindness, and, embarking in the morning, steamed as far as Farndon. Permission having been obtained from the Duke of Westminster to photograph about Eaton Hall, it was visited *en route*, and considerable advantage taken of the opportunity, resulting in some good work being produced.

F. N. EATON gave an interesting demonstration of transparency making by the wet collodion process, facility with which a first-class slide was produced exciting some wonder; the various operations of toning, clearing, &c., were followed with much interest. The odour of the collodion having, seemingly, a revivifying effect on the memory, several of the older members were beguiled by its influence into reminiscences of a period *ante* the introduction of gelatine plates by many years.

It was decided to hold a lantern slide competition for the Association's medals at the December meeting.

#### DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

THE first meeting of the session was held in Lamb's Hotel, Dundee, on the 4th instant, Mr. ROBERTSON in the chair.

William Bertie was elected a member, and six gentlemen were nominated for election at the November meeting.

THE PRESIDENT, in his opening address, hoped that, supported by the Council, he would be able to keep the Association up to its former status, and, if possible, make the meetings more attractive than in the past. He then gave a short sketch of how he thought this might be done. Elaborate and learned papers were not required, but rather one's dealing with some of the common events of every-day practice, such as on developing, developers, the different printing papers, toning, and, though last, far from being least, the art side of photography, and not to forget the question-box. In conclusion, he said, there is just one other matter I wish to notice, and this I do both with regret and congratulation; I refer to the loss our Association will sustain by the removal of our Honorary President, Professor Carnelly, of the Dundee College, from amongst us. But, while regretting the loss of one we highly esteem, we will none the less accord him our warmest congratulations on his appointment to a Professor's chair in Aberdeen University, and wish him every success and happiness in his new sphere of labour.

J. ROBERTSON then read a paper entitled "The Dry Plate," giving his experiences of the different plates used since the days of wet collodion.

The following query was found in the question-box:—"In toning with borax, say, five sheets of paper at a time, has any one noticed a falling off in the last prints, the bath being at first made up for three sheets of paper, and strengthened with gold as the toning went on? If so, the cause."

The inquirer was recommended to make up the bath for the five sheets of paper at first.

#### DEVON AND CORNWALL CAMERA CLUB.

A LARGE number of amateur photographers—both ladies and gentlemen—met on Saturday afternoon last at the Royal Hotel, Plymouth, for the purpose of considering the possibility of forming an Amateur Photographic Society for the district. Amongst

those present were Commander H. M. Tudor Jones, Captain W. F. Castle, R.N., Lieut.-Col. G. Heseltine, Dr. Waterfield, Dr. Aldridge, Major Barrington Baker, Dr. Ellery, Messrs. J. Pote, Creagh, J. Soltan-Symon, R. Murray, W. G. Tweedy, J. S. Hawker, A. S. Carnell, C. B. Yonge, J. R. Huddy, and Miss Conran. J. POTE was voted to the chair.

Commander JONES, after expressing his pleasure at seeing so many present in answer to his circular, said he had been struck by reading reports of various photographic society meetings all over the kingdom, and was surprised that one had not been established in Plymouth. After some thought, he wrote to some well-known amateur photographers to obtain their views on the subject, and several expressing their willingness to form themselves into a society, he eventually obtained about thirty names. The object of the society would in various ways confer many benefits on its members. The advancement of photography itself would be their first aim. The meeting would give an opportunity for interchange of ideas, to hear lectures, demonstrations, discussions, exhibitions of photographic apparatus, and in many other ways make it generally interesting. The members might form themselves into sections for the development of their own favourite departments, and while limiting themselves to photography, endeavour to make the aim of the club as catholic as possible. He would mention that two talented gentlemen had readily consented to give lectures, and when he gave the names of Mr. Carnell and Mr. Tweedy he was sure they might expect something interesting. It was most important, he thought, that a young club should have a dark-room, but a larger room in which to hold their meetings was still more necessary. He concluded by moving the formation of an amateur photographic society.

This was carried, and the meeting then proceeded to make the first two rules and appoint a committee to complete the list by the next meeting. It was decided to call the society "The Devon and Cornwall Camera Club," having for its object the advancement of the science and art of photography, as well as the recreation and mutual improvement of its members on that subject. The following committee were then nominated, with power to add to their number, to draw up the rules and lay before the adjourned meeting:—Mr. Tweedy, Commander Jones, Mr. Carnell, Dr. Aldridge, Mr. Murray, Major Barrington Baker, and the chairman.

The meeting was then adjourned for a fortnight, to be held in the same place at four o'clock.

#### CAMERA CLUB.

THE Camera Club, having opened the new winter session with the usual monthly smoking concert on Monday, October 8th, commenced the more serious part of its functions by a technical meeting on Thursday the 11th. These "Thursday evenings" will be continued as in previous sessions. The subject treated at this first meeting was "Printing-out Platina Paper, and a Comparison of Platinotype Processes," the lecture being given by F. de Paula Cembrano. The chair was occupied by T. Charters White. Objects of interest were handed round previous to the reading of the paper.

C. CEMBRANO, in treating his subject, commenced by a general description of the Platinotype process, and gave an outline of each of the methods now introduced. He had conducted a very extensive set of experiments to compare the results obtained from different preparations of the printing-out paper, and also from the ordinary hot process, and the new cold-bath process. For this purpose he had employed consistently eight negatives. These, and a very large number of prints from them, mounted upon cards in sets, for convenience of comparison, were handed round. In regard to the cold-bath process, he found it gave very brilliant prints, with less softness, perhaps, than the hot process, but with very vigorous blacks. He thought it would be specially serviceable for the reproduction of engravings where a powerful black was required. He had not found himself able to control the development as he had seen done by Mr. Willis.

In reference to the Pizzighelli paper, he had first used the commercial paper, but had found it fail somewhat in giving detail in deep shadows. Mr. Cembrano then sensitised a sheet of paper with a modification of the Pizzighelli formula, and handed round sets of prints showing the results obtained by various formulae he had employed. These formulae were given in the lecture, one of them including the addition of chloride of calcium to the sensitiser.

In the discussion, Mr. WELLINGTON said he had experimented upon No. 3 formula as given by Pizzighelli, making variations



in it. The conclusion he had arrived at was that the best results were obtained when he added sugar to the gum used in preparing the paper. Some excellent examples of this method of preparation were shown. He was glad to see that Mr. Cembrano had shown good prints upon paper prepared with chloride of calcium in the sensitiser. It had occurred to him that a hygroscopic substance mixed in the sensitiser might prove beneficial.

Mr. GUARDIA thought gum gave a granular appearance. He preferred sized paper. He did not think the printing-out paper often gave the results of the old process; in fact, he inclined to think no process did.

Mr. STROH could never get Pizzighelli paper twice alike. One set would give excellent results, the next batch streaky, and not at all black. If different kinds were manufactured, then they ought to be distinguished by the vendors as A, B, and so on. If it could be made perfect, it would be a lovely process. He had found it rather useful for panorama subjects, where the printing of the separate sections of the picture had to be of the same depth. Contrary to what was generally stated, he pointed out that the paper did really print, although perfectly dry. The colour given was different to where it had absorbed moisture. Several examples were shown by Mr. Stroh to illustrate his remarks.

Mr. COWAN found he obtained a very vigorous print with the commercial paper.

LYONEL CLARK gave the results of an extensive set of experiments he had conducted upon the different process papers with the sensitometer, and showed the curves obtained thereby; the general conclusion arrived at being that the Pizzighelli method of preparation gave the least range, and the new cold bath process the greatest. To get a decent print from Pizzighelli paper, he stated that a very dense, hard negative must be used.

Mr. RODGERS had obtained good results with thin negatives, and had found much advantage accrue from the use of old acid baths. There was more detail in the shadows, he considered, than with the hot process.

Mr. DAVISON was afraid a velvety black could never be obtained upon the printing-out paper. He had found it give good prints from thin negatives if the paper were dry and new, although the colour was not black. It could only be allowable to breathe on the paper for printing from very hard negatives. He showed some examples of solarization on the paper, where a burnt-up appearance was the result. He had not found, as stated, that there was any reduction of the density of the negatives where breathed-on paper had been long in contact with the film. Of all the processes he had tried, he preferred the new cold bath process. The image was on the surface of the paper instead of being sunk in the paper, and, consequently, greater brilliancy and detail were given. There was very little difficulty in judging the printing, which was quicker. The point he felt of the most importance was that a brilliant and a half-tone paper could be supplied, one suited to thin and the other to denser negatives. The developer should not be too dilute, or granularity appeared to result. The great objection, he felt, which would be raised against the process was the cost, unless some means could be devised of economising in the use of the developer.

Mr. WILLIS said he rather preferred to listen to the opinions of others in regard to any new process than to express his own. He might say that wherever the image was printed out in the old platinum process (the hot process), the result was inferior to that in which it was developed out. Further, after printing to a certain depth, the platinum deposit was so opaque in printing-out methods that the action of light in the shadows soon ceased. In regard to printing-in clouds in platinum, he gave the experience of a good worker, that it was best to print the clouds in before the landscape, as there was less risk of fogging the horizon line. Referring to the cold-bath process, he stated that warmer tones could be obtained by exposing for half-an-hour to the atmosphere.

Mr. CEMBRANO having replied, the Chairman closed the discussion.

In illustration of the subject of the evening, an interesting set of pictures by Mr. Seyton Scott was shown, in which all the processes were well compared, and the variation in colour obtainable on Pizzighelli paper exemplified. Some fine prints lent by Mr. Rudowski were also exhibited.

The subject for discussion on Thursday, October 25th, will be "Printing Density of Negatives," the lecturer being Mr. Lionel Clark. Meeting to commence at 8.0 p.m.

## Talk in the Studio.

**DETERMINATION OF ALCOHOL.** By B. ROSE (*Zeit. angewand. Chem.*, 1, 31—35).—An excess of potassium permanganate oxidizes alcohol completely to carbonic acid and water, when to the mixture so much concentrated sulphuric acid is added that it amounts to 40 per cent. of the whole. The author's experiments were made with absolute alcohol distilled from quicklime in an apparatus from which moist air was excluded. It boiled at 78.26° (corr.). From this a 1 per cent. solution was made with purified water. The permanganate solution contained 10 grams in a litre, and was standardized by potassium quadroxalate, a decinormal solution of which is also required. The analytical process is as follows:—About 5 grams of the dilute alcohol is weighed in a flask; 50 c.c. of the permanganate is run in, and then 20 c.c. of sulphuric acid whilst shaking. After a few minutes 100 c.c. of water is added, then a measured excess of the oxalate, the liquid heated nearly to boiling, and the excess of the oxalate found by permanganate. In four experiments, 100.18, 100.0, 100.24, and 100.0 per cent. of the alcohol present was indicated.—*Journal of the Chemical Society.*

**PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.**—The next technical meeting will take place on Tuesday, October 23rd, at 8 p.m. at 5A, Pall Mall East, when the apparatus on view at the exhibition will be explained.

**YORK'S CATALOGUE OF LANTERN SLIDES.**—We have here a catalogue of several thousand lantern slides affording a choice likely to suit lecturers on almost all subjects. It is issued by York and Son, of 86, Lancaster Road, Notting Hill.

**PHOTOGRAPHIC CLUB.**—The subject for discussion on Oct. 24th will be "Electric Lighting of the Studio;" paper by F. Haes. Notices for nomination of officers for the ensuing year and alteration of rules take place on this night.

## To Correspondents.

\* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER AND CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

A. T. EVANS.—Proofs of articles are sent out in the ordinary course, but if you require a personal engagement from the Editor that he will send you a proof, you had better not send the article.

SOUTHAMPTON.—If our correspondent from this town will forward full name and address, we will send papers containing the best information on the subject.

F. T. BEESON.—Thank you for the communication.

H. H. SELWYN.—Although we are always willing to give such particulars when we have them to hand, we cannot undertake to search the files. You can do this for yourself at the Patent Office Library in Southampton Buildings, Chancery Lane.

ALEX. M. MARRISON.—1. It is quite impossible for us to tell you the composition of the sample of printing ink by inspecting it. 2. The process is a thoroughly reliable one.

J. T. and S.—You had better write to Atkinson and Co., of Liverpool.

J. WATTS.—It has already been noticed in the PHOTOGRAPHIC NEWS.

H. M. MASTER.—Judging from our experience, we should say No. 1 or No. 2. Between these there is nothing to choose.

ENQUIRER.—You are not legally liable unless the photograph was registered.

CARLO.—Full details were published at the time you refer to, but nothing important has been published since. Perhaps you had better write to the gentleman to whom you refer. His address will be found in the list of members issued by the Photographic Society of Great Britain.

G. A. U.—Probably the best way will be to dab them over with a mixture of starch-paste and lamp-black. A soft sponge is convenient for applying the mixture. Blacklead mixed with water, applied with a brush, and allowed to dry spontaneously, also gives a good surface for photographing, but this is so liable to polish by gentle friction that it is difficult to handle the articles without causing bright patches.

A. PUMPHREY.—Thank you for your note and the paper. The enclosure intended for the publishers has been handed to them.

R. T. CARRUTHERS.—The addition of about six drops of pure phenol (carbolic acid) to each ounce will certainly prevent what you complain of, and we do not think any mischief will result from making this addition.



# THE PHOTOGRAPHIC NEWS.



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## INJURIOUS MOUNTING BOARDS, AND HOW TO TEST THEM.

FEW injuries inflicted upon the photographer are more disastrous to him from a business point of view than the injuries inflicted by those who, either from carelessness or out of commercialist greed, supply mounts which contain destructive or damaging material which, in so many cases, only manifests itself when the mounted photographs have been sent out to customers, and are beyond the recall of the photographer.

We propose, in the present article, to give simple instructions, by following which the practitioner may generally guard against serious loss of reputation by the use of the injurious mounts now so largely in the hands of dealers, and coming, for the most part, from Germany. Indeed, so serious has the question of bad paper material become in Germany, that an imperial commission upon the subject has been instituted, and this commission has very heartily condemned the German commercial papers of the time as practically worthless for permanent documental use; and the result is the establishment of a paper-testing institution at Charlottenburgh, where all papers intended for Government use are to be tested. The badness of the commercial papers tested depends partly on the use of unsuitable fibre, and partly on the imperfect removal of the chemicals used in the preparation of the fibre.

From a photographic point of view the imperfect removal of chemicals is, perhaps, the most important one, as unsuitable fibre, if properly cleaned and freed from chemicals, may be poor in quality from the point of view taken by an official examiner of paper, and yet be suitable enough for making photographic mounts when no great strength of the cardboard is required. On the other hand, a fibre of good quality, if imperfectly freed from hyposulphite, for example, may be reasonably good from the point of view of the ordinary paper examiner, but rapidly fatal to silver prints mounted upon it.

Still, as a very frequent thing, low quality of fibre and imperfect removal of the chemicals go together; and although some excellent mounts of German make are in the market, the fact remains that, at present, the average standard of the quality of the German mounts is a very low one, while some sold are so bad, both as regards the fibre and the non-removal of chemicals, as to be alike a disgrace to manufacturer and vendor.

A new source of mischief in connection with photographic mounts has been brought into comparative prominence recently: that of the use of an enamel easily softened by water, and containing soluble colouring or other matter, which readily passes into the photographs and injures them. In our issue of July 6th last, we referred to such mounts in the following paragraph:—"We have had complaints of a new kind of deleterious mount. It is of

a dark chocolate colour, and contains a soluble red colouring matter, which permeates the print more or less rapidly according to the softness of the paper and the amount of moisture used in mounting. These mounts may be recognised by soaking in water, and then leaving under pressure with white paper on each side." As we intimated in the above paragraph, mounts containing soluble colouring matter in the enamel can easily be recognised by being made moist, and pressing between white blotting paper, when the colour sets off on the blotting paper. To perform the test, perhaps the best method is to dip a piece of the mount for a few seconds in warm water, and then lay it between sheets of wet blotting paper for an hour or so, a moderate weight being used to keep all in contact. Some samples of mount we have met with are so bad, that the soluble colouring matter streams out when the test sample is first put in the warm water, and, in this case, it is of course superfluous to apply any further test.

The injurious effect of the mounts containing soluble colouring matter is most immediately manifest in the case of prints on soft paper, such as salted paper; next to which we may range platinotype and matt bromide paper; and last of all albumenized paper; while in every instance the mischief is much enhanced by the continued presence of moisture.

From time to time we have given particulars as to chemical methods of testing mounting boards for the more commonly occurring chemical impurities, but to obtain certain and definite results involves a skill in chemical manipulation which many photographers do not possess. In addition, it is to be remembered that there are so many chemicals to be sought for, and there is such a constant liability of fresh chemicals being imported into the paper manufacture, that even when a chemist has proved the absence of chemicals generally recognised as common impurities, it does not by any means follow that the mounts are harmless.

Considering all this, we again recommend a course which we have several times recommended—the mounting of trial pieces upon the various samples of cardboard to be examined, and the exposure of the samples to air and moisture. When this sort of test is carefully made it often happens that an indication of special badness in the mounts is obtained in the course of a few days, while in almost all cases of distinctly bad cardboard there is an obvious indication in a fortnight.

With respect to the actual method of performing the test we may recommend the following:—

First procure as a standard, a mounting board known to be of good quality—a matter quite easy in an old-established studio—where batches of mounts have been used and found satisfactory. An old mounted print which has not faded is often useful, as one must assume the mount to be good, and the back is generally available



for experiment. In the standard mount, punch with a gun-wad punch, as many holes as there are new mounts to be tested, and in each of the holes lay a corresponding disc punched from one of the mounts to be tested, and then mount an ordinary silver print over the whole. The print mounted on the composite card is now left in a damp place and observed from time to time. In order that any slight fading or discolouration may be easily recognizable, the print should not be too vigorous; indeed, it is worth while to make a special negative consisting of stripes graduated from a middle tint downwards.

Near a window, in a damp cellar, is a very good place for keeping the trial print, but inside a window fern case is, perhaps, better.

### COLD WEATHER DIFFICULTIES.

AMONGST the lessons which experience has taught the veteran photographer, is the one that conditions affecting the character of the work, different from those in force at other times, come into operation with the arrival of the colder season of the year. One gets, however, so much into a routine method of proceeding, and habit of expecting the same result to arrive from the employment of the same materials, that after a continuance for months of a tolerably regular style of work, even practised hands will sometimes find themselves surprised by observing a something wanting, a difference in the result which is achieved from that which was desired and anticipated; whilst those whose experience is more limited may find themselves at a loss, and often endeavour to account for the unwonted difference of result by a supposed inferiority in the plates, or in some of the chemicals they may happen to have in use at the time. It is therefore desirable to sound a note of warning which our own experience has shown to be occasionally needed even by old practitioners, and which newer ones will naturally find useful.

The effect of temperature as an element in the action of the developing solution is perhaps the most striking instance of the different conditions which cold weather introduces into the conduct of the photographer's operations. No doubt there are dark rooms which are so thoroughly warmed that the plate, solutions, and even water supply, are kept at an equable temperature during the colder portion of the year; but such dark rooms are by no means universal or even general, and unless the water supply is artificially warmed, the developer made up fresh from the tap will not be of the same temperature as that of the room itself, nor will the dishes just washed with very cold water be at anything like summer heat. If it is possible to ensure that the temperature of the water, as well as of plates and chemicals, shall be of moderate summer heat, no doubt that is the simplest and best way of securing uniformity of result, in so far as such uniformity does not depend upon variation of light, throughout the year. The difficulty, however, when recognised, may be intelligently met and combated in other ways.

Assuming that the pyro and ammonia developer, as that which is still in most general use in this country, is employed (and other methods of development will show similar if not identical differences of behaviour under varying condition of temperature), the thing that strikes the photographer on the first really cold morning of the season, is that the image comes up so slowly as to give the idea of being considerably under-exposed. If one fails to recognise the influence of lower temperature, and attributing the poverty of the image to insufficient exposure due to weak light, gives an increased exposure to make up for it, this increased exposure will give a weak image, which may also be set down to something belonging to the wintry light, and which, therefore, it is hopeless to combat. Remembering, however, the influence of temperature on the action of the developing solution, one may by the addition of a little more ammonia to make the solution act more energetically, and by allowing a

longer stay of the plate in the developer, obtain an image, perhaps, indistinguishable in brightness from that which one has been accustomed to in the summer. It must be remembered, however, that no light that is used in the developing room is entirely without effect upon the sensitive surface of the plate, and that therefore, if the development is prolonged, the picture may be somewhat fogged thereby, unless the dish containing the plate is covered or shielded from the light of the window or lamp. This is a precaution which, with highly sensitive plates, it is always desirable to take, and the absence of which has doubtless in some instances led the photographer to attribute to a wintry light some portion at least of weakness or foggiess which was really due to a prolonged exposure to the light from the dark room window.

Another trouble arising from cold weather is the presence in the studio of air containing a certain amount of mist or haziness, not perhaps strong enough to be called fog, but yet sufficient to dim the brightness of the image by interposing a light film over the shadows of the subject. Here, again, artificial warmth, which causes the partially condensed moisture to be absorbed by the air as invisible vapour, is the great remedy. When warmth cannot be abundantly supplied, or when the mistiness is due to a smoky atmosphere, the use of a tunnel, such as has been repeatedly recommended for town studios, will be found of considerable service, especially for full-length subjects or groups, in which cases the camera has to be removed a considerable distance from the sitter, and a proportionately longer space of illuminated atmosphere must be traversed by the rays of light proceeding from the subject to the lens.

An additional difficulty is sometimes experienced with the first sitters of a wintry day, from condensation of a little moisture upon the surfaces of the lens itself. If, as is sometimes the case, the lens is brought from a shelf or cupboard in a room without a fire, into a warmer studio, a dimness will commonly be perceived. This is objectionable, not only from the fact that this dimness must, until it is dispersed, involve a general fogging of the plate, but that by repeated condensation and evaporation the lens itself will become encrusted with dirt, and require frequent cleaning. If not cleaned, fogging to some extent again sets in; and if frequently rubbed, the surface is almost sure to become damaged by fine scratches, nearly almost imperceptible individually, but sufficient to impair the brightness and perfection of its surface as a whole. Lenses should therefore, when practicable, be kept, when not in use, in a place as free from cold and damp as is available.

We have in the present article touched only upon the effects of cold weather upon the operations connected with taking the negative, and upon those cases which are of most frequent and most annoying occurrence; the intelligent photographer, once aroused to their importance, will not fail to combat these effects when they present themselves in other forms.

### "ON STARTING IN BUSINESS."

BY C. BRANGWIN BARNES.

Most photographic assistants—be they operators, printers, or general assistants—cherish a hope that at some future time they will start in business for themselves, and perhaps employ a set of assistants themselves. The amount of capital required, and the locality wherein to commence business, are two of the main considerations to be taken into account at the outset, and the undue consideration of these two important items is a rock on which many a new-lunched barque strikes and founders. I have heard of photographers commencing business with literally no capital at all, except a very small stock of apparatus and accessories, added to a small credit at the dealers and an unlimited confidence in their own capabili-



ties of success, and in some few cases they have fought their way, perhaps not exactly to fortune, but to a fair standing, have managed to make a good living, and add to their business belongings; but for every one who has so far succeeded, there have been twenty who have made a fierce struggle for a few months, or perhaps for a year or two, and finally had to succumb to their ill fate, or rather, to their want of capital. On the other hand, there are many who have had a fair capital at the outset, but who, after a run of a year or so, have found themselves as badly off as those who started without. It must, however, be confessed that these latter are few and far between; for the old adage, that "money makes money," has been proved over and over again to be a true one; and where a man who started with a fair capital fails in the end, it is always a certainty that there has either been a gross lack of business ability, or there has been carelessness in the management, or incompetence to carry out the work he had set himself to do. Choice of locality has, in many instances, had its share towards the success or otherwise of the undertaking, while in others failure has partly been brought about by extensive opposition. What may have been a good and open locality at the time of opening a business, has often become a bad and cramped one owing to opposition afterwards.

Many a town will give a good living to one or two photographers, but because those one or two are there, and obtaining a good living, is not a sign that there is room for a third. Such an one starting a business in opposition to the one or two already established, not only takes away from their means of livelihood, but often severely handicaps himself at the same time. To find a town in the United Kingdom sufficiently large for a photographer, and where there is not one already, may be a very difficult task, but it is equally difficult to find one where there is room for another, in addition to those already there.

London, large as it is, is crowded with photographers, and yet others continue opening their studios, and most of them seem to prosper. The same can be said of Dublin, Glasgow, Manchester, Liverpool, and most of our larger towns, and from this it would seem that owing to their ever-changing and ever-increasing population, the larger towns would be the best for a venture. I am not wholly of this opinion, but must confess that I would rather open in London in the midst of the crowd of fellow-professionals, than in a town of, say, 20,000 inhabitants, where there were only one or two. In choice of a locality, if a small town is selected, its nearness to a larger one, especially the capital, must be taken into serious consideration, as there are hundreds of the public who never think of being photographed elsewhere than at the largest town in their neighbourhood. If within twenty miles of the metropolis, they usually have their photographs taken there, although they may have a man close to their home, even a few doors from it, who can give them equally good work at, perhaps, a lower price than they have to pay in town. They consider him good enough to take their babies and their dogs, perhaps to take a view of their house and grounds; but for their own portraits they deem it incumbent on them to patronize Regent Street or Baker Street. This is probably the reason why so many of the leading provincial photographers are so anxious to secure studios in London. The photographer at the fashionable seaside or inland resorts stands on a somewhat different footing to those in the other towns, and often makes a name which is as well known as those of the principal London members of the profession.

The question as to buying a business is a vexed one, there being much to be said on both sides. Those in favour of this mode of procedure hold that a start can be effected with a less capital; that there being a business already established, the buyer of the same will have clients ready waiting for him; and that those who have not already been patrons of the establishment will become so from the fact of its being older established, even although it has

changed hands. On the other side, I would draw attention to the facts that the money paid away to purchase a business would be much better kept in hand as a surplus capital to draw upon, if necessary, during the first few months of opening a new concern; that although a business may be already established, the patrons of the establishment under its late owner are in nowise compelled to continue to support it under a new one, and that in point of fact most of them cease to do so when it changes hands, giving their patronage instead to some other professional in the town whom they know, and who knows them.

The only persons who can buy a business, and do well by so doing, are those who have already had some connection with it; such as the operator or manager under the retiring proprietor. The operator would in all probability do well, where possible, to buy the business in which he had been employed, as the sitters, knowing him, would continue to patronize him as they had formerly done his employer. For an operator from a leading London house to purchase a provincial business is a great mistake; he would do much better to open a fresh studio altogether, and save the purchase money.

To the photographer about to commence a business I would tender the following advice. Never attempt rash things by starting without capital—that is, never open on credit; have all your needful apparatus paid for, and enough capital in the bank to keep you and your family, if you have one, for at least twelve months; do not reckon upon the first year's income as anything—they may be large, they may be moderate, they may be practically *nil*. If you anticipate the first, and are not prepared for the last, the worst is sure to happen. Unlimited credit is, perhaps, useful to an old-established man of business, but to a beginner it is neither more nor less than a curse. Never have on credit what you have money to pay cash for, and if you have no money to pay cash, do without it. Where a beginner has an account with a firm, he is often induced to order goods which he can very well do without, simply because he has not to pay for them at the time, forgetting that some day the account will be presented, and that very probably at a time when he is least prepared to settle it. If you have credit at all, never accept bills.

Never buy a business unless under the conditions I have mentioned, as, added to the reasons I have already adduced against so doing, it is as well to remember that there must be some reason for the business being in the market. If it was a really good paying concern, it would not be sold. I remember some time back reading with interest an article from the pen of Mr. George Bradford in these pages, entitled "A Nice Quiet Little Business," in which he details his adventures in the purchase of a photographic connection, and to which I direct the attention of all would-be purchasers of so-called "nice quiet little businesses," which are mostly all quiet, and no business.

Finally, until thoroughly established, keep your expenses down to the lowest limit, and neither give nor take credit.

## LAW FOR PHOTOGRAPHERS.

BY S. J. DEBENHAM (SOLICITOR).

### CHAPTER XI.—MISCELLANEOUS POINTS—COUNTY COURT PROCEDURE.

I HAVE had to refer to litigious proceedings for recovery of debts, and have mentioned that proceedings may be taken in the High Court of Justice, consisting of two divisions—Chancery and Queen's Bench—or in the County Court. Since commencing these papers, considerable alterations have been made in the jurisdiction of the County Court, which I must now refer to.

By the Act passed last session, the scope and power of the County Courts have been much enlarged and increased. Into the policy of the Legislature in doing this it is not,



perhaps, germane to my purpose to inquire, but at the same time I cannot forbear remarking on the defective and halting manner in which it has been done; and indeed it is right to point out the anomalies I am going to describe, because where there is a choice between the two tribunals, readers may desire to be guided as to the preferable alternative.

The differences between the High Court and the County Court are several. In the first place, one radical difference is, there are no pleadings in the County Court. In the High Court, in most cases, a Statement of Claim is delivered, and in all disputed cases a Statement of Defence also; then there is a reply. Thus, the parties know before going into Court what are the points to be tried.

In the County Court there is no Statement of Claim, and no defence delivered, except in certain cases—viz., set-off, infamy, coverture, statute of limitation, bankruptcy, tender, or statutory or equitable defence.

If the claim be above £5, a jury may be had in the County Court. In the High Court (Queen's Bench Division), a jury may be had in all cases.

The County Court has not the power of trying every description of claim which the High Court has. The County Court has the advantage of the High Court in permitting interrogatories and discovery of documents without the deposit of £5 required in the High Court; for this indulgence the County Court fee is £1 only. Moreover, the jurisdiction of the County Court is limited in amount. I am speaking of the present state of things. The County Court Act passed last session, to come into operation on January 1st next, makes certain alterations which I will treat later on.

Barristers and solicitors have equal right of advocacy in the County Court. In the High Court barristers alone have audience. A man may plead his own case in person in either.

The fees payable to the County Court by the suitor are graduated, according to the amount claimed, increasing up to cases of £20 and upwards, when there is no further increase.

Actions may now be removed from the High Court to the County Court in all cases of debt where the amount does not exceed £50, or where, by payment into Court, it is reduced to this sum. The defendant may also remove a case where damages are claimed, if he can show that the plaintiff cannot pay the costs if unsuccessful, and security for the payment be not given.

It is commonly supposed that the County Court is greatly to be preferred on the ground of expedition. This is, however, to a great extent, a delusion. Many cases occur in the High Court where the trial takes place within three months after the service of the writ. In the County Court, in most cases, except in London and the large towns, the Court only sits monthly (sometimes every two months only); and in London the Courts are sometimes so crowded with business that contested cases cannot be tried on the appointed day, and have to be adjourned again and again. I had a case in the Marylebone County Court in which five months elapsed before a decision was given.

The County Court has not the facilities for evidence possessed by the High Court, nor for enforcing payment when judgment is recovered. The County Court has no power, for instance, of compelling evidence from witnesses abroad. I endeavoured, when on the County Court Commission, to get this power conferred, but it has not been done in the new Act; nor have the facilities for enforcing judgments, which are open to creditors in the High Court, been conferred. The garnisher process, to which I referred in a recent number, is available.

Another difference in the County Court remedies under judgment is the method of levying execution. This is done by the High Bailiff of the Court instead of by the Sheriff, through the plaintiff's solicitor; and in County Courts there is often considerable delay in obtaining the money. Not that this does not occur in the High Court also.

The County Courts are considered to have been established for the benefit of poor litigants, and their original jurisdiction was limited to a much smaller field than is now the case. However, the fees payable for issuing process, and hearing the case, and execution, may amount to 4s. 6d. in the pound (22½ per cent.), which is a severe tax. To come back to the question—When should resort be had to the County Court? There is not much option, as the new Act tends still more to compel suitors to go there.

The County Courts Act, 1888, 51 and 52 Vic., c. 43, and which comes into operation on the 1st of January, 1889, enacts as follows:—

56. All personal actions where the debt, demand, or damage claimed is not more than fifty pounds, whether on balance of account or otherwise, may be commenced in the Court, and all such actions shall be heard and determined in a summary way, according to the provisions of this Act, provided always that except as in this Act provided the Court shall not have cognizance of any action of ejectment, or in which the title to any corporeal or incorporeal hereditaments, or to any toll, fair, market, or franchise, shall be in question, or for any libel or slander, or for seduction, or breach of promise of marriage.

57. Where, in any action, the debt or demand claimed consists of a balance not exceeding fifty pounds after an admitted set-off of any debt or demand claimed or recoverable by the defendant from the plaintiff, the Court shall have jurisdiction to try such action.

The following section provides a new way of removing actions from the County Court to the superior Court, but does not much facilitate such removal. I should say that the right of removal by *certiorari* preserved at the end of the section will not be much favoured by the High Courts now that this enactment is passed.

62. If in any action of contract the plaintiff shall claim a sum exceeding twenty pounds, or if in any action of tort\* the plaintiff shall claim a sum exceeding ten pounds, and the defendant shall give notice that he objects to the action being tried in the Court, and shall give security, to be approved of by the Registrar, for the amount claimed, and the costs of trial in the High Court, not exceeding in the whole the sum of one hundred and fifty pounds, and the judge shall certify that in his opinion some important question of law or fact is likely to arise, all proceedings in the Court in any such action shall be stayed; but if in any such action the defendant do not object to the same being tried by the Court, or shall fail to give the security aforesaid, the Court shall dispose of the action in the usual way. . . . Provided that nothing herein contained shall prevent the removal of any action from the Court by writ of *certiorari* in the cases and subject to the conditions in this Act provided.

The following enactment enlarges the jurisdiction of the County Court in cases of contract to £100 instead of £50 as formerly.

65. Where in any action of contract brought in the High Court the claim endorsed on the writ does not exceed one hundred pounds, or where such claim, though it originally exceeded one hundred pounds, is reduced by payment, an admitted set-off or otherwise, to a sum not exceeding one hundred pounds, it shall be lawful for either party to the action at any time, if the whole or part of the demand of the plaintiff be contested, to apply to a Judge of the High Court at Chambers to order such action to be tried in any court in which the action might have been commenced, or in any part convenient thereto; and on the hearing of the application the judge shall, unless there is good cause to the contrary, order such action to be tried accordingly, and thereupon the plaintiff shall lodge the original writ and the order with the registrar of the Court mentioned in the order, who shall appoint a day for the trial of the action, notice whereof shall be sent by post or

\* This means a claim for damages not arising out of contract.



otherwise by the registrar to both parties, or their solicitors, and the action and all proceedings therein shall be tried and taken in such Court as if the action had been originally commenced therein, and the costs of the parties in respect of proceedings subsequent to the order of the Judge of the High Court shall be allowed according to the scale of costs for the time being in use in the County Courts, and the costs of the order and all proceedings previously thereto shall be allowed according to the scale of costs for the time being in use in the superior Court.

66. Reserves the right of removal in actions of tort to the County Court on the defendant's application, showing that the plaintiff is without means on his failing to give security.

67. Deals with the equity jurisdiction of the Court, which embraces cases up to five hundred pounds; and gives the County Court jurisdiction over most of the causes of action in which equitable remedies are available in the High Court, not, however, including injunctions, and proceedings in respect of damage to light.

Section 86 extends the default summons process to all claims for debt or liquidated demand except as below stated. I must explain this. There are two classes of summons in the County Court; one is the ordinary form, made returnable on a day when the Court is sitting, and which does not require personal service. In these cases the causes are called in their order by the usher, and if the defendant does not appear or dispute the claim, are adjudicated upon by the registrar. The other form of summons will only be available, as I have said, for a debt or liquidated demand. It requires personal service, and at present is confined to cases where "the action is for the price or value of goods . . . sold and delivered to the defendant to be used or dealt with in the way of his trade, profession, or calling." This section allows the default summons to issue for any debt or liquidated demand, but sub-section 6 enacts that a summons shall not issue for any amount above five pounds, except when the claim is for goods which, or some part of which, were sold and delivered or let on hire to the defendant to be used or dealt with in the way of his trade, profession, or calling. In these default cases, if no notice of defence be given, the plaintiff can sign judgment on default thereof, but if a notice be given the registrar fixes a day for trial, and gives notice to the parties (sub-section 3). The necessity for personal service of these summonses, and the fact that summary judgment (which can be signed eight days after service instead of sixteen as at present) may be prevented by the defendant giving a simple notice, render the use of the ordinary summons very general, even in cases where the other mode is available. There is one advantage in this process, however, which I should mention. It is that payment by instalments cannot be ordered unless the plaintiff consent (sub-section 2).

In cases exceeding £20, however, whether default or not, the order will not be for instalments without plaintiff's consent.

The option of bringing actions in the High Court or County Court is settled by Section 16, which is as follows:—

116. With respect to any action brought in the High Court which could have been commenced in a County Court the following provisions shall apply:—

1. If in an action founded on contract the plaintiff shall recover a sum less than twenty pounds, he shall not be entitled to any costs of the action, and if he shall recover a sum of twenty pounds or upwards, but less than fifty pounds, he shall not be entitled to any more costs than he would have been entitled to if the action had been brought in a County Court: and

2. If in an action founded on tort, the plaintiff shall recover a sum less than ten pounds, he shall not be en-

titled to any costs of the action; and if he shall recover a sum of ten pounds or upwards, but less than twenty pounds, he shall not be entitled to any more costs than he would have been entitled to if the action had been brought on.

## A BOOK OF WOODBURY'S "TREASURE SPOTS OF THE WORLD."

BY WILLIAM LANG, JUN., F.C.S.

I HAD the good fortune a week or two ago to come across, in a secondhand bookseller's, a copy of a work which possesses more than a passing interest. Woodbury's process of mechanical printing is now a matter of more than twenty years' standing, Woodburytype having been brought forward by its author in the year 1866. In connection with photographic processes it is always instructive to note the appearance presented by pictures produced, it may be, many years previously. "Treasure Spots of the World," was issued in 1875, and the freshness and beauty of the twenty-eight Woodburytypes illustrating it testify to the enduring nature of the process employed. In the preface Woodbury guarantees the proofs from fading, or even losing their brilliancy, and the pictures at the present moment bear out the fact that Woodbury did not overstate the case. In character the work may be said to be cosmopolitan.

Each picture has a certain amount of letterpress devoted to it, and the contributors are as varied as the subjects on which they write. Woodbury has written the articles attached to the following subjects:—Interior of the Mosque at Cordova—Colossal Figures at Singa Sarie, Island of Java—Niagara River in Winter—Amsterdam—Colonnade in the Masjid-i Kutb-ul-Islam, Delhi, and the Rock of Gibraltar. Baden Pritchard discourses on Alpine scenery, the picture of an ice cavern furnishing him with his text. Alfred R. Wallace (presumably the naturalist) has an enthusiastic article on tropical scenery suggested by the picture of a river scene in Java, the negative in this instance having been taken by Woodbury himself. J. Traill Taylor has a descriptive article in connection with a view of Tintern Abbey. J. Thompson, F.R.G.S., contributes some interesting details regarding Bangkok, the capital of Siam; the print is from a negative by the same gentleman. We note also that the view of Amoy Harbour, China, with the accompanying letterpress, has been furnished by Mr. Thompson.

We find that the negatives from which the prints have been taken are from many artists—Braun, England, Good, Shepherd, &c. Where all are so excellent it is somewhat difficult to single any out for distinction, but there can be no doubt that well filled in subjects lend themselves best for reproduction in Woodburytype. A picture of the courtyard of the Alcazar, Seville, from a negative by Stuart, is simply perfect. Cordova Cathedral is another very fine reproduction, as also the Court of Lions at the Alhambra. The only two English views which have been chosen are the Nave of Wells Cathedral, and Tintern Abbey. The latter print has been pulled on paper with a bluish tint, giving it somewhat the appearance of a moonlight scene. Two other pictures in the work have been finished in the same manner; these are, the Cloisters of Belem, Portugal, and the Bridge of Sighs, Venice. For a certain class of subjects the employment of paper having a bluish shade might be more largely adopted than it is. To the writer's mind it is the most effective method of dealing with pictures where architectural reproductions are concerned.

Enough has been said to indicate the nature of this book of Woodbury's, and the object, as the editor remarks, in issuing such a work was "to place before the public a selection of the most celebrated of the world's beauties and wonders which, being all pictures, the unerring sun's work are necessarily true to the places they represent without any flattery." From the handsome appearance, both internally and externally, it was intended as a book suitable



for presentation, but whether it realised Woodbury's expectations regarding it the writer has no means of knowing; to judge, however, from the comparatively low price at which the present copy was secured, it would appear as if the work had not found favour with the public in the manner which it should have done and was fairly entitled to. It cannot yet be said to be an old book, but it may safely be affirmed that had the illustrations been produced by means of the silver print, the "Treasure Spots of the World" would have presented a very different appearance indeed. A photographic art book, when published, it remains still an art production, thanks to the process which has been employed in illustrating it. Woodbury contemplated issuing yearly a similar collection, naively remarking, "The endless choice of earth's beautiful scenery will enable us, should the present volume receive the esteem of the public, to present yearly a collection of the camera's choicest renderings." Perhaps some of the readers of the PHOTOGRAPHIC NEWS may be able to enlighten us as to whether this idea was carried out. In conclusion, it may be stated that the original cost of the work was a guinea, and the publishers were Messrs. Ward, Lock, and Tyler, of London.

### SOME PRACTICAL HINTS.

#### HOW TO USE THE ISOCHROMATIC PROCESS FOR PHOTO-LITHOGRAPHY AND PHOTO-ENGRAVING.

BY J. O. MOERCH.

THE interest attached to the photography of coloured objects is continuing to exercise the minds of all classes of photographers. Isochromatic or orthochromatic plates of several makers may already be found at every photographic supply store, and they claim to be qualified to reproduce the natural colours in their proper value. Notwithstanding such a claim, many an amateur and even professionals have been puzzled by finding these plates only little superior to the common plates of the trade. For instance, light purple and deep red affect the plate much the same, and, without the use of a colour screen, up to now even other colours are not giving correct values with the isochromatic plates. On the other side, this colour screen is a cause for inconveniences in focussing, especially when the highest degree of definition is wanted, as, for instance, in reproducing line drawings for photo-lithography or photo-engraving. Another inconvenience has further to be dealt with. The isochromatic plates are not qualified to produce a glass-clear line on an opaque ground. Gelatine plates altogether are always considered with a good deal of suspicion, even when their maker claims for them all the good qualities of the old wet plate in reproducing line-engravings, and operators for the said purposes prefer the well-known old process.

The problem of reproducing line-drawings of several colours is doubtless treated more successfully by using the collodion. Taking advantage of the most recent results of Dr. Albert, in Munich, and Dr. Eder, Vienna, I have made out a method, which certainly does not give absolute exactness in the photography of coloured objects, but whilst striving for greater exactitude it forms a valuable way for the practical artist.

Two sources of inconveniences in the collodion process had to be overcome before I could undertake to do practical work in that line. First of all, the silver bath was by the use of dyes in the collodion often contaminated, and on the other side the process worked too slow. I now decided to make use of Obernetter's reversed process, which, by its inventor years ago, was properly devised to the purpose. The collodion emulsion, though not offering any serious difficulties, took more of my time than I could spend, while the reversed negative process was soon enough in working order. The keystone of it is the preparation of the collodion, for which the following is quite a reliable formula:

**Silver collodion.**—Dissolve five grammes of nitrate of silver in two centimetres of distilled water by gently heating it on a gas-burner, and add one drop of pure nitric acid. If properly dissolved, pour into this silver solution by stirring 250 cubic centimetres of alcohol of ninety-six per cent. It is a good plan to warm the alcohol in the water bath before you mix it with the silver solution, in order to avoid any precipitation; then add six grammes of pyroxilin and 150 centimetres of pure ether; then

shake the bottle from time to time during half an hour. If the cotton wool is properly dissolved, the collodion may be filtered and is now ready for use. It gets its best qualities within twenty-four hours, and keeps for months. With this silver collodion you can now produce either (1) pure iodide plates, (2) pure bromide plates, or (3) iodide-bromide plates.

Pure iodide plates are the most suitable for copying any kind of line drawings, and are as sensitive as the wet plate. Bromide plates have not quite the same qualification; the line is not as clear and the ground has less intensity, notwithstanding they intensify well, and are producing negatives with good printing qualities for our purpose. Concerning the degree of sensitiveness, they can obtain double the one of wet plates by a certain treatment and when exposed wet.

As only few or none of your readers will know the details of the reversed negative process, I will give a full description of it, as well as hints how to use it for several purposes. Invented in the time when the rapid gelatine plates were absorbing the full attention of the men of the craft, it never was properly introduced by any photographer, though on its importance, especially for isochromatic work, all the authorities were convinced.

The glass plate must be properly cleaned, as required for the wet process. The edges must be coated with albumen (1:400), and, when dry, the silver collodion is passed over the surface as one would do in the wet process, and the plate must now pass either in a bath of iodide or of bromide salts, for which the following are the formulæ:—

**Iodide Bath.**—Dissolve ten grammes of iodide of potash in 120 centimetres of water, and add one drop of nitric acid.

**Bromide Bath.**—Ten grammes of bromide of potash dissolved in 120 centimetres of water, with the addition of one drop of nitric acid.

If an iodide bromide plate is wanted, your formula corresponding to the proportions of sensitizing salts in the wet process is as follows:—Ten grammes of iodide of potash, two grammes of bromide of potash, dissolved in 144 centimetres of distilled water, with one drop of pure nitric acid.

By keeping the three baths, you are ready at any time for any class of work, be it the reproduction of a steel engraving, or be it that of an oil painting.

For line reproductions you certainly will prefer the pure iodide, if not the iodide-bromide plate, while for any kind of isochromatic work the character of the bromide plate, giving much more details, will correspond better. In order to produce your plate you bathe it now in a bath corresponding to one of the above formulæ during three to five minutes. After this time, the plate is properly washed in a dish with water, in order to take off any excess of iodide or bromide salts. Iodide, as well as iodide-bromide, plates are not so sensitive to light in any way, and no care has to be taken about light. Bromide plates alone must now be preserved from the influence of light. In this state they keep any length of time, if left in a dish with water. Therefore, they always may be prepared in the evening for the following day, which means a considerable saving of time for the operator.

If you wish to use the plates, they have to be passed with the sensitizer which, for iodide plates and iodide-bromide plates consists of a solution of nitric silver, 1:8, with a few drops of a solution of iodide of potash in the proportion of 1:100 (say 5 drops to 100 centimetres of silver solution), and one drop of nitric acid. As soon as this solution is poured over the plate, which ought to be done several times, it must be preserved from light. If a long exposure is intended, a few drops of pure glycerine may be added to the sensitizing solution. If you wish to produce the isochromatic effect you also may add a dye to it (blue anilin, eosin).

Bromide plates are sensitized with five grammes of nitrate of silver, dissolved in a hundred centimetres of water and five drops of pure glycerine. This sensitizer must be neutralized with strong ammon. liq. until the solution gets muddy. As these plates are now much more sensitive than wet plates, you must carefully avoid too bright a light in the dark-room, or they will fog.

The iodide and iodide-bromide plates are best developed with the common iron-developer of the wet process. For bromide plates, an alkaline developer is to be preferred. Any good developer used for gelatine dry plates will do. Certainly all the precautions used in developing dry plates have also to be taken, if you expect a favourable result. (Before developing, the sensitizer has to be washed off.)

So far goes the description of Obernetter's reversed negative



process. In order to use it for isochromatic work, I have combined it with the acquisition and experiences of Dr. Albert and of Dr. Eder. Both of them are working the collodion emulsion for the purpose, and they are using eosin silver as the best sensitizer known for the true reproduction of the proper value of colour. Eder's emulsion is double as sensitive as the wet plate, and the same result is obtained with our bromide plate.

Albert now proposes to introduce pikrin salts, instead of using a yellow light screen, and he succeeds pretty well in absorbing even the ultra-violet rays. He uses the eosin silver, which is only soluble in ammonia. As ammonia has a destroying effect on pyroxyline, he neutralizes it with picric acid, forming in this way picric ammonia, which is the proper dye for absorbing the ultra-violet rays.

This effectual sensitizer can now easily be applied to our plates, producing the very same result as if used with the collodion emulsion.

Every operator, with a little skill, will be able to complete this formula, and will soon find out the great advantage this method has for practical work. No emulsification is needed, one collodion, ready for any purpose, no more troubles in the silver bath, as in the wet process, and even an easy method of producing dry plates for contact printing for any purpose.

One more important point—especially for photo-lithography,—has to be mentioned; if you take three negatives for colour printing, by using the glass screens, these negatives generally fail of being congruent and in register, because the focus is not the same for the three screens. If, instead of this, the operator is dyeing the sensitive plate with materials answering the purpose, the focus is the same, the negatives are in congruity, and the register of the plates is secured.

A very important quality, which the gelatine dry plates lack, is that the plates produced by the above method may be intensified easily by all the intensifiers used in the wet process. No long washing, no fear for spots, quickly drying, and properly printing!

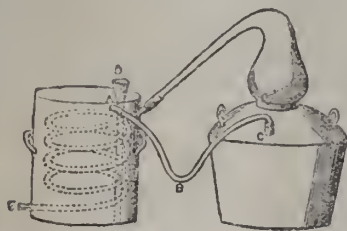
The glycerine you wish to make use of must be the most purified you can obtain, and even then you will do well to mix it with a few drops of silver solution, and to expose it to the influence of direct sunlight for a time. All the impurities which might influence the process in a troublesome manner are separated and go to the bottom of the bottle. In using it, care should be taken not to use the bottle.

In my next article I shall say more about the experiences I encountered in using this process.—*The American Lithographer and Printer.*

#### AN AUTOMATIC STILL.

The arrangement here described is one that may readily be adapted to, and is specially suited for, the old-fashioned stills which are in frequent use among pharmacists for the purpose of distilling water. The idea is extremely simple, but I can testify to its thorough efficiency in actual practice. The still is of tinned copper, two gallons capacity, and the condenser is the usual worm surrounded with cold water.

The overflow of warm water from the condenser is not run into the waste pipe as in the ordinary course, but carried by



means of a bent tube, A, B, C, to the supply pipe of the still. The bend at B acts as a trap, which prevents the escape of steam.

The advantages of this arrangement are obvious. It is perfectly simple, and can be adapted at no expense. It permits of a continuous supply of hot water to the still, so that the contents of the latter may always be kept boiling rapidly, and, as a consequence, it condenses the maximum amount of water with the minimum of loss of heat. If the supply of water at

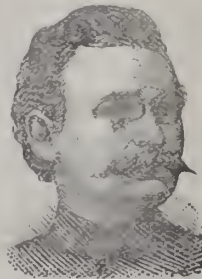
D be carefully regulated, it will be found that a continuous current will be passing into the still at a temperature of about 180° F., or, if practice suggests the desirability of running in the water at intervals, this can be easily arranged. It is necessary that the level at A should be two inches or thereabout higher than the level of the bend at C, otherwise there may not be sufficient head to force a free current of water against the pressure of steam. It will also be found that the still should only contain water to the extent of about one-fourth of its capacity when distillation is commenced, as the water in the condenser becomes heated much more rapidly than the same volume is vaporised. By this expedient a still of two gallons capacity will yield about half a dozen gallons per day, a much greater quantity than could ever be obtained under the old system, which required the still to be recharged with cold water every time one and a half gallons had been taken off.

The objection to all such continuous or automatic arrangements is, of course, that the condensed water contains all the free ammonia that may have existed in the water originally, but it is only in cases where the water is exceptionally impure that this disadvantage will become really serious. The method here outlined has, no doubt, occurred to many, and may probably be in regular use, but not having seen any previous mention of the idea, I have thought that it might be useful to some pharmacists who prepare their own distilled water.—By T. MABEN, in the *Pharmaceutical Journal*.

#### FREE SPEECH IN AMERICA.

IN the United States, publications denounce disreputable characters much more fully than is the case in England, and we have more than once commented on the "Dead Beat" list of the *St. Louis and Canadian Photographer*, and we now give some samples out of the current number.

"When we first published Mr. Hohmeier as a dead beat in our January number, we firmly believed him to be such, from the numerous reports received; but it seems from his letters to us and Mr. G. Cramer, and the editor of one of our esteemed New York contemporaries, that we are persecuting him, and that he is not that kind of 'hair pin;' that he will immediately seek for justice in the courts, and we will be made to suffer. We hope, most sincerely, that he will be accorded full justice, and that he will not procrastinate in this laudable undertaking. Of course our public apology will shield us from harm, so here it is: Franz Hohmeier, whose likeness we here with present, is a dead



beat of the worst sort, swindler! story teller (putting it mild), bigamist, and everything that goes to make up a bad—very bad man. He has the cheek to ask that good man, Mr. G. Cramer, to intercede in his behalf, to stop our publishing him, at the same time having swindled one of his (Mr. Cramer's) demonstrators out of \$5; also, to ask of the editor of a New York photographic publication the use of his columns to give us a gentle raking down, at the same time he knew the editor was cognizant of the fact of his having swindled a firm in that city out of \$100. Hohmeier worked for H. S. Squyer, Auburn, N.Y., collected about fifty dollars in money; purloined goods from the store, and departed, but was arrested and brought back. Through his piteous pleading was not fined, but instead was again given a job, when he once more stole from his benefactor, and skipped for parts unknown. C. E. Randall, of whom we gave a description last month, and promised further developments in this issue, is, at this writing, at Anna, Ill., where he started in to cut prices, ruin the business, and beat the people generally. F. J. Williams, who was spoken of last month, has undergone an investigation, and proves to be a suitable candidate for continua-



tion in this list. He swindles photographers everywhere; contracts debts about town on the strength of working for Mr. So-and-So, then skips out, leaving many to mourn misplaced confidence. He is about five feet six inches high, weighs about 145 pounds, heavy set, light hair, and blue eyes. He is wanted at Lincoln, Blair, and Decatur, Nebr.; Creston, Iowa, where he is reported as deserting a worthy and industrious wife, about two years ago."

### Notes.

Professor Baldwin has, we believe, finished his sensational descents from the clouds for the season, being compelled, indeed, to go into winter quarters, like an army on active service, or a yacht. When he resumes his perilous parachuting, however—and it is too much to hope that his thoughts will not again turn skywards in the Spring—we would suggest that he would add new interest to his feat if he were, in the course of his descent, to "take a shot"—in a strictly photographic sense, only, need we say?—at the open-mouthed crowd gathered to watch him risk his legs and limbs. Many instantaneous negatives have been taken of him, we believe, whilst dropping; let him retaliate, then, and take one of his spectators. If successful, the picture would be probably unique; for whatever silly things a gaping crowd may do, they are not in the habit of going and having their portraits taken in the very act of gaping!

The experience of photographers, could it be collected, of the ground landlord in connection with photographic studios would form an interesting chapter. How much has been added to the value of property in London by the building of studios it would be difficult to say, but it may be taken as an undisputed fact that in every instance the ground landlord has derived the benefit, or will do so when the leases expire. Though he may not have expended a farthing on these additions, he puts into his pocket the increased rent which the additions bring, and will continue to do so while the present unjust laws continue.

A case in point of the rapacity of the ground landlord is related by Frank Banfield, in the *Dispatch* this week. A photographic studio and rooms, about twenty years ago, were added to a house in North London at a cost of about £200. Some time after the tenant of the house, a picture-frame maker, failed, and his goods were sold by auction on the premises. This was contrary to the lease of the ground landlord, who at once contended that the lease granted by the picture-frame maker to the photographer was null and void. Litigation followed between the superior landlord and a mortgagee who had advanced money on the lease of the bankrupt shopkeeper; the landlord gained the day, and the result of his victory was to immediately advance the unfortunate photographer's rent from 80 guineas to £150, and this on property which had not cost the landlord one penny piece. Similar stories, we have not the least doubt, could be related by many of our readers.

But England is not alone in the possession of the rapacious landlord. A correspondent of the *Photographic Times*,

writing on the question of photographic competition in America, says: "No class suffers so much from the monopoly of land values as the photographers. They go into a second or third storey, rig up the place, build up the business, and have the rent raised on them for their pains; and all the time the store underneath them is paying a fair rent for the investment of ground and building, unless it has changed hands in a land form." The same correspondent remarks, incidentally, that in Tennessee photographers are taxed from 100 dollars to 150 dollars per annum. Apparently, by the State of Tennessee, photographers are regarded in the light of publicans or dogs.

The instantaneous flash, unless the mixture is kindled by electric agency, is apt to be instantaneous only in its light; the preliminaries to ignition are apt to defeat the object sought to be obtained. This was the case in the attempt to photograph "Mr. Crowley," the chimpanzee, in Central Park, New York. With considerable expense and trouble some photographers brought there a couple of large sized cameras, and with great care (for their plates were large, and something unusually fine and grand was aimed at) focussed the same upon the gentleman from foreign climes. For certainty of results they had provided themselves with some flash powder, and when ready the exposure was made. Nothing was neglected save some means to keep "Mr. Crowley" in position, and for want of these the photographers discovered, to their disgust, that when the light flashed "Mr. Crowley" wasn't there. A most excellent character had been given the chimpanzee for sitting perfectly still; but the fact was, when he saw the scintillations of fire creeping up to the powder he thought it was time to disappear, and so he did, and no amount of persuasion could make him come back.

The differences which are observable in the photographs of lightning in regard to the form of the electric current are, Ch. Moussette in *Comptes Rendu* points out, possibly due to accidental vibrations caused by the thunder, the wind, or the shaking of the earth. Some experiments made by M. Moussette went to prove this. A white on black drawing of flashes inclined at different angles was made and photographed—first, with the camera secured from vibration; and, second, with the camera slightly jerked at the moment of exposure. In the first the result showed the flashes fine and sharply defined, and in the second the flashes presented the appearance of striated ribbons, save where the lines of the drawing were parallel to the direction of motion of the camera.

Some of the non-photographic visitors at the Pall Mall Gallery are greatly puzzled at the frequent recurrence of the word "platinotype." Not a few take platinotype to be the name of the process by which the negatives are taken, and do not know that it simply applies to the print. "Oh, yes," said one visitor the other evening, "that's by the new instantaneous process. It's something to do with silver. Plating, you know." It is needless to say that the critic was a lady. The Council might do worse than



append to the catalogue a brief explanatory note as to the meaning of the various technical terms, for the benefit of the uninitiated. Who, except a photographer, understands anything about "bromide paper," "Pizzighelli's process," or even "Autotype"?

The photo-relief series of maps issued by the Society for Promoting Christian Knowledge have been referred to from time to time in our columns. In them the degree of the elevation is indicated by the intensity of the tint printed over the map. The latest example sent for our notice is a map covering the southern suburbs as far down as Banstead Downs, also showing east as far as Blackheath, and west as far as Twickenham; a map likely to be acceptable to cyclists, especially as it is sold at the very low price of sixpence. Besides the tints, there are figures giving the height above the sea level in feet.

Details are published from time to time of photographs which, from the circumstances surrounding their origin and production, or those accompanying their presentation to their happy possessors, may fairly be deemed historical. Such an one, for instance, was that which Queen Victoria gave to the late Mr. Peabody of herself, in a jewelled frame, after he had made his munificent bequest to our sovereign's poorer London subjects. And if Mr. Joseph Chamberlain were himself to be the judge, he would probably also characterise "historical" the panel portrait of her Majesty, with her autograph, which he accepted when he had refused a G.C.B. for his abortive labours at Washington.

Another specimen of the photographs we allude to is in possession of Don Antonio Canovos del Castillo, the well-known Spanish statesman to whom more than to any man Alphonso owed his restoration to the throne of his ancestors. Nor was the late King of Spain ungrateful. Honours were pressed on Senor Canovos with a lavish hand. He might have been duke, prince, grandee of Spain, either, or all three, but he has always gratefully but firmly declined a title, and remains to this day simply Canovos. But he has had his reward, he tells his friends; and to those admitted to the room in which he works, he proudly points out a simple photographic group, neatly framed, which occupies the place of honour above his mantelpiece. It is the photograph of the late king, his wife, and the children that had been born to him when he died. And at the foot of it, in poor King Alphonso's own handwriting, are the words, "To Senor Canovos, from a grateful Spanish family."

We alluded, a fortnight since, to the growing use of photography in illustrating a hospital surgeon's clinical notes. In many interesting cases, as we then stated, photographs have actually been taken to throw light on a diagnostic or pathological point of interest; but we now hear that a doctor's right to photograph the deceased limb, say, or any part of a hospital patient without his consent, has been challenged. To take an extreme case, there is, at an East End hospital, a patient known as the

"Elephant-Man." He might surely object, were he of a mercenary disposition, to his hideous deformity being photographed for a medical journal, on the ground that he might, by reserving the copyright, so to speak, make a fortune out of the negative of his own face, should he ever re-appear in public. On such a ground of objection he would of course deserve scant sympathy, but it would assuredly be very hard on him if his doctors could, without his consent, present his terrible disfigurement, or rather defacement, to the world. By a parity of reasoning, too, it would seem that patients who certainly possess the power of selling their bodies after death, should also have legal right to dispose of the photograph of any portion of those bodies diseased when they are living.

#### PHOTOGRAPHIC ENGRAVING ON GLASS, AND OTHER APPLICATIONS OF FLUORINE IN PHOTOGRAPHY.

BY P. C. DUCHOCHOIS.

FLUORINE, on account of its great affinity for all the metals to which it unites directly, and its destructive action on glass and porcelain, can be isolated only with the greatest difficulties. Frémy succeeded to effect its dissociation from potassium-fluoride by means of electricity. Prat seems also to have isolated it in employing a recipient of fluor-spar.

It is described as a gaseous element, heavier than the air, colourless, fuming in the air, decomposing water, and smelling like chlorine, of which it possesses some of the properties, such as bleaching organic matters and decomposing the bromides and iodides. However, most of its physical and chemical properties are likely unknown, for it is difficult to keep it for any length of time.

No combination of fluorine with oxygen is known. With hydrogen it forms an exceedingly corrosive compound, hydrofluoric acid, prepared by heating fluor-spar (calcium-fluoride) with sulphuric acid in a platinum retort connected with a receiver of the same metal placed in a powerful frigorific mixture, into which the acid—which is gaseous at common temperatures—is liquefied. In that state hydrofluoric acid boils at 60 degrees, freezes at about 4 degrees Fahr., emits white fumes in the air, and when poured into water it unites with it with great energy, evolving considerable heat. It should be handled with care, for its action is very corrosive; a drop falling on the skin produces a painful ulceration long to heal. Its fumes are suffocating and dangerous to breathe. Ammonia at once combines with it, and can, therefore, be used to neutralize its fumes, but, as a remedy, it should not be depended upon, for the soluble fluorides are as poisonous as the acid itself. The best antidote is calcium chloride, followed by emetics.

Hydrofluoric acid attacks all the metals with the exception of lead, mercury, silver, gold, and platinum. It has no action on the metalloids, boron and silicon excepted. Its affinity for the latter is remarkable; it decomposes all the silicates. It is on this acid action that is based the engraving processes on glass, which is a compound of various silicates.

Many fluorides are soluble in water. They are obtained by the direct action of hydrofluoric acid on the metals, or by neutralizing their oxides with the acid. The fluorides of the alkali-metals (potassium, sodium, and ammonium) have an alkaline reaction, and slowly attack glass, which is thereby discoloured. Under the influence of heat this action is more rapid.

Sodium fluoride has been recommended by F. Scott Archer in the iron developer, employed for rapid exposures in the wet collodion process. The formula is as follows:—

Ferrous sulphate	...	...	...	7½ drams
Sodium fluoride	...	...	...	25 grains
Glacial acetic acid	...	...	...	3 fl. drams
Formic acid	...	...	...	1 fl. dram.
Alcohol	...	...	...	2 fl. drams.
Water	...	...	...	1 pint

On the suggestion of Blanquart-Evrard, it was also employed in the calotype, albumen, and collodion processes to introduce silver fluoride in the sensitive film as an accelerator. It is doubtful whether any advantage can be derived from it; moreover



silver fluoride is very soluble in water. No precipitate is formed when an alkaline fluoride is added to a silver nitrate solution.

To engrave on glass several processes are employed in manufactures. Generally, a thin coating of wax, dissolved in four parts of turpentine, is applied on the plate, and a design placed behind it is counter-drawn by removing the wax with a pointed tool. The plate is then placed over a lead tray containing a small quantity of finely-powdered fluor-spar and sulphuric acid, to form a thin paste, when, by slightly heating, gaseous hydrofluoric acid is evolved, and in a few minutes etches the glass on the parts not protected by wax.

When an original design is drawn, some bitumen is dissolved with the wax, and the plate placed upon a sheet of paper in order to see the drawing white on a tinted ground. Another method consists in pressing into perfect contact with the plate a pattern waxed both sides, and to slightly soften the wax by heating the plate over an alcohol-lamp in order to make it adhere everywhere. The whole is then submitted to the fumes of the acid, as above explained.

Good results are also obtained by applying on a finely ground glass and opal a pattern—lace, tulle, lace-paper, &c.—previously imbued with a greasy substance, and removing it after having carefully softened the waxy substance by heating the plate, so that it leaves its sharp, greasy impress thereon. In this case a dilute solution of hydro-fluoric acid is poured on the plate, forming a tray by bordering it with wax; or, if more convenient, powdered fluor-spar and sulphuric acid are spread over the plate, letting the action proceed for a certain period. The engraving obtained by these latter methods is transparent on an opaque ground, for, what is remarkable, by etching with the fumes of the acid, the design is opaque; whilst it is transparent by dissolving the glass or other material with a solution of the same.

Similar processes are employed to engrave on glass-ware—cups, goblets, bottles, &c.—but the object is then dipped in the dilute acid, poured in a gutta-percha vessel, taking care to protect by a stopping-ground—shellac or bitumen varnished with wax—all the parts which should be reserved.

Although good etchings are made in manufactures by the processes just described, none, however, can be compared for delicacy of details and artistic effects to those which may be produced by photographic processes, using a negative or a transparency, according as the etchings should be made on ground, opal, or ordinary polished plate glasses, and, also, according to the method employed for etching. When the subject is taken from nature, or when an engraving in aqua-tint or lithography is copied, it is of course necessary to convert it into a photographic image in lines or dots. Several methods can be devised for that purpose. The following, which is also employed to obtain photo-typographic tint blocks, is quite effective. It consists in placing between the discs and the plate prepared to receive the impression before etching, a print in straight, dotted or crossed lines, 100 to 150 to the square inch—obtained from a copper plate or a box-wood block cut by machinery. These prints should be made on tracing paper or on collodion films.

To engrave it, it is best to select a glass ground depolished by hydrofluoric acid, which produces a grain much finer than that obtained by any other means. The reason of selecting such a glass is that its surface can be netted like a lithographic stone or a grained zinc plate, and retain moisture for a certain period, which is quite important, as will be seen further on.

The plates are prepared with a layer of bichromated albumen, upon which the impression is formed, or a carbon print may be developed on its ground surface.

*First Process.*—Beat, to a thick froth, the whites of, say, three eggs, 90 minims of concentrated aqueous ammonia, and 45 grains of potassium bichromate finely powdered. Let settle for a few hours, and decant the clear liquid, filtering it through flannel. This solution keeps well in the dark for three or four weeks.

For coating, provide a round wooden stem about 8 inches long, 3 or 4 inches in diameter, and cut at one end in the form of a cup, upon which should be adapted an india-rubber ring, the whole forming a pneumatic holder. Upon this fix the plate firmly, wet its ground surface under a tap, let it drain, and flow twice over it, in opposite directions, the bichromated albumen, pouring off the excess in a vial. This done, tilt the plate to distribute the liquid accumulated at the edges, and taking the holder between the hands make it revolve slowly at first, then more rapidly, so as to leave on the plate a thin and even layer of albumen. Detach it now, place it on a levelled stand in the dark room, and let the film dry spontaneously. The plates should be prepared the day they are wanted for use, for in drying the

bichromated albumen becomes insoluble in the dark in a short period.

The plate is now placed on a transparency with a clean plate on top, interposing between them the tracing paper printed into lines, as it has been explained, when it is exposed for about a minute in sunshine, 10 to 15 in the shade, and even for a longer period, according to the intensity of the light, for the parts acted on should be made insoluble through the whole thickness, otherwise the albumen would dissolve in the subsequent operation. After the insolubility a printer's roller charged with ink is passed over the albumen film, so as to cover it with a very thin layer of soft diluted greasy ink.\* The plate is then immersed in cold water, where in a certain period the albumen dissolves in the parts not acted on, carrying the ink with it. Sometimes, especially when the ink is a little thick, it is necessary to assist the development by rubbing the film with a soft rag under water until the lines stand perfectly clear.

After rinsing and drying, the plate may be etched by flowing diluted hydrofluoric acid over it, but it is advisable before so doing to pass again the roller, charged this time with hard ink, in order to well protect the reserve from the action of the acid. For that purpose the plate must be slightly wetted with a sponge imbued with gum-water, which latter, being retained by the grain of the ground glass, prevents the ink from adhering to the clear glass. Indeed, from a plate so prepared, prints can be pulled out as easily as from lithographic stones or zinc plates.

*Second Process.*—Develop a carbon from print from a transparency on the ground surface of the plate, immerse the proof for a minute in a 2:100 solution of potassium bichromate, let dry, expose successively both sides of the plate to sunshine, wash out the bichromate, and when the film is dry, ink it and proceed as above explained.—*Anthony's Photographic Bulletin.*

## A NEW DETECTIVE CAMERA.

BY F. C. BEACH.†

THE tendency of recent improvements in apparatus for taking instantaneous photographs has been in the direction of simplification, that the uncertainties usually met with by the photographer may be reduced to a minimum.

One of the most annoying things connected with so-called detective cameras is the necessity of drawing out the slide, especially in bright sunlight, since they are seldom accurately light-tight. It will be recalled that the Nash camera and the concealed Test camera were both intended to obviate the use of plate-holders. In each instrument successive pictures can be taken without drawing slides. The latest improvement, however, is the utilization of paper as temporary support for the sensitive film, now so successfully worked as to enable one to obtain negatives with the utmost certainty.

The apparatus I wish to show you to-night is designed to be a universal camera on a small scale, yet of such capacity that one may take, figuratively speaking, an unlimited number of pictures. It is called the "Kodak" camera, and has just been introduced by the Eastman Company at Rochester, who, as is well known, have the credit of making very perfect apparatus. The novelty of the camera is mainly in its simplicity, compactness, ingenious shutter (which cannot get out of order), the manner of securing the different parts in place, and the interchangeability of parts. You will observe that it looks like a small box neatly covered with black leather. In the front section is the shutter and mechanism for winding up the shutter spring. I will remove the front of the camera by taking out two screws, which, as you will see, exposes to view the shutter. In a few lantern slides I have had prepared, shortly to be projected on the screen, its chief feature will be easily seen.

The shutter is a model of compactness, and is nothing more than a metal cylinder having two square diametrically opposite apertures, revolving in one direction continuously around the rear and front of the lens tube, enclosing the lens as if it were in a box, and could only be exposed to view when holes in the circumference of the box came opposite, as it (the box) was rotated. The propelling spring is located in the end of the shutter, and is wound up by an adjacent winding barrel revolving on the same shaft. The winding barrel has a spring inside which rotates it in the opposite direction after it has been revolved in the other, by pulling up on a light cord. A small

\* The ink, diluted with turpentine, can be applied with a pad of chamois leather when a roller is not at hand.

† Read before the Society of Amateur Photographers of New York.



spring pawl in the circumference engages with the ratchet disk connected with the shutter spring. By pulling up on the cord the pawl on the winding barrel rotates the ratchet disk, thus winding the spring. When released the cord flies back, and is partly wound up on the circumference of the winding barrel. Two or three pulls on the cord is all that is needed to wind the shutter spring to its full tension. A very simple device is provided for releasing and intercepting the shutter at each revolution, which is automatic in its action. The little brass pin on one side, when pressed with the thumb, sets off the shutter.

The lens is remarkable for its depth of focus, rapidity, and the angle it embraces, as will be seen from the specimen negative and prints I will pass around. In the rear of the box is the mechanism for operating the sensitive paper, which is based on the principle of the well-known roll holder, but is arranged more compactly. I have a spool of ordinary paper in the model here, and will remove the rear section for your inspection. You will observe that the winding key shank, in passing through the outer case into the end of the winding-up spool, virtually locks the rear section, after it has been pushed home; so that to get at the spool of film which has been exposed, it is only necessary to unscrew the winding key and slide out the rear section. There is also an indicator mark on the end of the measuring roll which meets a corresponding mark on the little brass thimble on the exterior of the box. After an exposure has been made the winding key is turned to the left, which winds off the exposed paper, and at the same time revolves the measuring roll. The movement is continued until the indicator mark has made one revolution with respect to the mark on the brass thimble. One exposure has thus been wound off, and a new surface presented. A round mask is in front of the paper, producing a circular negative. The paper is punctured by the measuring roll between the division of the pictures.

Only three movements are required to take a picture, and these may be made very rapidly. First, the camera is held in front of the operator, and aimed at the object to be secured; then, by clamping the left hand around the bottom, the releasing pin on the side is pressed inward with the thumb, releasing the shutter; then, after the exposure, a short pull on the winding string tightens up the shutter spring; and lastly, the paper is wound off with the key. This can be done in about a second. It is now ready for another exposure, and so on. There is nothing to get out of order, and anybody of ordinary intelligence can work it.

Of course it is necessary to operate in a systematic way if double exposures are to be avoided. To those unfamiliar with photography a card is provided having the angle of view printed on it, which may be laid on top of the box, serving as a guide to the operator. What little experience I have had with it has convinced me that the manufacturers exercised considerable common sense in dispensing with a finder. It is really unnecessary, for if the camera is held level and aimed at the object, it is sure to be caught, and this plan of working is very easily acquired.

I have found that it is quite important to hold the camera steady, for if the shutter release pin on the side is pushed inward with the finger of one hand while the camera is held in the other, there is bound to be an almost imperceptible lateral jar at the instant of exposure, which will prevent the image from being sharp. It is also advisable to take moving objects approaching or receding from you, or half side view. A broad side view is rarely distinct unless the object is moving very slowly.

Covering the aperture in the camera, in front of the lens, is a neat green felt cap for use in time exposures. In taking an interior, the shutter is released continuously until it stops rotating, then the front of the camera is pressed lightly against the clothes to exclude light, the cap removed, and the shutter turned with the finger until its aperture is opposite the lens. The cap is replaced, and the instrument is then ready. It may rest on a chair, table, or any convenient level support in one corner of a room, and an exposure of from five to twenty minutes be given according to the strength of the light.

The question will be asked, is the emulsion on the paper fast enough to make respectable instantaneous pictures? I reply that I have been most agreeably disappointed. I have made exposures at the time of day when the light was weakest—for instance, after 6 p.m. in August—and have been surprised at the amount of detail brought out. In other cases it was as late as 4 p.m., and quite cloudy; yet, contrary to my expectation, good negatives were made. These tests convince me that the film is very sensitive, and will produce some kind of a negative when there is half a chance. In connection with the camera the

Eastman Company have inaugurated on an extensive scale a system of developing and finishing up the pictures, provided the spool of exposures is sent to them, which will in time become quite an industry.

The little machine is capable of holding enough material to make a hundred pictures,  $2\frac{1}{2}$  inches in diameter. Before these are all exposed the owner may at any time take out such as have been exposed, and forward to be finished up, so that it does not follow that the one hundred must be exposed before development. At any rate, if the operator has not time to finish up the pictures, he can have the work done for him, and in the course of a few days receive back his negatives and positive prints. To the amateur who has a pride in doing all the work himself this is, perhaps, not a satisfactory method, but to the hundreds of busy men and women who know nothing about photography, and have not time to master it, but wish to take pictures when they can, the system will no doubt prove attractive, and probably encourage many to take up photography who might otherwise think it too troublesome.

After development the negative is stripped from the paper support and mounted on a gelatine skin, so that when you receive it it is transparent like glass. If the negative is sharp, it is obvious excellent enlargements may be made from it. I have a few specimen enlargements to show you. One, representing an interior, is enlarged up to five different sizes. The largest, you will observe, is twenty-seven inches in diameter, or about nine times as large as the original little negative, yet it is remarkably clear and sharp. Others show enlargements of instantaneous negatives to a foot in diameter. These clearly demonstrate that the small size of the original cannot possibly be an objection. Then, again, in the lantern slides, which are so easily made by contact, you will observe the excellent definition and sharpness of the pictures.

I am informed the lens of each instrument is very carefully tested, and is set to take objects distinct from three feet and beyond. I should mention that a very neat and tasteful leather carrying-case is provided for holding the camera when not in use.

It is needless to point out the advantages of such a useful little machine; they must be self-evident to all at all acquainted with photographic apparatus. One seems more free to make exposures, since the supply appears to be almost inexhaustible. As a device for recording incidents on a yachting, canoe, railroad, bicycle, or steamboat trip, it is most perfect in its way. A complete little book for recording the exposures is also supplied. It is certainly a satisfaction to know that we have in the United States manufacturers capable of producing apparatus so complete and unique in all its details. I commend the instrument to your attention, and will pass around some of the results of my exposures and the Company's finished work.

## SUCCESS IN PHOTOGRAPHY WITH THE FLASH-LIGHT.

BY JOHN BARTLETT.\*

It is almost an article of scientific faith with many photographers that the light which operates in producing the chemical changes by which photography is made possible, is something completely independent of the ordinary light, which produces impressions on the retina, resulting in vision. A peculiar force called actinism is said to operate in a mysterious way upon the particles of sensitive bodies; a distinct principle resident in the sunbeam, associated with light and heat, yet distinct and separate.

Now the truth is, as recent investigations have shown, and as Becquerel maintained nearly half a century ago, in opposition to the views of Draper and others, the radiations from any source of light, extending from the extreme violet to the extreme red of the spectrum, differ only in the rate and magnitude of the vibrations which are at work. The luminous, the heat and the chemical or actinic rays, are merely modes of the same force, which is nothing more than a system of vibrations. The difference between the light at one end of the spectrum and the other is analogous to the difference between notes of high and low pitch in music. If, for instance, we should accelerate the vibrations which at any time are manifest to us as red light, we should have the effect of violet; or if the violet should be retarded, we would have the phenomenon of heat-giving rays predominant. In light as in sound, there is a system of regular disturbances of

\* Read before the Photographic Society of Philadelphia.



a medium, which produces long and short, slow moving and quick moving waves.

Photography is merely a means for securing a permanent record of these disturbances. The salts of silver are so constituted that the action of the short waves, the very rapid violet undulations, is necessary, to start the molecules into a shudder or tremor. The condition of equilibrium of the silver molecules is such that a response is given at once to the impact, a resistance is offered, just as the sea waves meet resistance with the shore. The direction and velocity of the waves are affected; the molecules rearrange themselves to a new condition of equilibrium; the greater number taking up and propagating the violet wave motion, while the others file off in the line of the longer waves.

The sun is not the only source of radiation which produces chemical effect. Any substance which, when subjected to the action of intense heat, resists all tendency to conversion into vapour or gas, still remaining in a solid condition, gives, when the radiations from it are passed through a prism, a continuous spectrum similar to the sun's spectrum. There are several bodies which resist the vapour-converting action of the highest degree of heat, and give, like the sun, uninterrupted spectra. The carbon points of the electric light arc yield a pure, white light which presents a continuous spectrum from red to violet; so do incandescent magnesia, lime, and other bodies.

But the various groups of colour in these spectra are not always distributed in exactly the same proportions, as in the sun's spectrum. In some the yellow and red will predominate, in others the blue. Now, as the salts of silver are influenced chiefly by the blue rays, it follows that any incandescent solid, rich in such rays, is especially valuable in photography, although its heat-giving and light-giving rays may be less extended than in the sun's spectrum. Magnesium, when supplied with oxygen, is converted into magnesium oxide or magnesia, which is practically infusible at any temperature we can reach. It therefore gives a continuous spectrum, and although its light giving qualities are inferior to the luminosity of electric light, it is far richer in actinic rays—we use the word with caution. The light from burning magnesium, or rather incandescent magnesia, is not so intense as sunlight or electric light; a great advantage in securing soft, harmonious photographs. Bunsen and Roscoe estimated the light of the sun, as compared with incandescent magnesia, to be five hundred times as great; while the sun's actinic intensity is only thirty-six times as great.

To secure the full photographic value of the magnesium flash-light, certain conditions are necessary. Metallic magnesium, in foil or ribbon, readily takes fire and burns at the expense of the oxygen in ordinary air; but the combustion is much slower, and the magnesium-oxide is less incandescent than when the metal is finely powdered and projected into a flame. When burned in oxygen the incandescence is greatly augmented. Now, any body which supplies an abundant stock of oxygen to the metal in a prompt delivery causes a large quantity to be ignited in a short time, thereby increasing the amount of energy, and, consequently, the incandescence. It is necessary, therefore, that the energy should not be dissipated, but concentrated, so the flash may be of the shortest possible duration.

Our experiments with the powdered magnesium were begun immediately after the publication of the results of Gaedeke Miethe, of Germany, to whom belongs the honour of having first shown the great possibilities of the new magazine light. An account of the various methods employed, and the results we obtained in our endeavours to secure orthochromatic effects, would form an interesting talk. Our first trials were made according to the suggestions of Dr. Piffard, of New York, by sprinkling the powdered magnesium upon gun-cotton; but the combustion was not prompt enough, and our sitters were taken with closed eyes. The magnesium was not properly consumed, and much was wasted. The use of gun-cotton suggested collodion; we accordingly mixed powdered magnesium with chlorate of potassa, and then stirred the mixture in plain collodion until the ether and alcohol evaporated; the result was an intimate mixture of a granular character, the chlorate and the magnesia being really enclosed in little coats of the collodion. The spontaneity of the powder was much increased, and its strength also augmented. We also tried various mixtures for increasing the energy of the powder—picric acid, bi-chromates, nitrates, chlorates, &c., &c., but we very soon abandoned them, all on account of the highly dangerous and poisonous character of the combinations. We endeavoured to find a compound which, while simple in composition, should yield the greatest amount of energy when ignited. A happy accident suggested

the employment of a substance which fortunately was non-poisonous in nature, while extremely energetic in its action when combined with magnesium. We found that we could entirely dispense with chlorate of potassa, picric acid, and the other dangerous chemicals which had hitherto been employed; the resultant combination ignited with more spontaneity than any other compound we had made, and was not explosive by ordinary percussion, even when subjected to considerable friction. The powder was christened Blitz-pulver, in honour of its re-birth in Germany, the baptism being a baptism of fire. We think we can safely say that no other form of magnesium flash-light has yielded such excellent results. The views which we shall exhibit this evening were made by igniting moderate charges of the powder.

A few words as to the best means of using the light may be of interest. We generally employ the unscreened light, although certain subjects might require a diffusion of the rays by means of a gauze or ground glass; in such cases we would increase the amount of powder used. As a general rule, the point of ignition of the powder should be at a height of five feet or more, in order to cast the shadows low; but sometimes these shadows may be very effectively introduced—that is, artistically speaking. The shadows may also be prevented by placing the sitter at some distance from the background and raising the position of the light to six or seven feet from the floor.

For portraiture, the light should strike the face at about an angle of thirty or thirty-five degrees to a line drawn from the camera to the sitter. The light, if possible, should be placed slightly behind the camera, but if it is necessary to approach nearer the sitter, the lens should be shielded. The room in which the exposures are to be made, if figures are introduced, should be well illuminated with gas or lamp light, the object of which is to secure good expression in the eyes. As is well known, the pupil of the eye contracts under the stimulus of strong light, and expands in weak light. In total darkness, doubtless, it is widely expanded. Now, as the nervous response of the pupil to stimulus is less rapid than the duration of the light, it will be seen that if a photograph is taken in total darkness, the registering of the appearance will be made before the nerve has time to carry the impression over the double track from without to the brain, and back to the eye. A photograph in which the eyes are represented with widely-expanded pupils gives the sitter an owl-like expression; but when just enough light is in the room to expand the pupils a little above the normal, the expression is most beautiful and brilliant. This the gas light does, and the flash-light registers the expression.

In taking groups, be careful that the shadows of those in front do not fall upon the faces of those behind. The lighting for groups should be higher than for a single figure, and, perhaps, more directly in front.

In our first experiments we made use of silvered reflectors, but soon found that the light radiated was too strong for the shadowed face. If the paper in the room is light coloured, no reflectors are needed. If the paper is dark, reflectors of newspaper are sufficient to illuminate the side of the face turned from the source of light. The reflectors should be large, and placed at some distance, say three feet, from the face. Focussing is best done by holding a candle in front of a newspaper placed in a line with the sitter's face. When the type can be seen distinctly on the ground glass, put in the stop, and the picture will be sharp.

Few directions need be given for taking interiors. The lights can be left burning, and form part of the scene; they will not produce any flare upon the plate, provided the cap is not taken off until the instant before the powder is ignited. Interiors can also be taken in daylight, and the camera pointed directly at the windows opening upon the street. The mullions appear distinct and well-defined, and there is not a trace of halation.

The use of Blitz-pulver light for interior work not only saves a great deal of trouble and time, but, what is above all most desirable, allows the members of the family to occupy places in the picture, giving a more home-like appearance to the scene. From the absence of life in interior views there is always an impression conveyed of dreariness and desertion. The rapidity of the flash removes all constraint from the participants, and gives a naturalness to the scene which is delightful.

In taking interiors, care should be observed that the light is not reflected into the lens from mirrors, &c.; the result, of course, would be fog. In photographing still life, groups, flowers, fruit, &c., the flash-light can be successfully used; the reflections from the polished surfaces are most beautifully ren-



dered, and the whole effect is quite as fine as pictures taken in diffused daylight. Moreover, certain effects can be secured not possible by daylight; as, for instance, the appearance of steam or vapour from a foaming bowl of punch may be imitated by placing a smoking taper in the bottom of the bowl. The smoke will be caught in the quick flash, and will have all the look of steam, especially if some dark object behind it gives relief.

One of the most important applications of the flash-light is the photographing of animals. It is possible by its means to take animals at their homes—the dog or cat upon the hearth forming part of the domestic circle, giving additional interest to the scene. The flash-light has recently been employed in scientific investigations. DuBois Raymond, taking advantage of the great expansion of the pupil in total darkness, and its inability to contract instantaneously, has used with great success the flash-light in getting photographs of the interior of the human eye. Julius Sichse, of this city, has actually succeeded in photographing the visible growth of the rapid-flowering night-blooming Cereus. The series of pictures taken at short intervals, in some cases not more than five seconds apart, show the peculiar spiral motion accompanying the evolution of the flower from the bud. The actual tremor of the flower in its eagerness for development is shown in a wonderful manner. We refrain from speaking further of this novel application of the flash-light to this most interesting biological study, inasmuch as Mr. Sichse has not yet completed his investigations. He hopes shortly to continue the study, and promises to give us the benefit of his labours. The Blitz-pulver light might also be used in studying the process, segmentation in the ova of the Teredo and other low forms of animal life in which the pellicles covering the eggs are transparent. Our fellow-member, Prof. Zeckwehr, has very ingeniously used the Blitz-light to demonstrate the truth of his views concerning certain musical movements. Messrs. Rau, Harding, and Davis, of the Philadelphia Society, have succeeded in making some interesting pictures of the interior of a coal mine, in which the structure of the vein is shown with a perfection never before accomplished.

In conclusion, a word about development of flash-exposures may be needed. We prefer to keep down, in developing, the amount of pyro to the minimum, because we like soft pictures. The pyro must be diminished, especially if there is white drapery in the photograph, or hardness and violent contrast will be the result. We employ a weak developer, that is, one with considerable water, but with the alkali in slight excess. For instance, 6 ozs. water, 1 dr. pyro, 2 drs. alkali. If we find the plate slowly building up in density, we refrain from adding any more pyro; but if, after a reasonable time, it is tardy in gaining strength, we cautiously increase the amount of pyro. After detail is secured, then labour for density, but not before. A developer with excess of alkali softens the high lights, and gives the shadows and half-tones a chance; but just here judgment is necessary. The amount of alkali should not be such as to flatten the high lights; there ought to be a small area of brilliant white light in every picture which lays claim to artistic qualities.

## Patent Intelligence.

### Patents Granted in America.

389,863. JOHN BAYNES, Bronxdale, assignor of one-fourth to Lockwood De Forest, Oyster Bay, N. Y. "Photographic Apparatus."—Filed January 2nd, 1886. Serial No. 187,459. (No model.)

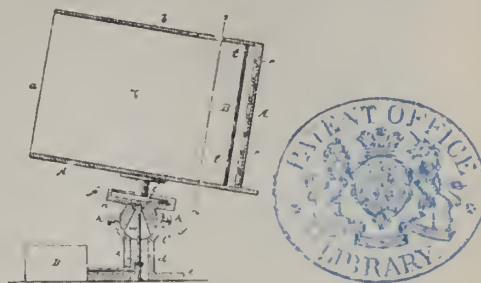
*Claim.*—1. In a photographic apparatus adapted to be used in ornamenting articles, the combination of a case consisting of an open-ended tube adapted to receive parallel rays of sunlight, a holder for the negative or pattern, or holder for the object to be acted upon situated at a distance from the negative, and means whereby the case may be held in a fixed relation to the sun's rays, substantially as described.

2. In a photographic apparatus, the combination of an open-ended case, V, a pattern-plate supported therein, and a support for the object to be acted upon, said pattern-plate and object being separated by an air-space, substantially as and for the purpose set forth.

3. The combination of a case adapted to receive the pattern-plate and an object to be acted upon, a hollow support therefor having a universal adjustment, and means, substantially such as described, passing through said hollow support and connecting

with the case, whereby it may be made to follow the apparent movement of the sun, substantially as described.

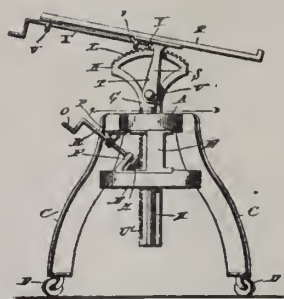
4. In a photographic apparatus, the combination of a case adapted to receive a pattern-plate and an object to be acted upon, a hollow standard provided with an expanded socket, a support in which the case is seated and having a rounded projection



fitting in said socket and a ljustable therein, means for securing the support and standard after adjustment, and a turning-shaft extending through said hollow standard and connected with the case, whereby the latter may be made to follow the apparent movement of the sun, substantially as described.

390,199. JAMES E. BLACKMORE, Grand Rapids, Mich., "Stand for Photographic Cameras."—Filed April 25th, 1888. Serial No. 271,768. (No model.)

*Claim.*—1. The combination of the supporting frame or base, the standard guided vertically therein, and having the segmental head K at its upper end provided with the rack-teeth L, the shaft M, having the worm engaging the rack-teeth on the standard G, whereby the latter may be raised and lowered, and



the platform R, having the depending arms T, pivoted to the standard, and the shaft X, journaled in bearings on the platform, and having the worm engaging the rack-teeth L, substantially as described.

2. The combination of the castings or platforms A B, having the central openings provided with the recesses in opposite sides, the standard G, guided in the said openings, and having tongues or splines engaging said recesses, said standard being provided with the rack-teeth l, and having the segmental head K at its upper end provided with rack-teeth L, shaft M, journaled in suitable bearings and having the worm engaging the teeth I, the platform R, having the depending arms T, pivoted to the upper end of the standard, whereby said platform may be inclined to any desired angle, and the shaft X, journaled in suitable bearings attached to the platform, and having the worm engaging the rack-teeth L, substantially as described.

3. The supporting-frame or base, in combination with the standard vertically adjustable therein, the rack-teeth L on the standard, the platform R, pivoted to the standard, and the shaft X, fitted to the platform, and having the worm engaging the rack-teeth L, as set forth.

## Correspondence.

### ISOCHROMATIC PHOTOGRAPHY.

SIR,—Will you allow us to state, in answer to your note which appears at the foot of our letter in your last week's issue, that the blue colour of our isochromatic model, which you describe as "blue-black," is simply a mixture



of ultramarine and Prussian blue, without a particle of black in its composition.

We do not in the least know your editorial ideas of fairness in colours, as no two people see colours exactly alike. The one used in the model, although what we should call an intense blue, is no exception to the rule common to this colour, inasmuch as on ordinary plates it photographs as light or lighter than the chrome-yellow ground with which it is associated. It is only when an isochromatic plate is used that the blue appears darker and the yellow lighter, or the visual and photographic value of the two colours become nearly equal.

The difference in the rendering of the two colours is, perhaps, even still more marked in the photographs which we sent you of natural flowers—viz, yellow and violet pansies—about the colour of which (we are pleased to note) no suggestion of unfairness is made, although the objection would equally apply in this instance.—Yours truly,

B. J. EDWARDS & Co.

*The Grove, Hackney, October 23rd.*

[Our note of last week, with respect to what we look on as an unfair sample of blue, is as follows:—"We regard the blue of the 'isochromatic model' sent by our correspondents rather as what is generally called a 'blue-black,' than as 'blue' without any qualification; in other words, we do not regard it as a fair sample of blue."—Ed. P.N.]

#### DEBENHAM'S ARTICLES ON RETOUCHING.

SIR,—I notice a mistake in one of the figures in the formula for retouching medium given on page 660, second column, eight lines from the bottom. It should read 3 ounces of resin, not 1 ounce, to 18 ounces of turpentine and 1 of balsam of copaiba.—I am, yours obediently,

W. E. DEBENHAM.

### Proceedings of Societies.

#### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE monthly technical meeting of this Society was, in accordance with the custom which has obtained during the continuance of previous exhibitions, devoted to explanation of the apparatus shown therein.

The chair was occupied by H. TRUMAN WOOD, who, before the commencement of the customary proceedings, referred in feeling terms to the loss which he feared there was no doubt the Society had sustained in the person of its Hon. Secretary, W. F. Donkin. He was, the Chairman observed, a rare man, who could hardly be said to have an enemy. He believed that, in the opinion of experienced travellers and mountaineers, there was no rashness in the expedition in which Donkin had been engaged, and that not the slightest blame could be attributed to him on that ground. The expedition had not been undertaken for mere sport, but had been intended to have useful results. He thought it right to express the very deep feeling which he felt for the fate which he feared, beyond room for hope, had overtaken their Hon. Secretary.

After a unanimous expression of sympathy, the business of the meeting was proceeded with. As only two or three of the exhibitors had, on this occasion, thought proper to appear to explain their exhibits, this duty was, for the most part, fulfilled by the attendant who had the charge of the apparatus during the exhibition.

J. R. GOTZ, however, being present, showed his camera in connection with which he had introduced certain improvements since it had been shown before. A front was fitted for a pair of stereoscopic lenses, and there was a means for adjusting the distance between them by a pin working in slots. The lenses were thus simultaneously separated or approached without thickening the front, as rackwork would have done. The division at the back was made to turn upon a pivot, so that it might either be used at right angles to the back when a stereoscopic picture was being exposed; or folded alternately over either half of the plate if it was desired to take separate pictures upon the two halves. Both division and front were removable, so that the camera was available for a single picture of a larger size. A stand was

also shown, the novelties in which consisted in the method of securing rigidity at any height to which it might be opened. The stand was of the sliding kind, divided into three sections, and was adjustable at heights of from two feet to that of rather a high stand. For fixing rigidly there were sliding stirrups with tightening screws, and in the inner leg was a sliding block, which, placed in position level with the tightening stirrup, offered a firm support, neutralizing at that point the spring of the wood.

G. F. SNEW showed a box adapted as a camera front for holding a small negative, or transparency, from which it might be required to make an enlargement. At one end of the box was a short tube adapter, which screwed into the flange on the camera; whilst the inside of the adapter was screwed to fit the thread on the back of the lens intended to be used with it. The lens might thus be screwed either way into the adapter, so as to present its back surface in which direction might be required. The box was double, one part sliding in another, so as to allow adjustment for distance, as with a sliding-bodied camera. The front of the box was fitted with grooves to receive a quarter-plate dark slide, and had a lateral motion to allow of a particular part of the negative being placed opposite to the lens. For focussing, the exhibitor preferred to use a plate which had been converted into a negative, showing merely two fine clear lines crossing one another. When focussed, the transparency was placed in the same position as that occupied by the cross-line negative. The camera in which the appliance was shown was a whole-plate one, and if it was desired to reduce instead of to enlarge, was equally available for the purpose. A tilting-board for attachment to the top of camera stand was also shown, by means of which the instrument could be pointed to the sky and firmly fixed. The same exhibitor also showed a revolving front for use with his detective camera, by the use of which a rising arrangement could be secured in either direction without increase of bulk. He further explained Thornton's camera with McKellan's front adapted to it, and slides and front secured by spring catches instead of the customary grooves; also a set of measures nested and fitted into travelling case. The markings on the measures were ground more deeply than usual, and filled in with opaque white, so as to be more easily visible in the light of the developing room. He also showed a ball-and-socket clip for attaching a camera to a tricycle bar.

The CHAIRMAN thought it desirable to have a spirit level attached to the camera, in order to ensure its being horizontal.

T. SAMUELS exhibited his changing-box, and the attendant then showed the various exhibits that had been sent by Parks, Hintou, Sands and Hunter, the Eastman Company, Collins, James, Marion and Co., Gale, Perkins and Raymont, and Wrench. The exhibit by James comprised a flash lamp which has been previously described, in conjunction with a smoke trap for removing the product of the combustion of the magnesium. This trap consisted of a bellows-box carried on a stand and placed at a little height above the flash. The strength of the blast used forces the fumes into the box, the open lower end of which is then closed, and the box being removed from its stand is carried into the outer air to be emptied of its fumes.

After a few remarks by the Chairman, the meeting adjourned.

#### NORTH LONDON PHOTOGRAPHIC SOCIETY.

AN ordinary meeting was held on October 16th, J. TRAILL TAYLOR in the chair.

James Syrus Tulley and John Warwick Wharton were elected members of the Society.

The PRESIDENT said that as the present was the last meeting before the annual general one, the office-bearers for the coming year would have to be nominated.

Messrs. Douglas and Cossor were elected Auditors.

Mr. Cossor exhibited two large lenses about twelve inches in diameter, and asked for what purpose they had been made.

The PRESIDENT said that, judging by the length of the focus—about thirty inches—they had probably been used as cosmorama or peepshow glasses.

John Jackson passed round a number of fine negatives taken on stripping films in the neighbourhood of Bristol.

F. W. COX showed several excellent figure subjects in platinotype.

L. MEDLAND showed an interesting group of the keepers at the Zoological Gardens, and drew attention to the fact that all the sitters had kept perfectly steady.

J. OAKLEY asked if any of the members had tried the Apts



paper. He had found it simple in manipulation, and giving pleasant warm tones. The specimens shown had simply been fixed, no toning or development being necessary.

Rev. E. HEALY had used the paper in question, and liked the tones obtained; he found it very slow in printing—in some cases, four hours in a fair light being necessary to get a print off an ordinary negative.

F. G. READER showed several interesting pictures taken in the neighbourhood of Leatherhead.

The discussion on "Home Portraiture" was postponed until the second meeting in November.

The annual meeting will be held on November 7th, at 8 p.m.

#### GLASGOW PHOTOGRAPHIC ASSOCIATION.

THE first meeting of the session was held on the 11th instant, for the purpose of electing office-bearers and making the arrangements for the winter's meetings. WILLIAM LANG, jun., occupied the chair.

Mr. LANG opened the meeting with a *resumé* of the past session's work, which was followed by a discussion regarding the place of meeting, &c.

The following office-bearers were then elected:—

*Chairman*—William Lang, jun., F.C.S.

*Vice-Chairmen*—R. Dodd and A. Robertson.

*Council*—T. N. Armstrong, W. Brown, G. Mason, A. Mactear, W. J. McIlwrick, and J. Urie, jun.

*Treasurer*—G. B. H. *Secretary*—J. Craig Annan.

A vote of thanks was awarded to the retiring Secretary, Daniel Robertson, for the work he had done on behalf of the Association during the three years he had held office. Mr. Lang was also thanked for the services he had rendered as Chairman during the same period.

A number of books illustrated by the various photographic processes were exhibited by Mr. Lang, and that which attracted most attention was a volume entitled "Treasure Spots of the World," published by Mr. Woodbury, 1875. Among the other works on the table were Elder's "Ausführliches Handbuch der Photographie," Wilkinson's "Photo-Engraving," and Anthony's "International Annual."

#### CAMERA CLUB.

On the 18th inst. the first of the monthly lantern exhibition was held. There was a good attendance, and a very great variety of work was shown, much of it quite new. The slides put through the lantern were the work of twelve exhibitors, and comprised subjects as follows:—Landscape and river subjects, on Fry's gelatine bromide transparency plates, by Mr. Barclay (a good many of these slides were from negatives taken on club excursions); copies of Furniss's cartoons in *Punch*, by Mr. Corbould, on Mawson's lantern plates; illustrations of the works at the Forth Bridge shown by Mr. Elder; landscape and interiors, by J. B. B. Wellington, on collodion-bromide plates; instantaneous views of bicycle racing, on wet collodion slides, from negatives taken by Mr. Shipton in his hand camera; landscape work, by Mr. Lane; views of the college at Cambridge and other club excursion work, by W. M. Robertson and by F. Howlett; figure subject, by Mr. Davison, on Thomas's new lantern plates; pictures of London streets, taken by Mr. England in his Shew's hand camera, some of the slides being on rapid chloride plates; flower and figure subjects, on Mawson's lantern plates, by Henry Stevens; views in the Dauphiné taken by W. A. Greene, also in a Shew's hand camera, on Eastman's stripping films; and a dozen landscape with figures subjects, on wet collodion plates, by Mr. Gale.

Altogether about 140 slides were shown—one of the most varied collections that could possibly be brought together. Some of Mr. Wellington's slides were magnificent in quality and colour; those shown by Mr. Elder were of great interest; Mr. Corbould's subjects afforded amusement; Messrs. England's, Shipton's, and Greene's added a special photographic interest on account of the process. Mr. Greene's pictures were, further, very pictorial, as also many of those by Messrs. Howlett, Robertson, and Barclay.

On Thursday, November 1st, the subject for discussion will be "Toning," in reference both to bromide and silver papers. A paper will be read by H. M. Elder, M.A. Meeting at 8 p.m.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The usual weekly meeting was held on the 18th inst.

F. W. Cox exhibited some platinum prints.

A question from the box was read:—"In what condition

should carbon tissue be to enable it to be properly stripped from glass that has previously been collodionised and polished with talc?"

A. COWAN said it might be stripped the following morning. He recommended that the glass should be polished with bees-wax and turps, and afterwards polished with talc.

J. B. B. WELLINGTON said if the tissue was allowed to get too dry it would not strip.

W. H. HARRISON would use, to ensure the surface of the glass being thoroughly clean, sulphuric acid and bichromate of potash, as recommended by Carey Lea.

A. HADDON remarked upon the free alkali always present upon the surface of freshly made glass; distilled water kept in a newly made glass vessel would be found to be contaminated. A German physicist had recommended that the vessel should be boiled in order to dissolve out the alkali.

J. T. COLLINS exhibited a 15 by 12 camera; it racked out to thirty-three inches, and combined all the most useful movements, including a small brass plumb-bob attached to the side of the camera, by which the vertical position of the back was insured.

The HON. SECRETARY read out a notice he had received referring to the forthcoming exhibition at Florence.

J. J. BRIGGS referred to the favourable comments in the daily papers upon the English photographic section at the Vienna Exhibition.

A. HADDON said at the last meeting a question was asked why plates, enclosed in a drying-box in which was deposited chloride of calcium, should commence to dry at the top of the box first, the chloride of calcium being at the bottom. This seemed difficult of explanation at first sight. It, however, was in obedience to ordinary natural laws. Air deprived of moisture becomes lighter, and ascends; and again, at the instant of contact of aqueous vapour with the chloride of calcium, latent heat is given out. The temperature of the air being raised, it rises to the top of the box; currents of warm and dry air combined are thus circulated over the top plates, causing them to dry quicker than the plates in the lower parts of the box. A. Haddon said he had based his remarks upon experiment. Air saturated with moisture was blown through a tube containing chloride of calcium; immediately the air came in contact with the calcium the mercury of a thermometer placed in the tube was seen to rise.

J. BELLSMITH, of New York, a visitor, was introduced to the members. Referring to photography in America, he remarked, that in the States photographers were principally composed of two classes, theorists and experimentalists; or those who read much and did little practical work, and others who did a great deal of work, but read very little. To be a successful photographer one must do both. Mr. Bellsmith then spoke of the value of photographic societies, remarking that no one, however advanced in any profession or pursuit, but might profit by hearing the opinions of others.

The HON. SECRETARY announced that the second Thursday in each month would be set apart for the optical lantern.

J. Webster was elected a member of the Association.

#### PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A MEETING of the Society was held on October 3rd, with Vice-President JOHN G. BULLOCK in the chair.

The paper for the evening was read by J. BARTLETT, on "The Successful Use of Flash-Light Compounds in Photography" (see page 683).

S. M. FOX thought that a common mistake in flash-light photography was uncapping the lens too soon. This should be done only an instant before igniting the powder, otherwise the light of burning lamps, &c., was unduly impressed on the plate. He mentioned a case in which a lighted lamp which had been used as an aid in focussing, was carried across the room after the cap was removed, the result being a streak of light on the plate.

Mr. STIRLING recommended the use of a double pneumatic exposing and igniting apparatus, one bulb and tube opening the lens an instant before the other ignited the powder.

W. H. RAU advocated the use of large charges of powder to give plenty of light, particularly with interiors or for dark drapery.

Mr. SUPPLEE said the same rules should govern as with daylight exposures, bearing in mind that with a group requiring the camera to be at a greater distance than with a single figure if the distance was doubled, the exposure should be quadrupled, con-



sequently four times the amount of powder would be required, other things being equal.

Dr. CHARLES A. OLIVER stated that there was one point in Mr. Bartlett's paper to which he desired to take exception, and that was that the foreign observers had obtained successful results in retinal photography. Upon account of the convex surface of the anterior portion of the eye, there was in all of the results so far obtained, so great a reflex that the picture gave nothing more than a vague idea of the fundus of the eye, associated with a large cone-like light-streak. He had been working at the subject for more than two years, and had found the greatest trials in constructing a fixed apparatus. The corneal reflex he thought he had at last conquered by the adoption of suitable lenses. As soon as practicable, he would, in connection with Dr. Wharton Sinkler, read a short paper before the Society upon the subject.

Mr. Carbutt showed a negative made on an orthochromatic plate taken from a package prepared and packed just one year ago. The plate had every appearance of one freshly prepared, the time which it had been kept having had no deleterious effect upon it.

#### SHAFESBURY PHOTOGRAPHIC SOCIETY.

THE usual weekly meeting was held at the Craven Lecture Hall, Joubert's Place, Regent Street, on October 19, when G. A. E. ROBINSON occupied the chair.

NEWMAN BAKER read a paper on "My Experience as an Amateur Photographer." Several pictures were shown illustrating his gradual progress; his first quarter-plate view causing much amusement.

T. HARRISON advocated the use of an exposure-book, and described his contrivance for an enlarging apparatus, and mentioned that he found negatives which gave bad silver prints, very often gave good bromide prints.

R. SAMORA liked Mr. Harrison's idea for an enlarging apparatus, and remarked that one thought more of a result obtained from a machine of an amateur's making, than that obtained by a more costly apparatus.

Two new members were duly enrolled.

Particulars, &c., may be obtained of John B. Rintoul, hon. sec., 36, Brewer Street, Regent Street, W.

### Talk in the Studio.

FRY AND COMPANY'S DRY PLATE COMPETITION.—An extensive competition, organised by Fry and Co., for negatives taken on their plates, has resulted in the following awards. *Prize List.*—1st Prize (£20), Thomas G. White, Bank Street, Carlisle; 2nd (£10 10s.), W. D. Welford, 47, Hagley Road, Edgbaston, Birmingham; 3rd (£5 5s.), James Russell and Sons, 23, Hill Road, Wimbledon; 4th (£3 3s.), W. Wainwright, Hoe Place, Woking; 5th (£3 3s.), Rev. H. B. Hare, Great Elm Rectory, Frome, Somerset; 6th (£3 3s.), Thomas H. M. Colledge, Rosemount, Selkirk; 7th (£2 2s.), Jno. Phillips, 46, Fairfield Road, Bristol; 8th (£2 2s.), Dr. Drew, Alexandria, via Grahamstown, South Africa; 9th (£2 2s.), W. Norgrove, Wortley Villa, Kingsley Road, Cotham, Bristol; 10th (£2 2s.), H. Dudley Arnott, High Street, Gorleston, Great Yarmouth; 11th (£2 2s.), W. A. Firth, Springfield Road, Belfast; 12th (£1 1s.), C. W. Smartt, 54, Parade, Leamington, Spa; 13th (£1 1s.), Dr. W. Richardson, Ruth Lodge, Oxford Street, Reading; 14th (£1 1s.), R. Lockhart, 9, Woodburn Terrace, Edinburgh; 15th (£1 1s.), W. C. Hemmons, 8, Berkeley Square, Clifton; 16th (£1 1s.), Rev. F. C. Lambert, 62, St. Andrew's Street, Cambridge. In all, nearly 1,000 negatives and prints were sent in for competition; every negative bearing only a number in order of rotation as received, and without any other means of identification.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.—The Photographic Society of Great Britain having kindly placed their Exhibition at the disposal of the Benevolent Association for the evening of November 9th, the committee desire to solicit assistance of photographers in purchasing the tickets either before the day or on the evening. Remittance for tickets can be sent to the Secretary, 181, Aldersgate Street, London.

LITERARY PHOTOGRAPHIC CLUB, FOUNDED 1887, AND THE POSTAL PHOTOGRAPHIC CLUB, FOUNDED 1886.—The Literary Photographic Club was established for the circulation and exchange of photographs of literary interest, or of places connected with

eminent persons, and the circulation is to commence on the first of March and the first of September in each year. Each member keeps the prints one week, and then forwards them to the next member on the list. The prints to be circulated must be sent to the Hon. Sec. a short time before the day on which the circulation commences. A manuscript book accompanies the prints, in which notes are inserted and exchanges effected. Hon. Sec.: R. A. R. Bennett, Walton Manor Lodge, Oxford. The Postal Photographic Club was the forerunner of several postal photographic clubs and circulating albums now in existence. It was founded for the circulation of prints taken by the members. These are submitted to the criticism of the Club, and advice given as to their improvement. Exchanges are also made by agreement. The prints are circulated in a box, which passes from member to member, each retaining it two days. A manuscript book is enclosed with the prints, in which queries and answers are written, and discussions take place on various topics connected with photography. The rules are few in number and easily kept. The subscription is sixpence per annum, and the cost of forwarding the box averages sixpence and sevenpence halfpenny monthly. Number of members not to exceed twenty. Hon. Sec., R. A. R. Bennett, Walton Manor Lodge, Oxford.

PHOTOGRAPHIC CLUB.—The subject for discussion on Oct. 31st will be "Lantern Matters," preceded by a short paper by E. W. Foxlee on "A Simple Method of Testing Photographic Mounts." This is a lantern night, and visitors are invited.

### To Correspondents.

\*. Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER AND CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

W. V. MORRIS.—1. There is no objection whatever to using the rapid doublet for the purpose, on any plate it will cover; but we have not met with a rapid doublet of 7 inches focus which would cover a 12 by 10 plate. 2. There are several single solution developers in use, one of the commonest being the ferrous oxalate developer. 3. Dissolve 300 grammes of oxalate of potassium in 500 grammes (i.e., 500 cubic centimetres) of water, and when the solution is nearly cold dissolve therein 100 grammes of ferrous sulphate. For use, this developer generally requires dilution with its own bulk, or double its bulk of water.

MERCURY.—1. Burton's book is published by Marion & Co., of Soho Square. 2. The book in question will probably give you sufficient information.

DR. VOGEL.—We are obliged for both your communications, which were not in time for our present issue.

HERMANN FLEURY.—Some time ago we saw them in the shop window of Mrs. Evans, 4A, Duncannon Street, London, but cannot say whether they are still to be had.

BROMIDE.—The very best hypo eliminator is plenty of washing, and even after using such hypo eliminators as hypochlorites—and these are the only effectual ones—nearly as much washing is needed to remove the eliminator. Imperfect removal of the hypochlorite causes the paper to rot, and in the ordinary methods of paper-making hypo-sulphite of soda is used to eliminate the hypochlorites used in bleaching. Hence the frequent presence of hyposulphites in mounting boards.

T. HUSS.—Considering everything, we think the prospects are less favourable than in this country.

LIGHT.—The magnesium flash-light, if properly used. Several articles on the subject have appeared lately in the PHOTOGRAPHIC NEWS.

ENQUIRER.—1. The spots on the negative are due to silver from the paper acting upon and entering into the film at certain points. The drier the paper used for printing upon, the smaller is the chance of this happening. 2. The spots on the print are due to imperfect fixation, but they only occur where there are hard nodules of albumen which retain the silver, so in one sense they are due to a defect of the albumenised paper.

STERLING COYNE.—You can perhaps, obtain it from Hopkins and Williams, operative chemists, Cross Street, Hutton Garden, London.

J. HAINES.—1. The ordinary oil colours sold in tubes at most fancy material stores answer well. Those of Rowney or Winsor and Newton can be obtained almost anywhere. 2. We will post you a book containing the required information.

G. BRADFORD.—To hand. Thank you.

P. SWANSON.—Thank you for the article for the YEAR-BOOK. 2. See a small book on "Photographic Painting," by A. H. Bool, and published at one shilling by Piper and Carter, 5, FURNIVAL STREET, HOLBORN, E.C. 3. Try gum elemi.

R. BLACKMAN.—We will post you the particulars.



# THE PHOTOGRAPHIC NEWS.

Vol. XXXII. No. 1574.—November 2, 1888.

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### THE CASE OF A HOSPITAL INTERFERING WITH A PHOTOGRAPHIC BUSINESS—RESULT OF THE APPEAL.

In May last we gave a report of the case of *Tod-Healy v. Benham*, in which the landlord of 7 and 8, Gloucester Terrace, Brompton Road, in conjunction with Elliot and Fry, photographers, moved to restrain Dr. Benham, the projector of the Queen's Jubilee Hospital, from using No. 6, Gloucester Terrace, in such a way as to cause a nuisance. The Judge decided against the Hospital, and Dr. Benham appealed. On Saturday last the appeal came on for hearing before Lords Justices Cotton, Lindley, and Bowen, sitting in the Appeal Court.

The Lords Justices now adopted the view of the first Judge (Justice Kekewich), that the business was an annoyance within the meaning of the covenant in the lease, and confirmed his decision, dismissing the appeal, suspending the operation of the injunction for a fortnight.

The Secretary of the Hospital informs the Press, that in consequence of the decision of the Court of Appeal in this case, arrangements have been made to carry on the Hospital in suitable premises close at hand.

It may be noted as an interesting legal point that the verdict was not given on the question as to whether a nuisance was caused, but whether using the building as a hospital was a breach of covenant of the lease. To prove this the ground-landlord was a co-plaintiff with Elliot and Fry. Photographers, therefore, who suffer from any injury to their business caused by their next door neighbours, must not rely upon this case as a safe precedent.

### PHOTOGRAPHIC EXHIBITION AT GENEVA.

(FROM A CORRESPONDENT.)

THE Photographic Exhibition promoted by the Geneva Photographic Society opened on the 6th October, and remains open for a month. The photographs are hung in a large room in the Electoral Buildings, and are well lighted from above. This, the second exhibition of the Geneva Society, has proved so very successful that their next venture will probably assume an international character. The exhibits were judged by a jury who awarded diplomas of equal value to those exhibitors whose work was, in their opinion, the most meritorious.

The following received diplomas, and are specially noteworthy:—

Dr. H. Fol, two good enlargements of mountain scenery on bromide paper; a large Medusa, swimming in salt water, rather larger than life-size; Star Fish (*Astropecten*) mouth side, alive, enlarged 25 times; Stenophore (*Beroe*) alive, swimming in salt water, enlarged 10 times; Diatom (*Arachnodiscus*) enlarged 9,200

times. All on bromide paper, and exceedingly well executed.

Coombe Williams, six small pictures printed in platinum, all most artistic and of good technique. Two of these, "The Harvesters" and "Gathering Narcissus," are specially excellent.

Edgar Sautter, three frames crowded with quarter-plate instantaneous pictures, taken with Marion's reporter's camera.

Ed. V. Boissonnas, various specimens of orthochromatic results, compared with those obtained on ordinary plates, from negatives on plates made by the exhibitor.

A. Eternod, a large exhibit of a new Universal Camera for ordinary, scientific, and microscopic photography, medical photographs, and an album of views.

F. De l'Harpe; amongst this gentleman's exhibits is a ploughing picture which has a lot of "go" in it.

M. Van Berchem, small views and enlargements, worthy of Egyptian subjects.

Lacombe and Fils, show-case portraits; but one photo-engraving of a girl looking out to sea is very charming.

F. Boissonnas, the largest exhibitor, and his work throughout of high standard, an enlargement of an Alpine scene with snow-clad mountain in the distance, is especially fine (Valley of Zermat, La Cervin), the negative being on an orthochromatic plate; La Batie sur Versoix is another charming enlargement on bromide paper; a crowded frame of landscapes containing two good boat pictures; a large frame of views taken on orthochromatic plates; another frame of prints from Eastman paper negatives, a little picture of Goats, taken at L'Hermitage near Hyères, being especially charming; and numerous studio portraits of children, for which Mr. Boissonnas is so justly famed.

H. Racine, frames terribly over-crowded with good silver prints of cabinet-size views and instantaneous studies, Algerian donkeys carrying sand, being quite a picture, and technically excellent.

J. Kolla, horses in motion and military scenes, some very clever.

There is also a good show of results obtained by various photo. printing processes, apparatus of various kinds, and photographic chemicals and preparations, amongst the exhibitors of which several diplomas were awarded.

### ON COLOUR SENSITIVE PHOTOGRAPHY AND OPTICAL SENSITIZERS.

BY DR. H. W. VOGEL.\*

I LEARN from English newspapers that colour-sensitive-ness calls for more and more the attention of English

\* I say Colour-Sensitive because the words "orthochromatic" (right in colours), or "isochromatic" (equal in colours), do not signify rightly either the process or the sensitiveness of the plates prepared after it for different coloured rays.



photographers. But whilst in Germany colour sensitive processes have been introduced into practice for five years, it seems that in England the matter still interests only from a theoretical point of view.

In illustrating this opinion, I will only mention that our chief photographic reproduction establishments in Germany—*i.e.*, Haufstangl and Bruckmann, Munich; Photographische Gesellschaft, Berlin; Braun in Dornach—have taken with colour-sensitive collodion or colour-sensitive gelatine plates many thousands of old and new oil pictures, not only on the Continent, but also in England; and whilst in Germany in the last season in landscape photography were consumed more than 20,000 eosine of silver plates, the *Morning Advertiser*, speaking of the Photographic Exhibition in Pall Mall, says of the exhibited landscape pictures taken on those plates: "The new process promises very fine results hereafter, but whether it will come into general use remains to be seen."

In the articles published in the last season on colour-sensitive (the so-called ortho, or isochromatic) photography, my "theory" is often mentioned and criticised sometimes in such a manner that I fear the authors have not understood rightly the meaning of my sentences. Therefore I am much indebted to Mr. Bothamley, that he has rectified at the Birmingham Congress several of the assertions imputed to me, and has pointed out that it is a mistake to criticise the assertions of an author after imperfect translations, and not after his original publications. The chief objections seem to have arisen from the name I have given to the dyes which sensitize photographic plates for yellow, red, and green rays, &c.; that is, optical sensitizers. Mr. Bothamley proposes another name (selective sensitizers), but I think I have good reason for calling the mentioned dyes optical sensitizers. The name is founded on experiments with collodion-bromide of silver plates, prepared with an excess of soluble bromide, and washed thoroughly afterwards.

The following facts must be kept in mind:—

1. If a chemical sensitizer (*i.e.*, tannin) is applied to such plates it increases their general sensitiveness for white light very much; if a merely\* optical sensitizer is applied to such plates it has no action at all. This is a very marked difference.

2. The action of the so-called optical sensitizer on a collodion and bromide of silver plate is only visible if it is prepared with an excess of nitrate of silver, or any other chemical sensitizer, as tannin, morphia, &c.

3. Whilst chemical sensitizers increase the sensitiveness of the mentioned plate (1) for white light in general, optical sensitizers increase only the sensitiveness for those rays which they optically absorb.

I call the first class of sensitizers "chemical" ones because they combine chemically with iodine and bromide, liberated by the action of light on iodide and bromide of silver, and because they help in this way the chemical action of light. I call the second class of sensitizers "optical" ones because they sensitize only for those rays they optically absorb; and because the optical absorption is the first reason of their sensitizing power. I think in this sentence is no theory at all, but real facts, first observed by me; and I guess that I have a good right to make the separation of the two kinds of sensitizers, and to maintain the name I have given, "optical sensitizers."

But others think that these facts I have pointed out are the explanation of them; and here I differ from Captain Abney. He gives several facts; *i.e.*, he shows that cyanine and erythrosine are decomposed by the rays they absorb, and that the decomposed or reduced bodies act *secondary* on the salts of silver in the dyed bromide of chloride of silver plate. I acknowledge this fact, but not the conclusions drawn from it, because other facts cannot be explained in this way.

Remember, firstly, the fact No. 2 above mentioned.

\* I say "merely," because I have pointed out already (1876) that it may happen that any body sensitizes not only chemically, but also optically.

Magdala red, for instance, does not sensitize collodion-bromide of silver for yellow rays, if a trace of soluble bromide is present, but it sensitizes very well in the presence of a trace of nitrate of silver.

Captain Abney explains this fact by another fact: that the developing action of the dye (I guess he means the body formed by the exposure of the dye) is retarded "by the presence of a trace of soluble bromide." But here Captain Abney has left out the consideration of the other fact observed by me, that in the presence of morphia or tannin, the Magdala acts very well sensitizing for the yellow rays, even if the bromide of silver is prepared with an excess of soluble bromide.

Now I ask modestly, how will Captain Abney explain this fact? Will he suppose that bromide of silver (prepared with excess of soluble bromide) is more easily reduced by the exposed dyes in the dark room if tannin is present? I say tannin or morphia in the dark has no action at all on bromide of silver. Captain Abney may cover his exposed plain collodion film, dyed with Fuchsin or Magdala red, with collodion emulsion (prepared with excess of soluble bromide) and treated with tannin or morphia; he will get no action at all by development. The presence of tannin and other chemical sensitizers helps only the action of Magdala red or other optical sensitizers if both are together exposed with the bromide of silver.

Another fact is, that bromide of silver (with excess of nitrate of silver) mixed with a sensitizing colour (*i.e.*, chinolin red or eosine), and exposed to light will give an action of the yellow part of the sun's spectrum even in a second; but if one would get an action after Abney's system, by exposing a plain collodion film coloured with the dye, and covering in the dark room with emulsion and developing, he must expose the plain collodion film about twenty times as long, to get the same action as if the dye were mixed with the bromide of silver, and exposed together with it to the light.

Captain Abney will reject this objection. He says, "the slightest exposure to light begins to change the dye."\* But that is not the case if the dye is exposed *per se*. It is only the case if the dye† is exposed in the presence of bromide of silver.

From this fact I conclude that there is a very marked difference between the behaviour of the dye if it is exposed *per se*, and afterwards brought in contact with bromide or chloride of silver; or if it is exposed together with the last-mentioned silver salts. In the latter case, the action of the dye is by far more intense, and even visible (in the presence of a chemical sensitizer) if the bromide of silver is prepared with an excess of bromide.

Perhaps Captain Abney will explain that by the theory of the "status nascens." But what is "status nascens?" Under "status nascens," the fact is understood, that certain bodies act, by far, more energetically in the moment they are liberated from a chemical compound, than in a free state. So it may happen that the bodies formed from the dyes by the action of light, reduce silver salts more easily in the moment of formation than afterwards.

Now I go a step further, and explain the fact of status nascens. If any body is decomposed chemically by light or heat (which is generally the same) the body vibrates. If the vibration is very strong, the chemical equilibrium is disturbed, the body decomposed, and the new bodies formed or liberated are in a condition of energetic vibration which will make them apt to decompose other present bodies by the communication of their vibrations.

I think in this way Captain Abney and I come together.

\* *British Journal*, p. 197.

† I have exposed a gelatine plate dyed with eosin, and have got with it, even in instantaneous exposure, pictures of the sun spectrum with very marked action in yellow. Further, I have dissolved eosine in plain collodion, exposed to the sun's spectrum for twenty-five seconds, afterwards covered with gelatine emulsion and developed, and I have got nothing at all. The same was the case as I coated a gelatine plate with the dyed collodion and exposed (after Abney's method).



The action of the exposed dyes is by far more energetic, if they are exposed together with bromide of silver, than if they are exposed alone. This fact Captain Abney will not deny I believe. And, perhaps, he will now give more credit to my explanation, that the light absorbed by the dye is transmitted in vibrations, partly in slow ones (heat), partly in quicker ones which will induce chemical decomposition. But not only the dye, but also the silver salt absorbs rays, and begins to vibrate. This vibration is a feeble one in the yellow part of the spectrum if silver salt is alone; but in the presence of a dye the energetic vibrations of the latter are communicated to the molecules of bromide of silver which are in contact with them, and therefore the bromide of silver is brought into such energetic vibrations that their chemical equilibrium is disturbed, *i.e.*, the salt is decomposed. This happens best when a body is present which will combine with bromine or iodine—that is a chemical sensitizer. So I explain the fact that optical sensitizers, in the case of collodion bromide of silver only works if a chemical sensitizer is present. This short explanation may be sufficient to clearing up the matter.

In addition to this, allow me to rectify Captain Abney in another matter. He says, in a note on page 216 of the *British Journal of Photography*:—"On August 5, 1884, I wrote to the PHOTOGRAPHIC NEWS. . . . In the same communication I showed how to add eosine of silver to a gelatine emulsion. I make this note here, as the mixture has been subsequently recommended." I call attention to the fact that I published a method how to add eosine of silver to a gelatine emulsion three months before Captain Abney, on page 51 in the second May issue of the *Photographische Mittheilungen*.

Berlin, October 29th, 1888.

## CHAPTERS ON ELEMENTARY PHOTOGRAPHY— A GUIDE TO BEGINNERS.

BY W. M. ASHMAN.

### ELEVENTH ARTICLE.

It is probable that the majority of beginners who have not the benefit of personal instruction from an experienced teacher, commence the practice of photography by attempting to portray some familiar subject situated in or near their own dwellings; and when difficulties connected with the management of the new apparatus have been mastered, a wider field of action is chosen. The delineating of house pets, family groups, and numerous other subjects, differing, as regards the treatment required, from buildings, open landscapes, and general views, may be practised with a moderate degree of success; but touring with the camera is by far a more pleasant occupation, and the probabilities are that proportionately better results will be obtained.

On the other hand, it must be said that pictures of considerable merit have been shown at exhibitions by those favoured with opportunity, and possessed of perseverance to overcome obstacles. "Strengthening the Understanding," a picture greatly praised at the Photographic Society of Great Britain Exhibition held at Pall Mall a year or two ago, is a good illustration. No one will deny that this example of photography was a true work of art, created from the most ordinary materials, namely, a figure subject, an untidily attired old man, and a few shoe-mending implements distributed about the photographer's printing-room. The sitter and the accessories were, it is stated, taken separately, and united in one harmonious picture in the process of printing. Another photograph in the same exhibition, entitled "Only for My Ears," was also a success. The arrangement was simple, but effective, and comprised two figure subjects—a letter carrier and a country lass. Pictures possessing equal merit can be made every day. It must, however, be borne in mind that the production of such work necessitates, in addition to opportunity and the command of suitable instruments, the cul-

tivation of the perceptive faculties to an especial degree, and the possession of considerable artistic taste and skill.

Home pictures, illustrative of some incident or other that may transpire in everyday life, are by no means an easy task for a beginner to attempt, for it seldom happens, except in the more expensive class of outfits, that the lens is suitable. Single landscape lenses are, as a rule, too slow for such work, owing to the diminution of illuminating power caused by the necessary employment of a small diaphragm. If, however, the subjects are situated in the open air, and in a bright but diffused light, then, with the assistance of a rapid plate, say one which registers 22° on the Warnerke standard sensitometer, a composition may be arranged, including living models, with a fair prospect of success. In choosing a lens for the purpose of producing home pictures, one possessed of good covering power should be selected, which means the capability of giving a distinctly and brilliantly sharp image right up to the corners of the focussing or ground-glass screen. With such a lens, rapid plates, and an active light, the mere mechanical part of the work is well provided for. A lens of the rapid rectilinear type, described in the seventh article of this series (see page 537), will be found to be a very useful instrument when used under the conditions just named.

In all cases where an exposure of three seconds or more becomes requisite in order to secure sufficient detail and force to make a good printing negative, and where the nature of the subject necessitates rapidity of action, although perhaps poorly illuminated, a lens of the rapid rectilinear type may not be sufficiently quick acting for the purpose; but a lens of the rapid portrait combination type will most likely satisfy the requirements. A very useful form of lens is the Voigtländer Rapid Eurycope. Her Prumm, speaking of the merits of this lens, says:—"Compared with a three, four, or five inch portrait lens" (diameter of lens is meant), "the exposure for the new eurycope, with full opening, had to be about a quarter or one-third longer; but the sharpness was much greater. If the same definition was required from the portrait lens, a smaller stop would have to be used, and in that case the eurycope would be quicker. The Ross Universal Symmetrical Lens is somewhat similar. These instruments are constructed to admit of being used with a full aperture, whereby portraits and objects not situated at very distant planes can be taken with sufficient sharpness for all practical purposes, at the same time admitting the passage of a maximum amount of actinic light. The insertion of diaphragms of small dimensions renders this class of instrument suitable for work in the field, where objects at greater distances may be well defined. Thus it will be easily understood that, if separate negatives of figures and suitable surroundings are made, it only remains to print the desired portions of each on one piece of sensitive paper without showing the junction, in order to build up what may turn out to be a very satisfactory picture; perchance equalling in all respects those to which allusion has been made.

To photograph a favourite horse is a frequent request made to an amateur, and the task is by no means a difficult one, provided the light be good, and the instrument quick acting and embracing a fairly wide angle. Most of the rectilinear lenses by reputed makers answer the condition; but, in choosing a position for the animal, it is very necessary to success that the source of light should be behind the camera—not directly so, but a little to one side. On no account must it shine into the lens. Unnecessary difficulty arises when the sun shines upon a broad space of gravel or light-coloured soil between the camera and the object, when the latter is for other reasons placed in the shade. A projecting cone of blackened cardboard adjusted over the lens tube will set this right if the focus be not very short. A plain building is, perhaps, as useful a background as any that can be chosen for the purpose; doorways and windows, with their straight lines and



angular markings, when seen close to the figure of a subject, are apt to mar the effect, so should be avoided if possible.

Anyone who has tried the experiment knows that horses very soon tire of posing; they are apt to get fidgety or appear surly; therefore it is always better to complete what preliminaries may be necessary as quickly as possible, and when all is ready for an exposure, to get an assistant to stand a few yards away from the camera with a sieve of corn, which should be shaken while the horse is called by name. A ruse of this kind will usually attract the attention of the animal, and materially improve the position of the head as a study. To secure this advantage the photographer must, of course, be quick to expose at the proper moment. These remarks do not apply to photographing groups of animals in open landscape, where snap shutter exposures are usually made. Such work will be dealt with under the head of instantaneous photography. As we proceed, suggestions will be made respecting the arrangement and taking of groups of various kinds; also dogs, cats, and other home favourites, all of which subjects may appear simple enough to do, and generally are, when one can command the most suitable conditions. Still, it cannot be too strongly impressed upon the tyro, especially in the columns of this journal, that all that is required to secure good pictures is the production of sharp, clearly defined negatives of subjects, well modelled as regards light and shade, and the subsequent printing from the same with care and taste.

### THE PRODUCTION OF PICTURES BY THE ACTION OF COLD.

BY D. WINSTANLEY.\*

#### ARTICLE II.

MY attention being again called to the production of pictures by the action of cold, I am again tempted to make some experiments in connection with the matter, and it appears to me that the best thing to do for a beginning is to initiate, if possible, a repetition of the natural phenomenon I have already observed (see p. 517).

The frosts of winter are not yet upon us—here in Manchester, at any rate—though it seems likely we shall have them both severe and soon. The condensation of moisture on the windows after sundown is, however, often copious enough. It has occurred to me, therefore, to attempt the production of pictures in moisture for the present, as a prelude to their production in ice or other materials at a later date.

On the 2nd, 3rd, and 4th of October, I accordingly hung sheets of paper inside and outside certain of the windows of my home, varying the experiment with the experience gained. I caused these sheets to hang against, or nearly against the glass, by using gummed paper at the top of each, and I left a "gas" flame burning in each of the rooms where the experiments were afoot. My idea was firstly, that water would be generated by the combustion of the "gas;" secondly, that its vapour would be dissipated throughout the air contained within the rooms (these two things, of course, are fairly certain); thirdly, that condensation would take place upon the window glass where the paper was not, and not where the paper was, or that if it took place there also, that it would be slighter than where it was not, and that the character of the deposit would be influenced by the evenness or unevenness of the paper itself, and by any variations in the colour of its surface. It appeared to me that radiation would be more readily effected from the unscreened glass than from those parts which were protected, and also that a printed paper with the print towards the glass would radiate more readily where the printed matter was, than where it was not, and that, in consequence, I might expect there would be a deposit of dew in the first place where the paper was not, and in the second place where it was, and that the deposit

under the paper would be variegated in character in accordance with the printed matter on it.

My experiments have proved more successful than my theory. No visible moisture whatever condensed on any portion of the window which had the sheets outside, a circumstance I attribute to the fact that there was a fire within the room, and a better circulation of the air, by which probably the greater portion of the aqueous vapour was carried off. This experiment (repeated on each night) was accordingly a failure. In the room where the fire was not, and where the papers were inside, the experiment was successful, but the nature of the success was not exactly what I looked for. The condensation of the moisture was not around the papers, but beneath them, i.e., on these portions of the glass they covered. The glass around remained quite clear. The great satisfaction of the experiment, however, was in the fact that the bolder portions of the printed matter were reproduced in dew drops differing in character from those of which the ground was made, and a woodcut with which this printed matter was illustrated was exquisitely represented. The picture to me was charming, and as I examined it in the now darkened room by the feeble glimmer of the street lamps outside it gradually exhaled, *sic transit gloria Mundi*. On the second evening of the experiments I used a sheet of common foolscap writing paper on which I had depicted (with Brunswick black) a large cross with lines of an inch and a half in width, and dividing the paper into four. It was hung (cross side inwards) in a room without a fire, but in which a gas light burned, and on the inside of the glass.

This experiment was likewise a success. The moisture condensed beneath the paper only (not around), and only beneath the paper where the cross was not, so that viewed in the darkened room against the background of a clouded sky, and seen only by the glimmering of the lamps outside, the picture represented a cross in black (clear glass) upon a ground of grey, having the appearance of the focussing screen of a camera.

On the third night the experiment was repeated with two sheets of paper marked with the figure of the cross; one sheet in the same room as before with the gas light only burning, and the other one in a room with neither gas nor fire. The latter experiment was the more successful of the two, and introduced me to another and very beautiful phase of the phenomenon. The glass of the windows was carefully cleaned and wiped, and the screens (previously dried before a fire) were hung at sundown.

The experiment in the room with gas-light turned out as it had done before, and needs no further mention. The other, after remaining something above an hour, presented the clear glass cross upon the seemingly ground-glass ground, but the evenness of the dew deposit was so great as to make the picture almost perfect of its kind. Looking at it again (the screen had been dropped down) about four hours later in the night I found the whole phenomenon had changed. The cross appeared as a ground-glass figure most admirable in its texture, and upon a ground of seeming black sporadically illuminated by spangling stars. The moisture beneath the paper where the cross was not had accumulated into drops too small to run, and too large to diffuse the light as it had been diffused before, whilst beneath the figure of the cross the dew had been deposited in particles individually invisible, but of the character which sufficed to scatter the feeble lamp-light in a most admirable way.

The true theory of the phenomenon I apprehend is this: that the heat radiated to the window by the room prevented the formation of dew upon the window glass where it was bare; that the white paper reflected back this heat, and permitted the glass beneath it to grow "cold," whilst beneath the cross of black the heat had penetrated, and so prevented the deposit for a time—for a time in which the moisture beneath those portions of the paper which were white had been able to accumu-

\* Continued from page 515.



late to an extent too great to effect the scattering of the lamp light gleams.

I think there can be no doubt that when the frosts "set in" I shall easily obtain these frigerograms in the form of ice. Meanwhile I shall continue my experiments with a view of obtaining pictures in chemical substances which will make them "permanent" in kind.

In conclusion, I think I may say we have got thus far—that frigerography is a fact. We no longer need merely to "believe" the Chinese tradition which "credits the sun with sometimes producing pictures of the neighbouring objects upon the ice-covered surfaces of lakes and rivers," though I "most powerfully and potently do believe" it, and the readers of this journal no longer need to merely trust to my veracity concerning what I saw of the Wisconsin frosts, for every one may easily verify for himself what I now relate, that pictures are producible by the operation of the "cold."

## COLOUR SENSITIVE COLLODION EMULSION EQUAL IN RAPIDITY TO GELATINE PLATES.

BY DR. H. W. VOGEL.

AN article in the PHOTOGRAPHIC NEWS of October 19 directs attention to my researches upon Dr. Albert's emulsion. I have continued my experiments, with the assistance of my son, Ernst Vogel, and we have now succeeded in preparing an emulsion similar in every respect to that of Dr. Albert, and equal in sensitiveness to ordinary gelatine plates.

From what has been previously stated, it will be understood that Albert's collodion emulsion contains the same modification of silver bromide as the ordinary well-known collodion emulsion—that is to say, a white bromide of silver, sensitive to the violet and indigo rays of the spectrum.

In our first experiments we thought that Albert's emulsion (before being dyed) was somewhat more sensitive than the ordinary collodion emulsion. In order to settle this point positively, we prepared a fresh collodion emulsion, made according to Warnerke's formula, and compared it with that of Albert. We found that Albert's (undyed) emulsion was in no wise more sensitive than that made according to the before-mentioned formula.

Further experiments were then made by dyeing the emulsion which we had prepared, with Albert's portrait-dye. It then showed precisely the same sensitiveness as Albert's dyed emulsion.

From these experiments it follows that there is no difference between Albert's emulsion in the undyed state, and the collodion emulsion as hitherto well-known. The novelty lies only in the colour sensitiser. With regard to the latter it has been already stated that it contains erythrosin, but that silver could not be recognised therein by the accustomed test of hydrochloric acid. Close examination of the matter shows that eosin silver dissolved in dilute nitric acid only gives a precipitate with hydrochloric acid when there is a little nitrate of silver in excess: otherwise not.

Further trials with Albert's portrait-dye solution gave results unmistakably like those obtained with a solution of eosin silver in ammonia. Both solutions showed, when carefully neutralised with nitric acid, a cloudiness, and precipitation of red erythrosin silver. Albert's colour solution, however, proved to be in a more concentrated state than a saturated solution (about 1 in 1,000) of erythrosin in alcohol.

From various trials it was found that erythrosin is much more soluble in methyl alcohol than in ethyl alcohol, and that a solution of 1 part of erythrosin in 200 parts of methyl alcohol was more intense in colour than Albert's solution. This solution (of erythrosin in methyl alcohol) was then added in the proportion of one to ten to

the collodion emulsion, and tried. The colour sensitiveness proved, however, to be but slight, and did not approach that of Albert's preparation.\*

The dye solution was now mixed with an alcoholic solution of silver, and the precipitate re-dissolved in alcoholic ammonia. The solution thus obtained was added to ten times its amount of bromo-silver collodion emulsion. We thus obtained an emulsion which corresponded completely with Albert's portrait dye collodion both in colour sensitiveness, and in general sensitiveness. Addition of picric acid made not the slightest difference to it.

In order to make quite certain that we had reached the same result as Dr. Albert, we sensitised a portion of our emulsion with Dr. Albert's colour solution, and another portion with the solution we have described, and exposed plates prepared with these preparations simultaneously, and for a like length of exposure to a colour chart. The result was that in colour as well as in general sensitiveness the two plates were identical.

From what has been said, there remains no doubt that Albert's colour sensitive collodion emulsion (for portraits) consists for the one part of a collodion emulsion prepared in the customary way, and for the other part of a very concentrated solution of erythrosin silver in methyl alcohol and ammonia, with some picric acid. The value of the picric acid remains undecided. To Dr. Albert, however, is due the credit of having first discovered the surprising sensitizing power of a very concentrated solution of eosin silver in ammonia. Without his example others would not so quickly have come upon the interesting fact that it is possible to prepare colour sensitive collodion emulsion attaining the sensitiveness of gelatine emulsion. Dr. Albert has thereby opened a new road.

We give here the formula for an erythrosin silver dye solution:—

A.—Erythrosin ... .. 5 gramme  
Pure methyl alcohol ... .. 100 c.c.m.

B.—Nitrate of silver ... .. 4 grammes  
Warm water ... .. 4 c.c.m.

After solution, add 96 c.c.m. pure alcohol at 96°.

10 c.c.m. of A is mixed with 1 c.c.m. of B, and 4 c.c.m. of alcohol (not aqueous) ammonia. This mixture will keep.

For use, 1 part of the solution is shaken up with 10 of bromide-silver collodion emulsion.

We have also experimented with Dr. Albert's "reproduction dye," which contains rose Bengal silver, but did not obtain the desired result.

As a developer, we employed hydrochinone with carbonate of soda and a few drops of solution of bromide of ammonia, according to the following formula:—

1.—Hydrochinone ... .. 10 grammes  
Sulphite of soda ... .. 50 "  
Water ... .. 700 c.c.m.

2.—Crystallized carbonate of soda 100 grammes  
Water ... .. 800 c.c.m.

60 c.c.m. No. 1 are mixed with 10 c.c.m. of No. 2, and two or three drops of a 10 per cent. solution of bromide of ammonia added thereto.

The only drawback to the process is that the plates are only useful in the wet condition. When dry they are twenty times less sensitive; and as dry plates, generally useless.

We shall have more to say in our next upon certain characteristics of the emulsion.

\* Erythrosin in water and erythrosin silver dissolved in ammonia show the same spectrum, because erythrosin silver is decomposed by ammonia. On drying, as the ammonia evaporates, erythrosin silver is again formed.



## THE STUDIO OF THE FUTURE.

BY C. BRANGWIN BARNES.

I ENTERED the reception room of Messrs. Magnesium Flash and Co., and intimated to the presiding genius of that apartment that I wished to be photographed, if the day was not too dull. "Not at all," was the reply, and my attention was invited to various styles and sizes of portraiture from which to select how I would be taken. I chose the three-quarter cabinet, and was requested to walk into the next room and take a seat.

"Shall I have long to wait?" I queried.

"Oh no," was the response; "you will be taken at once."

I accordingly entered what seemed to be a thoroughly well-appointed drawing room, but which was lighted by gas instead of daylight. True, there were two windows, one on either side, of ground glass, and behind each of which gas seemed to be burning, so that they could not communicate with the open air. I walked across the room and took a seat, casually taking up a paper from a table. Scarcely had I done so when the illumination of the apartment seemed to suddenly increase, and as suddenly decrease again. I looked towards one of the ground-glass windows from which the increased illumination seemed to have proceeded, and the same thing occurred again, only from the other side. Rather puzzled as to what was going on I rose from my seat, and scarcely had I done so when once more the brilliant illumination occurred, and a gentleman entered the room, to whom I intimated my desire to have a photograph taken.

"It has been done," he replied, "and if you will take a seat for a few minutes I will bring you the proofs."

"Done! proofs!" I exclaimed; and seeing my perplexity, the operator—for such he seemed to be—explained, "All our portraits are taken by flash light, worked from the other sides of the windows you see on each side; our sitters not being aware that they are being taken, we obtain perfectly natural poses and expression."

"But," I queried, "where is the camera?"

"I will show you," he replied, and following him, I was conducted into what was, in reality, the operating room, through the walls of which the lens was fitted, and from whence, by squeezing an india-rubber ball, the magnesium powder was blown through the gas flames behind the ground-glass windows.

On my explaining that I also belonged to the profession, I was admitted to the dark room, and shown the three negatives which had been taken of myself, which were just developed and about to be printed. This operation was carried out by fixing a piece of bromide paper to the wet film, exposing to light, and developing. The proofs being very satisfactory, I wished the operator "good day," gave my order to the young lady in the reception room, paid the cash, and awoke to find myself by my own fireside, where I had gone to sleep while perusing an advertisement of a new flash-light apparatus.

## Reviews.

INSTRUCTION IN PHOTOGRAPHY. Eighth edition. By Captain W. DE W. ABNEY. Crown octavo, 400 pages, paper cover. Price three shillings and sixpence. (London, 1888: Piper and Carter, 5, Fumival Street, E.C.)

So well known and so universally approved is Captain Abney's "Instruction," that we need scarcely speak of it in high terms. The book before us is substantially that with which our readers are so well acquainted, although well brought up to date by the addition of matter on Orthochromatic Photography and other subjects recently come into importance.

The introduction of the metrical system side by side with the system in more common use in this country is a feature of the eighth edition of Abney's "Instruction"; but, as the author points out in a prefatory note, some errors of arithmetic have crept in, but in every case the reader can "readily ascertain if any serious mistake has been made by the following simple rules, which give very close approximations to accuracy. To convert grains per fluid ounce into grams per litre, multiply the number of grains by 2.3. To convert grains per fluid ounce into grams per 100 c.c., multiply the number of grains by .23. To ascertain the number of c.c. which should be added to a litre as equivalent to the number of minims added to a fluid ounce, multiply the minims by 2.1."

THE BOOK OF THE LANTERN. A Practical Guide to the Working of the Optical (or Magic) Lantern. With full directions for making and colouring lantern pictures. By T. C. HEPWORTH. Cloth boards, crown octavo. 278 pages, and seventy illustrations. Price 3s. 6d. (London, 1888: Wyman and Sons.)

HERE we have something like a lantern manual! A handsomely bound, comprehensive work, written by an acknowledged master in lantern operations. Not very much space is devoted to the history and construction of the lantern, the author's aim being evidently a practical one. He, however, devotes a chapter to the very important subject of the true optical relations of condenser to objective, and to kindred points, as he knows very well the importance of this matter in managing a lantern.

Oxygen gas making, limelight jets, regulators, gas bags, and screens are discussed with the clearness of a literary adept, and the confidence of one who is acquainted with his subject, and knows his strength.

Next come a few chapters on lantern-slide making by the aid of photography, and also short essays on making photo-micrographs for the lantern, and enlarging by the aid of the lantern. Other chapters deal very fully with the details of exhibition work and accessories of the lantern.

## INSTANTANEOUS STUDIES.

PHOTOGRAPHY IN THE LAW COURTS.

(Suggested by the wonderful display of photographic knowledge displayed as a rule by gentlemen of the long robe.)

*Counsel for defendant (in an action, say, over defective plates):* Now, sir, how did you treat those plates?

*Plaintiff:* Do you mean develop?

*Counsel (severely):* Never mind, sir, what I mean. I want to get at what you mean. When you took those plates into your dark room, what did you do?

*Plaintiff:* I developed them—that is, I tried to develop them.

*Counsel:* Oh, you tried; and how did you try.

*Plaintiff:* I used pyro and bromide of ammonium with some, and ferrous oxalate with others. In each case the result was a failure.

*Counsel:* Is ferro-oxygen a developer in common use?

*Plaintiff:* I beg your pardon, I never heard of the name.

*Counsel (impatiently):* You used it yourself (*hesitates about repeating the term*).

*Plaintiff:* You mean ferrous oxalate. Yes, certainly.

*Counsel:* And what about the polo and bromine of aluminium?

*Plaintiff (hesitating):* The polo and—

*Counsel:* Yes, yes. You know what I mean—the first mixture you mentioned. Is it the proper thing to use?

*Plaintiff:* Oh, yes.

*Counsel:* Do you read the photographic journals?

*Plaintiff:* Sometimes.

*Counsel:* Do you know that hydraquinine is recommended?



*Plaintiff.* You mean hydrokinone, I suppose. There are a good many developers in use. There's no rule.

*Counsel (baffled).* Oh, there's no rule, and that you swear. Well now, we'll take the—*(stoops down and whispers his junior)*—yes, the ferri-oxygenate.

*The Judge (gently).* The ferro-silicate, I think, was the term used by the plaintiff.

*Counsel (crossly).* Well, when you used the something-ate what did you notice?

*Witness.* I noticed the presence of green fog.

*Counsel (thinking he has got something at last):* Oh, a green fog. Now, let me ask you, is your dark-room ventilated?

*Plaintiff:* Few dark-rooms are *(laughter)*.

*Counsel (triumphantly):* I thought not. The day was a cold one, I believe.

*Plaintiff:* Yes, fairly cold.

*Counsel:* Now, sir, I ask you on your oath, whether it is not possible that the air of the dark-room, being moist and warm, and the air outside being cold, produced the foggy atmosphere you speak of.

*Plaintiff (bewildered, and trying to understand what the learned Counsel is driving at):* I'm not sure. I don't think so. I don't know. I did not say anything about a foggy atmosphere.

*Counsel:* Oh, yes you did. I took down your words, and so did his lordship.

*The Judge:* I have on my notes "a green fog."

*Counsel (exultantly):* Quite so. Be careful, sir.

*Plaintiff:* I am trying to be. The green fog I spoke of—

*Counsel:* Pray don't argue, sir.

*The Judge:* Yes, you'd better confine yourself to simply answering the questions of the learned counsel.

*Counsel:* You hear what his Lordship says. Now, is it not a fact that certain acids give off vapour?

*Plaintiff:* Oh, certainly; but I don't see what that has to do—

*Counsel (severely):* Answer me, sir. Does not chlorine *(whispers to junior)*, yes, chlorine acid give off a greenish gas?

*Plaintiff:* The vapour of chlorine is green, I believe, but—

*Counsel:* Attend to me, sir. Will you swear you did not have a bottle of chlorine acid gas in your dark room improperly corked; and if so, would it not produce the green fog you speak of, and so injure the plates?

*Plaintiff:* I've not had any chlorine in my dark room at all. The fog I speak of was not in the atmosphere, but on the plate.

*The Judge:* A fog on the plate! Let me clearly understand, for it seems to me we are all in a fog. *(Everybody roars, as in duty bound, at the judicial jokelet.)*

*Plaintiff:* If your Lordship will permit me, I will try and explain. *(Does try, but only succeeds in involving the matter in further confusion, as it is well known that learned counsel and sometimes the judge refuse to be instructed by witnesses. Eventually, to the relief of everyone save the plaintiff and defendant, who see their costs mounting up, the judge refuses to go further into the matter, but refers it to a scientific expert.)*

## ELECTRIC LIGHT IN THE STUDIO.

BY FRANK HAES.\*

I TRUST you will not think me presumptuous if I choose for my subject "Electric Light in the Studio." I also hope I shall be forgiven if I appear to be egotistical in my remarks, but the greater part of my paper can only be the result of my own experience. I do not propose to speak of any system of flash light, however perfect, because at the best, at present, they are startling to the sitter, and, I think, not to be compared with the comfort of coming into a studio of which a portion is brilliantly illuminated.

I have chosen this subject because I believe that in the near

future, owing to the rapid improvements in the designing and manufacturing of electric plant, and to the greater facilities for erecting central installations given by the amended Act of this year, and also largely to our uncertain climate, the use of the electric light must become much more general in our towns; and if I succeed in cautioning any one to avoid the many pitfalls in his way I shall be fully repaid. I will suppose it possible to have the current supplied from a central installation, and here recommend that a light of about 6,000 actual candle power be arranged for.

When inquiring for this some years ago, I was told by a well-known Company that they would supply me with one, and I naturally asked to be allowed to go to their works to see it burning. This was refused, and on further pressing them, it turned out that their so-called actual candle power was only a nominal one. However, when I proposed that payment should be made in nominal sovereigns, they did not seem inclined to assent, so I dropped negotiations in that quarter. The light should be seen and tested by the spectroscope, as some systems give much more of the violet and ultra violet rays than others; of course, these are better for our purpose.

Another point to be noticed is the character of the arc. Some systems work the carbons very close together, and in that case the crater throws the light either all up or down, according to the place of the positive carbon. I do not advise such a light, but one which has a moderately long arc, when the light is thrown more horizontally. It is also preferable to use a current of low intensity with a large flow, as there is nothing like the danger from the shock if accidentally the operator should make his body form part of the circuit. I may say this may be only caused by very great carelessness. Make a rule never to hold both leading wires at once, even when covered.

An assistant who was with me for some years was with Mr. Van der Weyde when he made his first experiments in Euston Road, at, I believe, the British Electric Light Company's works, and afterwards when he opened his studio in Regent Street; and discussing the methods used by this gentleman, to whom must be given all the credit of successfully introducing electric light in the studio, I did not like the arrangements for keeping the carbons in contact by hand only, as this cannot be depended upon to keep them the proper distance apart, and the light must, therefore, vary constantly in intensity. Nor did I like the plan of the reflector being fixed to a bar rotating on its centre, and I resolved to find some other method for both of these.

I may, perhaps, make my meaning clear by a rough sketch on the blackboard. You will see I am no draughtsman, and therefore, please tell me if I do not make my meaning clear to you. I should mention that I never saw an electric light used for photography until my own was complete. Mr. Van der Weyde's system, no doubt, is known to many now present, and it appears to have been followed by almost every one. I know at least three without any improvement.

I made a substantial stand with a long screw carrying an outer frame, which had four feet range, and when at its highest, the light was about eight feet above the floor; the stand was fitted with three flat legs and solid large castors. I may say that I finally concluded with Messrs. Siemens for the electric plant, and received every courtesy from them, being allowed to go through their works at Charlton, and to see the lights I wanted. Walking through the shops, I saw a search light as used in the navy, fitted with a parabolic reflector which I did not, and a lamp which I did want. This was a focus-keeping automatic feeding lamp, casting scarcely any shadow when in use, which I saw was exactly what I had been in search of. It is mounted on a ball-and-socket joint of large size and peculiar construction, to insure uninterrupted contact when rapidly rotated round a complete circle, and also had a considerable vertical motion. Nothing that I know of has been suggested for a reflector better than the hemisphere of Mr. Van der Weyde, and I had one made of zinc; when it arrived, it was far too heavy to use on my stand, so I asked the makers to take it away, and allow me what they could for it. The price was all but £10; they allowed me 16s., and I had to devise another and lighter one. I went to Thomas, the wire worker, of Edgware Road, who made me a half globe four feet in diameter, of stout wire, soldered at the interlacings; this was covered at the back with black calico, and lined with white enamel paper cut in sections, well lapped, and fastened on with long paper clips; a counterpoise weight was placed at the end of the stand carrying the lamp, and an ordinary opal glass collett placed in front to screen the direct light from the sitter.

\* A Communication to the Photographic Club. ]



But this did not satisfy me, and I always used a disc of wood sliding on a vertical rod. The disc was eighteen inches in diameter, and should be white on the side towards the light, and dead black on the side towards the sitter. This gave the desired result, and the sitter was then bathed, so to speak, in a soft yet brilliant light. The leads from the dynamos were very long, and brought down from the ceiling, and thus I was able to easily move this great light all over the studio.

I found that thus illuminated the sitter was not in any unnatural glare of light, and that any desired effect could be easily obtained, and I have actually had sitters get up, saying it was not possible to photograph them, as there was no light upon them. As all the studio behind the lamp was in apparent darkness, the movements of the operator at the camera were invisible, and the eyes of the sitter always well open and bright, the pupils being expanded more than in daylight work; and many have told me they much prefer sitting with such lighting to daylight, experiencing no unpleasant effect from top light, which is almost always the case in daylight studios, the illumination being so different to what we are usually accustomed.

In one electric light studio I know of, the owner being determined to have enough light, one much more powerful than I have mentioned was first used, without the large disc, with the result that resistance coils had to be employed, and a large quantity of the current wasted; in another large one, the— to my idea—objectionable rotating bar was employed, and nearly in the centre of the room was hung a large counterpoise weight in such a position that the operator was almost certain to knock his head against it in the semi-darkness; and asking the chief operator if that ever happened—well, he thought aloud very strong language about it. In yet another, the principal showing me the leads for the intended light, I told him I thought they were of too small a cross section; he replied that he only wanted 1,200 candle power, which is nothing like sufficient if only the reflected light from the inside of the hemisphere is used, and a reasonably short exposure given. I have photographed dogs by the electric light easily; also groups of several persons, but I must admit that babies and very young children do not seem to like it. I have here a few specimens, almost all printed some years ago, of both untouched and retouched negatives. I venture to claim for a properly arranged electric light, that it gives a picture much more like ordinary room illumination, or, in other words, that by its use we are enabled to produce a portrait without any of those unnatural heavy shadows under the eyebrows, nose, and lips, almost inseparable from daylight portraiture, and to which, unfortunately, we have become so accustomed that we consider them a necessary part of the picture, and are inclined to condemn a picture in which they are absent. There is no part of the face in an electric light photograph which has not some tone on it, the only whites being the high lights in the eyes, and the line along the edge of the nose, which is never made so thick as in daylight work. Any amount of shade—not black shadow—can be easily obtained; if my specimens do not convey my meaning, that is my fault, not that of the method.

I was obliged to have my own engine to produce the light, and had a six horse-power Otto gas engine with two fly wheels instead of the usual single one, to give greater steadiness to the running of the dynamo, all placed on the second floor of an ordinary house; all the plant occupying only 13 feet by 6, and no vibration could be detected on the walls when the engine was running 120 to 130 revolutions a minute, the dynamo making 650 to 680 revolutions. We always knew what exposure to give, the light being always of the same quality. I do not know anything more that I can mention. I have not been able to annihilate myself in this paper, but have had to speak too much of my own doings, and thank you kindly for your courtesy in listening to me. I shall be pleased to answer any questions, if I can, any one present may wish to ask.

### Notes.

Our Supplement of this week, in illustration of a method of working practised by the Swiss Autotype Company, Winterthur, will strike our readers as a fine example of photo-block work, and the method by which it is made is of peculiar interest.

It involves using gelatine plates which have been so prepared as to break up any negatives upon them into a sort of grain or stipple, suited either for the asphalt process or for the gelatine method of making a transfer; and the special point about the Swiss Autotype Company is that they can supply the plates so treated that every photographer can himself make grain negatives with the same ease that ordinary negatives are made. As regards plates and process, the agent is J. R. Gotz, of 19, Buckingham Street, Strand.

The forthcoming Exhibition of Photographs at Moscow, in celebration of the invention of photography, is to be rather a grand affair, the Grand Duke Alexis taking a prominent interest, and lending his influence. The exhibition is to open on the 26th of December, and to continue open until the 15th of March. It is stated that there will be no less than a hundred and sixty medals and other awards.

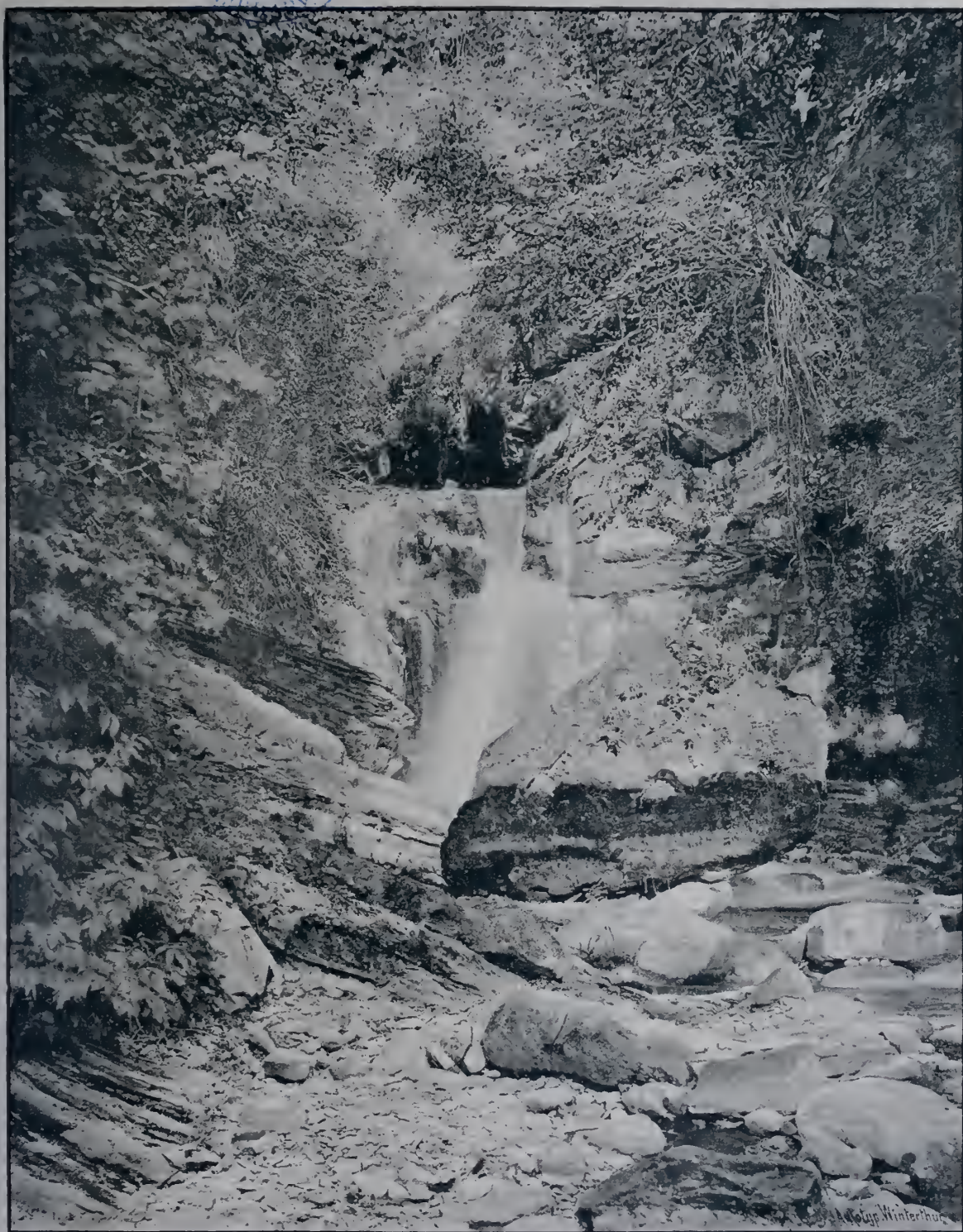
The professional begging-letter writer is as crafty, and has as many expedients, as Master Reynard himself, though, unlike the fox, he employs his expedients not to himself escape, but to prevent others escaping from him. Begging-letter writing has, indeed, been raised well-nigh to the dignity of a fine art by certain of its more skilful professors. And those of our readers who have had any experience of such correspondents know how ingenious they are in the frequent varying of their written appeals. It has remained, however, for one of the fraternity—or, rather, of the “sorority”—for it is a female begging letter-writer to whom we refer—to introduce quite a novel feature into the *modus operandi* by turning photography to account; and not in the obvious way one would have expected. The “lady” beggar in question does not, that is to say, enclose a carte of the emaciated infant to which she pitifully refers in her letter, nor a realistic likeness of the husband who is, according to the same authority, “in the last stage of a galloping (*sic*) consumption.” Oh, dear no! she is far too clever to make any such a bald use of her ingenious notion. She bethinks her of a much more likely way of appealing to the feelings of the ladies she addresses; for after devoting two sides of a sheet of note paper to describing in detail the happy home in which she saw those “better days,” as to whose change for the worse she is so eloquent, she actually encloses what she calls “the only relic left me of a once wealthy and worthy parent, and of the halcyon hours of my youth” (halcyon is a good word, and spelled correctly, too) in the shape of a faded photograph of a glass shade under which is a silver flute gracefully laid in sections in a leather case, on the cover of which is an engraved plate setting out in legible letters that the said instrument was presented to Doctor So-and-so for his devotion to the poor of B— during the prevalence of the cholera epidemic of 1842.”

Now it seems to us that the indigent “lady” who encloses a copy of this photograph in her begging letters is a worthy disciple of Defoe himself. There is something, indeed, irresistibly realistic about a silver flute, especially





2<sup>d</sup> November 1888.



Taken from Nature



PATENT OFFICE LIBRARY



a silver flute under a glass shade, and it requires a considerable effort to doubt the *bona fides* of a correspondent who encloses such an unimpeachable silent witness to her integrity as this. That begging-letter writer, whoever she be, is, in her line, a thorough artist, and if she could only register her photographic inspiration, and make her fellow begging-letter writers pay her a royalty for using it, she ought to make a large income.

From E. V. Boissonnas, of Geneva, we receive some remarkable illustrations of the advantages to be gained by using orthochromatic plates and the yellow screen when atmospheric effects are to be reproduced. In one example we have Mont Blanc taken from Geneva on an ordinary plate, and on an orthochromatised plate (the exposures being, of course, made at the same time), while in other instances we have mountains which are quite invisible on the ordinary plate, but finely rendered on the orthochromatic plate.

The latest aerial photographic apparatus is a military invention which combines a rocket and a camera. The latter is attached to the former, which is sent up in the sky—in the daytime, of course—and the opening and shutting of the dark shutter are regulated to take place at a moment when the rocket has nearly attained its full height. A parachute apparatus attached brings the camera to the ground slowly, safely, and, no doubt, gracefully. The idea seems very pretty, but savours slightly of Munchausen—probably due to the fact that the invention was first made public in a Society paper.

The prisoner in an assault case tried last week at the Old Bailey has reason to congratulate himself that he was an amateur photographer. He was charged with throwing some corrosive fluid upon a young lady with intent to injure her. The corrosive fluid in question was sulphuric acid, and the defence was that the prisoner amused himself as an amateur photographer, and finding the bottle in his pocket he threw it away, and the fact of some of the acid going on the dress of the prosecutrix was an accident. The jury accepted this view, and returned a verdict of not guilty. We congratulate the accused upon his escape, and trust his experience will prove a warning to him not to carry his chemicals about with him and throw them away at random in the public streets. The first rule of the amateur should be order and regularity, exemplified in the old adage, "a place for everything, and everything in its place." The place for a bottle of sulphuric acid is certainly not in one's coat pocket.

Is a photographer a good man of business? This is a question which occasionally exercises people's minds, especially when they are impatient for their orders to be executed. Rightly or wrongly, photographers have a reputation for being unbusiness-like, and this feeling found expression at the meeting of a mining company held last week in the City. A candidate for directorship was objected to by a shareholder, in these terms, according to the

*Financial World*:—"Mr. Du Val, he (the shareholder) was given to understand, was a photographer. No doubt he was a first-class photographer, but he (the speaker) would not select a photographer to take the helm of a ship in a storm." It is not very clear why a photographer should not do as well as anybody else under such circumstances. Indeed, we fancy he would do better, for whatever faults he may have, a photographer is generally possessed of readiness of resource. The meeting appeared to think so too, for the despised photographer was among those elected.

They have a peculiar class of thieves at the Patent Library. There is nothing extraordinary in coats and umbrellas disappearing, but we do not quite understand the contemptible meanness of the people who abstract photographic reproductions when such specimens accompany the photographic journals. The authorities are, however, quite alive to the necessity for precaution. In the first case readers are now requested to place their coats and umbrellas in the care of an attendant, and in the second all photographic periodicals containing reproductions are kept in an inner room.

## Patent Intelligence.

### Applications for Letters Patent.

- 14,652. WILLIAM HUGH RUBENS KERRY, 6, Lord Street, Liverpool, for "Improvements in Photographic Cameras."—October 12th, 1888.  
 14,696. WILLIAM WATSON, 22A, Church Street, Islington, London, for "Improvement in the Hinge of Shutters used in Dark Slides for Photographic Purpose."—October 12th, 1888.  
 14,801. GEORGE CHARLES INKPEN, 12, Havelock Road, Southsea, for "Holding or Supporting a Photographic Camera or similar Instrument in combination with an ordinary Walking Stick and Folding Tripod."—October 15th, 1888.  
 14,851. CHARLES LE ROY and LEON GUYURA, 47, Lincoln's Inn Field's, W.C., for "Improvements in Photographic Apparatus."—October 16th, 1888.  
 14,948. EDWIN CHAMBERS JOHN DEVIS, 115, St. Vincent Street, Glasgow, for "Improvements in Photo-printing, and in the Apparatus employed therefor."—October 17th, 1888.  
 15,024. JAMES WOOD, 118, Northbrook Street, Liverpool, for "Improvements in Apparatus for Washing and Drying Photographic Negatives, part of such Improvements being applicable also for Washing Photographic Prints."—October 19th, 1888.  
 15,068. THOMAS PERCY GRAHAM, St. Mary's Buildings, Bedford, for "Photographic Appliances."—October 19th, 1888.  
 15,376. ARTHUR HAMMOND GOODALL, Rydal Cottage, Elms Road, Dulwich, for "An Improved Appliance for Vignetting Photographs."—October 25th, 1888.

### Patent on which the Fourth Year's Renewal Fee has been Paid.

- 15,542 of 1884. A. J. BOULT. (*Eastman and Another.*)—Photographic films.

### Specifications Published during the Week.

- 12,940. FREDERICK WOODWARD BRANSON, Pharmaceutical Chemist, 14, Commercial Street, Leeds, for "Improvements in Photographic Shutters."—Dated September 24th, 1887.

The Patentee says:—

My invention has reference to improvements in photographic shutters for which Letters Patent were granted to me April 17, 1886.

According to my present invention, the object of which is to obtain portability, I make the upper portion of the framework of shutter only equal to about half the length of that portion of the framework which is below the spindle.



The spindle is so arranged that the drop may pass freely under it at any position of the flap of the shutter.

The cross piece or the drop is placed at some distance above the base of the drop. This arrangement ensures the presence of a portion of the drop in the framework of shutter beneath and below the spindle.

I do not regard the weighted arm or pneumatic movements figured in Patent No. 5336, 1886, as essential conditions; one or both may be omitted.

16,018. JOHN EDWARD THORNTON, of 3, New Lorne Street, Moss Side, Manchester, in the County of Lancaster, Manufacturer, for "Flexible Films for Photographic and other Purposes, and Apparatus in connection with the Manufacture thereof."—Dated November 22nd, 1887.

The Patentee says:—

The object of this invention is to provide a substitute for glass for photographic and other purposes, technically known as a "film," which shall be more transparent and translucent than those heretofore in ordinary use, and more easy of manipulation. Films such as are hereinafter more definitely described may be used in obtaining various kinds of photographic impressions, such as negatives, positives, transparencies, and the like. They have also similar advantages to other films, such as lightness and portability, whilst there is a total absence of the troublesome grain so commonly seen in films having a paper basis. They also print much quicker by reason of their greater transparency.

In making other kinds of photographic films it is usual to prepare them upon a paper basis, which either remains permanently a part thereof, or is afterwards stripped off at some convenient part of the process.

In preparing films in accordance with this invention, I use transparent or translucent materials obtained from seaweed, and known as "algulose," "algin," "alginate of soda," and the like, or any other suitable product or products of seaweed in one or any of the following ways:—For the sake of brevity I hereinafter term the said materials "algin." It should be understood that the substance termed "algin or alginate of soda," potash, or other alkali, can be dissolved in water either cold or hot, and possesses the peculiar property of becoming insoluble in water after treatment with mineral acids, lime salts, certain metals such as iron, silver, or copper, and many other like substances; said algin can be bleached when desired, and is better for film purposes if thus treated before being used. Various substances may be combined with the algin if desired, to give it certain properties, such as glycerine for flexibility, silicates for hardness, chrome alum for toughness. I procure a suitable material upon which to prepare the film, but of such a nature that the film may be stripped therefrom by the application of a little force. Anything having a smooth surface, such as glass, ebonite, or other like material may be used.

To prepare a skin or sheet of herein-before described substance termed "algin," it is only necessary to dissolve sufficient of said algin in water to make a thick glutinous solution, which is then flowed out on a level surface and allowed to dry spontaneously or by heat. The resulting film or coating may be afterwards rendered insoluble in the manner as herein previously described, or may be treated for this purpose before drying, and as soon as flowed out if necessary, but in this case considerable contraction and shrinkage of the algin film is frequently the result.

By preference I use a strong solution of calcium chloride to render the algin insoluble, but other solutions may be used to obtain various results.

I produce a photographic sensitive film by either of the following means:—

1. Having obtained and dried a thin sheet of algin in the manner described, the same may be coated on one or both sides with sensitive gelatine emulsion in any convenient manner.

2. The said algin sheet may be coated only on one side with emulsion, or emulsion on front and plain gelatine on the back.

3. The said algin sheet may be coated on both sides with gelatine, and afterwards with sensitive emulsion on one or both sides.

4. The complete photographic film, composed of alternate layers of algin gelatine, and sensitive gelatine emulsion, may be prepared and supported upon a temporary paper basis, and delivered to the consumer in that condition. This is termed a stripping film, inasmuch as the paper backing is detached from the film proper at any convenient time, preferably after the

photographic impression has been obtained thereon; in this case the built-up film may be temporarily cemented to the paper backing by a layer of soluble gelatine, gum, or other soluble cement, which can be afterwards removed by treatment with warm water. A layer of soluble algin may be used if preferred, which would dissolve either in cold water or in the developer, allowing the insoluble film to float off its paper backing.

5. By another method the sensitive material may be incorporated with the algin, and a thicker coating or series of coatings applied without any gelatine layers.

In the first three methods the algin sheet forms the support permanently for the sensitive layer, and in the 4th method the paper backing forms the support until such time as it is thought advisable to remove it. In this latter case the whole is termed a "stripping film." In the 5th method the algin support or basis also forms the sensitive film itself. Although it is possible to coat the previously prepared algin skin with gelatine or sensitive emulsion without some kind of a temporary backing, there are certain objections thereto, one of which is the tendency of the algin to absorb a considerable portion of water from the gelatine, and so cause cockling and unequal expansion, together with difficulties in drying. This, in a measure, may be overcome by stretching or straining the film till dry, or preparing it on a rigid surface instead.

In case the film is prepared on a flexible support, recourse may be had to rolling or callendering the film between successive coatings in order to remove creases caused by unequal expansion. I do not confine myself to any particular order or method of applying the various coatings to produce the finished film, but in order to minimise the hereinbefore-mentioned difficulties of unequal drying and shrinkage of the film, I prefer the following or similar order:—

Having obtained a suitable surface as a support, I coat it first with gelatine, and then dry, then coat with algin and dry; then immerse for a few minutes in the calcium or other solution to render the algin insoluble, dry; and afterwards apply the sensitive gelatine emulsion, then again dry.

If desired, another coating of gelatine may be interposed between the algin and the sensitive layer, and more than one layer of algin may be applied to secure the requisite thickness.

In some cases I dispense with the several layers of gelatine and algin, and simply coat the algin base direct with the sensitive emulsion.

For "stripping films" the soluble or cementive coating may be interposed between the paper backing and the algin layer in lieu of the plain gelatine coating. In the case of stripping films, where it is necessary to remove the soluble cementive coating by warm or hot water, it is necessary to treat all the gelatine in the film proper with chrome alum or its equivalent, to render the gelatine layers insoluble in the hot water.

By using a sensitive photographic film, strengthened by means of algin in the manner herein described, there is no necessity for afterwards strengthening the finished negatives or photographic impressions by the addition of gelatine skins, collodion, or the like, the finished negative being sufficiently strong and flexible when completed, and much time saved. Also in this invention the algin expands with the gelatine in the developing solution consequent upon the absorption of water into the film. By carefully adjusting the thickness of the algin and gelatine, so that both shall absorb an equal amount of water, curling of the film when wet will be avoided.

In producing a flexible film in bands or rolls suitable for use in the roller slide or for other purposes, I adopt or use one or more of the hereinafter described methods and appliances:—

In the first case it is necessary to have a temporary support upon which to prepare the film in a sufficiently long length, the said support to be capable of withstanding the action of the solutions used to render the algin insoluble, also water, and increase of temperature; to be flexible, and yet rigid enough to counteract the cockling and shrinkage of the film whilst the same is drying, and to allow the film to be easily separated when required. For this purpose I prefer to employ the material technically known as temporary support, such as is used in the carbon process, and consisting of paper sized and coated with an alkaline solution of lac and afterwards rolled and waxed. Other materials may also be used, and I do not limit myself to any particular material, but the following may be employed:—Suitably varnished or waxed paper, paper or cloth prepared after the manner of oilcloth; or leather cloth which has a smooth surface.

Whatever material is used may be wound upon a stock spool,



from which it is paid off to the coating machine or machines, which apply the successive layers to its surface. The web is kept in a state of tension during the time that it is passing through the coating machine. Suitable flanged guide rollers in connection with friction rollers, either one or both sets being driven, conduct the material to the coating trough, in which is contained the algin in a glutinous semi-liquid condition. In this the band is passed over, under, against, or around a coating roller, which is immersed in the trough or against a ductor roller revolving in contact with the immersion roller, and against guide rods or scrapers to regulate or gauge the thickness of the coating whereby the band becomes coated with an even layer. In another method of coating which may be adopted I place the stock spool in bearings over the immersion roller or ductor roller, and free to revolve in frictional contact therewith. As the band is drawn off it becomes coated with the solution. Weights or springs may be added to keep the spool in close contact, and adjustable gauge rods or scrapers regulate the thickness of the coating. After the algin coating the band may be allowed to pass through a bath or trough containing the liquid for rendering the algin insoluble; or, if preferred, this operation may be left until after the film has been dried. The band is then run between rubber squeezing rollers to get rid of most of the water, and is afterwards conducted by flanged guide rollers and friction rollers, and travelling bands or tapes, to the drying apparatus, which may be formed of the shape of long boxes or tunnels surrounded or filled with hot air, water, steam, or a solution of acetate of soda, through or between which the band passes, or it may be formed of a number of drying cylinders around which the band is conducted; or it may consist simply of an apparatus for suspending or looping the moist band in a drying room to which hot air is introduced by mechanical or other means, such as a fan blower, or the temperature otherwise raised to a suitable heat. In case the algin web has not been rendered insoluble previously, it must be dried without anything touching its surface; but in case it should have been rendered insoluble through treatment in the manner aforesaid, the face of the algin web may come in contact with the drying cylinders, and therefore dry in much less time. The algin web after drying is ready for the coating of gelatine or sensitive gelatine emulsion, which is applied in a similar manner to the algin as herein before described. The algin web may still remain attached to its support whilst coating, unless it is desired to coat both sides thereof, in which case it is stripped from the support and then passed through the coating apparatus and afterwards dried. In the case of the gelatine or gelatine emulsion coating it is necessary that nothing should come in contact with the face thereof, so that the band must be dried by passing over drying cylinders of such a temperature as not to melt the gelatine, said band having its face outwards, or preferably in a drying-room. The algin coating may be dried at once by heated air of any temperature, but the gelatine coating must be allowed to thoroughly set and stiffen first. This operation may be accelerated by allowing the band to travel through a shaft or chamber cooled by ice or cold air supplied by fans, blowers, or other means in the usual manner. Heated air may then be used to hasten the drying of the moist gelatine coatings.

In the case of a coating applied only to one surface of the band at a time, I prefer to let the band travel horizontally and perfectly level till the coating has set; but in cases of coating both sides at once it should travel vertically. To keep the band from curling at the edges before setting, and whilst travelling horizontally, I provide overlapping guides which just keep the edges flat, or weighted rollers having collars or flanges arranged to press on the edges of the band only.

The band, if in one length, may be suspended automatically or by hand in loops either in the following or other suitable manner. In order that my invention may be more clearly understood, reference may be made to the sheet of drawings hereto annexed. The coated part of the web is from W to W, so that the edges of web are gripped by the collar *v*, and are uncoated; the rollers *u* and *v* revolve together either by friction, spur wheels, or other means, and the two may be held close together by springs or bands. I term each pair of rollers, *u* and *v*, a looper.

The loopers slide loosely on a frame, *t*, and may be separated any distance apart from each other, either by an attendant, or automatically by an endless chain or belt having projections thereon at intervals so arranged as to move the loopers forward at intervals.

The top roller of each looper is driven, either by endless band friction wheels, or other equivalent or suitable mechanism, and

communicates motion to the corresponding lower roller, either by frictional contact as hereinbefore described.

The motion of the band may be stopped at will by lifting the top rollers out of gear with the bottom ones, or by throwing the top rollers out of gear with the driving mechanism. The web is passed between the loopers at one end of supporting frame, and the said loopers are afterwards separated, the necessary distance apart as each loop is formed. One looper or pair of rollers forms the suspending point for one loop. I regulate the speed of the various parts so that the delivering of the web from the coating to the drying machine shall be greater than the travel of the looped and suspended web, and thus form the loops automatically at one end of the drying machine.

So long as the loopers continue to revolve the web will have a continuous forward motion, and the constant change of its suspending points will tend to equalise the drying of the coating, and prevent streaking; and also to prevent cockling and especially curling up of the edges of the web and film, I so arrange the length of travel and temperature of the drying-room that the coating shall be dry and hard before the web leaves the machine. In cases where the length is not sufficient I pass the web under the drying machine, and join the two ends of the coated web so as to keep the whole continuously moving as one endless band.

The following should be mentioned. The algin coating remains liquid until thoroughly dried by air, or until rendered insoluble in the manner hereinbefore described. The gelatine coating ceases to be liquid as soon as it is set by reduction of temperature. It will thus be seen that in order to prevent streaking or running of the gelatine it is better that the coated web should travel horizontally until set, after which it may be placed or hung in any position to dry and harden.

On the other hand, the algin coating must be kept in motion, and if suspended its points of suspension must be constantly changing until it has dried, in order to ensure an even coat on the web.

This is secured by suspending the web in the looping frame or drying machine in a room supplied with heated air, which is previously filtered in the usual manner to avoid dust.

The web whilst in the looping frame is kept constantly travelling in a forward direction. In order to facilitate the drying I coat with a very concentrated solution of the algin containing as little water as possible. If, however, the algin is rendered insoluble or "set" as described, before leaving the coating machine, the web may be dried whilst suspended without producing an unevenness of the coating, or it may be dried by the drying cylinders, as the algin does not liquefy by heat same as gelatine.

If the algin coat is dried first it must be rendered insoluble afterwards and again dried.

#### *Description of the Drawings.*

Fig. 1 represents alginizing machine: *a* is the stock spool, *b* the alginizing trough, *c* immersed coating roller, *d* guide rollers, *e* trough with liquid for rendering the algin insoluble, *f* squeezing rollers, *h* the web, *g* gauge rod to regulate thickness of coating; arrow indicates direction of web *h* to drying machine represented either by fig. 6 or fig. 7.

Fig. 2 represents gelatinizing and emulsion coating machine. *j* is the stock spool, *h* the web, *k* guide roller, *l* coating trough containing gelatine or sensitive gelatine emulsion, *m* immersed coating roller, *n* levelling table for setting liquid gelatine.

Figs. 3, 4, and 5 are modifications of fig. 2. *o* is the ductor roller intermediate between the immersion roller *m* and web *h* to be coated. Fig. 6 is drying machine, *h* is the web, *g* guiding rollers, *r* drying cylinders, *s* receiving reel. Fig. 7 is looping and drying frame, and fig. 8 end view of same. *z* is the final receiving roller for web *h*, *x* is endless chain for forwarding loopers along frame *t*.

If the band should be divided into several shorter lengths, each one may be suspended singly in a drying-apparatus, the said drying-apparatus or frame operating to suspend the various lengths one behind the other, with suitable space between them, and to push or move the suspenders one space forward for each separate length automatically: the several lengths may each have a weighted bar attached to bottom end in order to keep the film stretched until dry, and thus prevent cockling; or each band may be separately stretched on a drying or stretching frame in any position, vertical or otherwise, by attaching to suitable stretching mechanism.

The films may be prepared in sheets on rigid surfaces when desired by coating, and drying in the same manner as dry plates, and afterwards stripped.



Films so prepared may be utilized in place of the ground glass focussing screen in cameras. In the case of ordinary transparent films prepared according to this invention, the film remains attached to its temporary support until it is finished, and perfectly dry, after which it is stripped, and is then ready to be packed for use or wound on spools, and forms a strong flexible material. To strip the film from its preparatory or temporary support I separate a portion at one end by hand, and then attach the support to one reel, and the film to another reel, and then cause both to wind in opposite directions until the film and support are entirely separated throughout their length, each being wound on a separate reel.

By coating and drying both sides of the temporary support, either together or separately, and afterwards stripping, two films may be prepared in the same time as one. In the case of "stripping films," the paper backing upon which they are prepared, and sold to the consumer, remains attached until the negative has been obtained, after which the stripping may be done in the usual manner.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is—

1. In the production of a sensitive photographic film the use of algin, algulose, alginates, or similar compounds or products, such as are obtained from seaweed, as the base or support for a sensitive photographic film, substantially as hereinbefore described, said base being rendered insoluble during the manufacture.

2. A complete sensitive photographic film consisting of one or more successive layers of algin, gelatine, and gelatine emulsion, substantially as hereinbefore described.

3. In a sensitive photographic film such as hereinbefore described, the combination of the sensitive compound with the alginous base whereby the base and sensitive surface are combined as a whole, and afterwards rendered insoluble instead of successively applied layers.

4. A complete photographic film composed of an insoluble algin base and sensitive gelatinous coating, the said film being

FIG 1



FIG 2

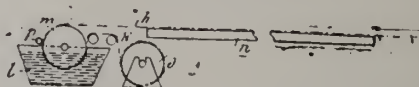


FIG 3



FIG 4



FIG 5



FIG 6

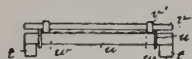


FIG 7

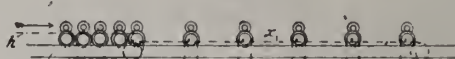
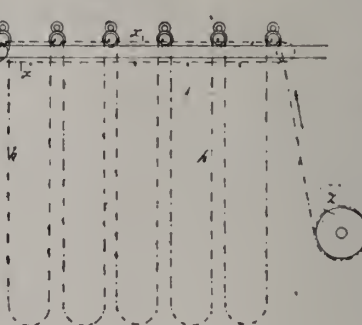
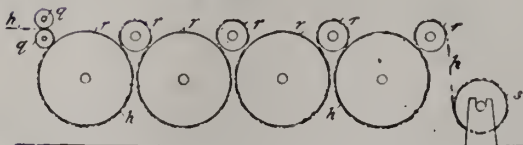


FIG 8



attached to a temporary paper backing by a layer of soluble cement, soluble in hot or cold water, or in the developer, substantially in the manner hereinabove described.

5. A complete sensitive photographic film adapted alike either for negatives or positives, or transparencies, and having colouring matter incorporated therewith, when required for special purposes, substantially as hereinbefore described.

6. A complete photographic film consisting of layers of algin, gelatine, and sensitive gelatine emulsion, said film being of sufficient strength for ordinary photographic purposes without after strengthening, substantially as hereinbefore described.

7. The herein previously described ways of making the complete film, and the various order of coatings, as also the several methods of applying the successive order of coating to counteract shrinkage and cockling of the film, and the regulated thickness of successive coatings to secure equal expansion when film is wetted.

8. The combination with alginates, algin, algulose, or similar alginous compounds, of silicates and resins for a photographic film base, substantially as described.

9. A semi-translucent film such as described, adapted to replace the ground glass of a photographic camera, and for similar purposes.

10. In the manufacture of a photographic film in a web or continuous band, the use of a temporary flexible support or web, as also the various materials used for such support or web, in the manner and for the purpose substantially as hereinbefore described.

11. In the manufacture of a photographic film in the web the use of a temporary support upon which the film may be prepared and dried, and afterwards stripped therefrom either when complete or prior to the application of the sensitive coating or coatings, for the purpose and in the manner substantially as hereinbefore described.

12. For the manufacture of a sensitive photographic web the use of an alginizing machine consisting of suitable coating devices for applying a thin alginous layer to a temporary support; a trough containing a liquid for rendering the said coating insoluble; a stock spool carrying the web of temporary support, and adapted to feed the same to the coating devices, and suitably driven friction rollers provided with flanges, and collars to grip the edges only of the web, and to draw the web continuously forward from the spool, and through or in contact with the coating devices, and afterwards deliver the moving web to the drying machine for the purpose, and substantially in the manner herein described.



13. In the manufacture of a sensitive photographic web the use of a drying apparatus adapted to receive the algin-coated web from the alginizing machine, and to dry the same by contact with heated drying cylinders, and to deliver the dried web to a receiving reel for the purpose, and in the manner substantially as hereinbefore described.

14. In the manufacture of a sensitive photographic web the looping or drying frame adapted to receive the coated web from the alginizing or gelatinizing machine, and operating to suspend the same in loops until dry.

15. In the manufacture of a sensitive photographic film, and for the purpose of suspending a coated web, and for keeping the same in motion. The use of the loopers *u* and *v*, and driving mechanism therewith, adapted to be thrown in or out of motion at pleasure, and operating to suspend the coated web in loops with a space between each to keep the web in continuous motion; and to keep the suspending points of the coated web continually changing in order to ensure an even coating until the said coating is quite dry, and to afterwards wind the same on to a receiving reel.

16. In a machine for applying coatings of liquid gelatine or sensitive gelatine emulsion to a continuous web where the said web travels horizontally along the usual form of levelling table, the use of guards projecting over the edges of the horizontally moving web to prevent cockling or curling up of the edges before the coating has set, and also in addition or in lieu thereof the use of flanged rollers adapted to press upon the edges of the web, and to keep the same flat by reason of their weight, substantially in the manner herein before described.

17. The combination of parts and devices consisting of algin coating machine insolubilizing trough, flanged rollers feeding mechanism, drying cylinders reel, gelatine coating trough, levelling table, tapes, feeding devices, looping and drying frame, looping devices, driving mechanism, endless chain, gearing, and reel, forming a complete apparatus for the manufacture of a sensitive photographic film in the web or continuous bands, substantially as hereinbefore described.

18. For the purpose of drying the photographic film in separate lengths or bands, suspending the same in the manner described, in a drying frame, weighting the bottom end of each length, and successively pushing each length forward automatically, substantially as hereinbefore described.

19. The hereinabove described process of making two films on one support by passing same successively through the various coating troughs, suspending same vertically, and drying between each coating, and afterwards stripping the two separate films from their support.

20. The hereinabove described method of separating or stripping the completed film or films from the temporary support or web by separating the same at one end, attaching the film to one reel and the support to another, and causing the reels to revolve until the two webs are entirely separated from each other.

21. The combined processes and arrangements for producing a transparent or translucent sensitive photographic film in lengths or webs ready for use in the ordinary forms of roller slides, the said webs being of sufficient strength without the addition of gelatine collodion or other backings at an after-part of the process, and free from the granularity frequently seen in films having a paper basis, substantially as hereinbefore described.

Patents stated in the Official Journal to have become Void by Non-payment of Duty. Non-payment of Fourth Year's Fee.

10,334 of 1884. J. STURROCK.—Washing Baths for Photography.

9,899 of 1884. L. A. GROTH. (*Munch.*)—Photograph Stand, &c.

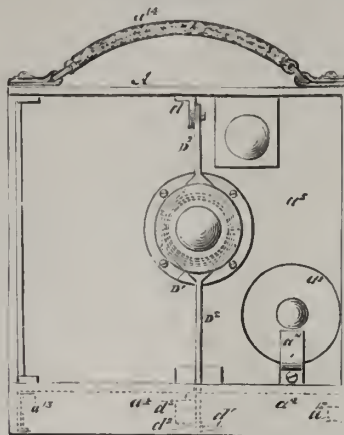
#### Patents Granted in America.

391,236. WILLARD H. FULLER, Passaic, N. J., assignor to The Scovill Manufacturing Company, New York, N. Y. "Photographic Camera."—Filed October 17th, 1887. Serial No. 252,559. (No model.)

*Claim*—1. A photographic camera having a case divided by immovable partitions into four compartments, a main compartment or chamber at the middle, a forward compartment or chamber for accommodating an adjustable lens-tube, said adjustable lens-tube receiving support from a stationary tube mounted upon the immovable partition between said compartments, a rear compartment or chamber for accommodating a plate-holder, and a fourth compartment or chamber below those

previously named and serving to contain a plate-holder, substantially as specified.

2. A photographic camera having a case divided by immovable partitions into three compartments or chambers, a main compartment or chamber at the middle, a forward compartment or chamber for accommodating an adjustable lens-tube, and having its front made in the form of a slide, and a rear compartment or chamber for accommodating a plate-holder, and having its



back made in the form of a slide, substantially as specified.

3. A photographic plate-holder having a case comprising a main compartment or chamber, and a rear compartment or chamber having its back made in the form of a slide, and having a hinged corner cover, substantially as specified.

4. A photographic camera having an adjustable lens-tube, and a lever embracing said adjustable lens-tube, and extending through the case of the camera, substantially as specified.

5. In a photographic camera, the combination of a fixed tube, a telescopically or longitudinally adjustable lens-tube fitted thereto, and a lever fulcrumed to the case of the camera at one end, and at the other end extending through the same and connected to an adjustable lens-tube between its ends, substantially as specified.

6. In a photographic camera, the combination of the fixed tube *D'*, the longitudinally adjustable lens-tube *D*, and the lever *D<sub>2</sub>*, having a yoke embracing said adjustable lens-tube, substantially as specified.

7. In a photographic camera, the combination of the fixed tube *D'*, the longitudinally-adjustable lens-tube *D*, the lever *D<sub>2</sub>*, having a yoke embracing said adjustable lens-tube, and the scale-bar *d<sub>1</sub>*, substantially as specified.

8. In a photographic camera having a case provided with a main compartment or chamber, and a chamber or compartment arranged beneath the same, a device for detachably securing a plate-holder within said last chamber, said device consisting of a bar adapted to engage the grooved side of said plate-holder, and a spring contacting with said plate-holder, substantially as specified.

## Correspondence.

### COLLODION COMPETING WITH GELATINE.

SIR,—I, and I think all your old subscribers, have read with the greatest pleasure and interest the article "Collodion Competing with Gelatine in Rapidity." It appears to me that the solution of the problem is actually, perhaps, within our reach, and I can only regret that my daily avocations prohibit me from experimenting, except on Sundays, and now and then on Saturday. If, therefore, I make bold to come forward only with words instead of facts, I do so in the hope that those blessed with more leisure for the pursuance of the required investigations may and will do so for the public benefit.

Undoubtedly the—or, at least, one of the—prime conditions of a rapid gelatine emulsion is the alkaline state of the silver bath at the moment of emulsifying; and if the most successful dry plate makers were to disclose their for-



mulæ, I would not be surprised that Dr. Eder's ammonia-nitrate of silver process, starting with a minimum of gelatine, is the foundation of all.

In Albert's collodion emulsion, as you say, Vogel notices the presence of ammonia. This may be a proof that my theory about the rapidity conferred by ammonia-nitrate of silver is correct; and the more so as this rapidity is entirely lost so soon as the plates are dry, or to put it in other words, so soon as the ammonia has evaporated. The picric acid and the eosine may be left out of our reckoning. Apparently they serve only for orthochromatic purposes, and nowhere I read that after the drying of the Albert's collodion emulsion the orthochromacy is lost, only the rapidity has gone. And many orthochromatic solutions being made up with ammonia, it is quite possible, even probable, that the homeopathic dose of ammonia, contained in the orthochromatic solution, and not the dye therein, accounts for the increased rapidity of the collodion emulsion.

Old workers with dry collodion know the great difference in rapidity between wet and dry collodion, and hundreds of preservatives were used, more or less successfully, to counteract the slowing tendency caused by the drying of the film. We are not informed whether such experiments have been made with Albert's plates, if so with what results.

We should also consider that, in the preparation of dry collodion plates, we have never followed the methods now generally used in gelatine emulsion making. When we used the silver bath, we took, as a rule, iodized collodion, with a little bromide added to it, and an acid silver bath as cold as possible. When collodion emulsion was made, fog was the great enemy to be encountered, and a minimum of nitric acid was added to the silver. Now-a-days, *nous avons changé tout cela!*—we work with a minimum of gelatine; when starting, only with bromide, or at the utmost, very little iodide added to it. We use our solutions hot or warm, and our silver is made alkaline. Nearly in every instance the reverse of our previous methods.

Next, in our collodion days, hydroquinone, hydroxylamine, the carbonates of potash and of soda, were partly unknown, partly unused as adjuncts to the developer.

Consequently, I should like to experiment as follows:—To sensitize bromized collodion plates in a warm ammonia-nitrate of silver solution, to leave them therein for fifteen or thirty minutes, to wash them thoroughly, to preserve them with one of the old preservatives—say an infusion of coffee with a little sugar—dry them, and after exposure develop them in the same way as gelatine plates.

As regards the collodion-albumen process. You may remember that Mr. Mudd, of Birmingham, was a speciality in this particular line, and, if my memory is correct, the Birmingham Photographic Society was established for the successful pursuit of this process. I also think that many instantaneous negatives were obtained at the time. The great drawbacks were the difficulty to make the film thoroughly adherent to the plate, which was overcome by albumenizing the plate before collodionizing, and next the slowness of development, which was encountered, if I remember well, by Mr. Sidebotham, who started the development by using in the first instance nothing but a watery solution of pyrogallie acid.

I am afraid that too much ammonia with the silver bath might spoil or even dissolve the albumen layer on the collodion film. But would it not be practicable to use an ammonia and water bath after the albumen has been coagulated in the silver bath?—in fact, to form the ammonia bromide of silver, in the same way as Mouckhoven and others did it successfully after the ordinary emulsifying in gelatine has taken place in the ordinary way, by the addition of a little ammonia? So far as I know, these experiments have never been tried, and for spirited amateurs, with plenty of time and a little money, they might open a splendid field for investigation, more interesting to themselves than the buying of ready-made

plates. I am not at all anxious to have my name coupled with these hints. I only want the results; you, as a chemist by profession, can better judge of the *pros* and *cons* beforehand than myself, and if you judge that there is something in them, your opinion will do more than mine.—Very truly yours.

H. L. J. HAAKMAN.

Amsterdam, 23rd October, 1888.

#### THE FRY'S PLATE COMPETITION.

SIR,—I see by NEWS I am dubbed Thos. G. White in the lucky first prize of Fry's (£20); could you set it right next week?

THOS. G. WHAITE.

43, Bank Street, Carlisle, Oct. 26, 1888.

#### PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

SIR,—On the evening of Nov. 9 the Photographic Exhibition will be open for the benefit of the Benevolent Association from 7 to 10 p.m. A lantern display at 8.45. Admission sixpence.—Yours truly,

H. HARLAND.

181, Aldersgate Street, E.C., Oct. 30, 1888.

### Proceedings of Societies.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The ordinary weekly meeting was held on the 25th ult., E. B. LAWFORD in the chair.

A series of platinotype prints were passed round by F. P. Cembrano. For purpose of comparison, four prints of each subject were mounted together. Two of these had been developed by the platinotype hot and cold process, the other two by the new printing-out process.

W. BEDFORD enquired as to the relative rapidity of the separate processes.

C. P. CEMBRANO said, the printing-out process was very slow in comparison with both hot and cold platinotype; the hygroscopic condition of the paper at the time of printing would, however, influence this to a certain extent; paper that had been allowed to get slightly damp would print quicker, and the colour of the image would be improved. He was not referring to steaming the prints, but simply letting them lay in a damp atmosphere for a short time. At one time he used to store his paper in a tin tube containing chloride of calcium; the paper becoming quite dry did not give such good results.

J. TRAILL TAYLOR referred to the old nitrate of silver and nitrate of uranium sensitising process. Excellent prints could be obtained with an exceedingly weak silver bath. Moisture in the print at the time of printing also in this case was the secret of success.

W. BEDFORD said this was true also with prints of the present day.

W. COBB had found with a flat negative that he obtained better results in platinotype by printing in strong sunlight.

J. B. B. WELLINGTON had not found any advantage from printing in the shade.

F. P. CEMBRANO said different samples of paper yielded different results. A want of vigour in a print might be obviated either by altering the sensitising materials, or by under-printing and using a very hot bath. With the printing-out process he had found a continuing action. Some prints not sufficiently printed at the close of the day were found in the morning to be overprinted. Breathing on the prints would accelerate printing.

A. HADDON contended from this that the continuing action referred to was not due to light, but that it was a developing action caused by the moisture of the atmosphere.

J. PRESTFIELD exhibited a map of the Caucasus, showing the route recently travelled by W. F. Donkin, the hon. secretary of the Photographic Society of Great Britain.

#### BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The usual meeting was held in the Priory Rooms, Old Square, on the 25th inst., E. H. JACQUES in the chair.

T. J. DAVIES, T. HADLEY, F. J. WALTON, J. H. WYNN were nominated for election.

The remainder of the evening was devoted to a lantern display of American and Canadian slides lent by the Camera Club.

A vote of thanks to the Camera Club for the loan of slides was carried unanimously.



## CAMERA CLUB.

ON October 25th, LYONEL CLARK read a paper on "The Printing Density of Negatives." A. STROH occupied the chair.

Previous to the reading of the paper, Mr. ELDER exhibited an arrangement of paper masks so managed as to be of great service in printing from film negatives and in registering.

G. DAVIDSON also showed examples of sepia-type prints which he thought were really on silver paper.

Mr. CLARK, in his address, referred in detail to the various printing processes, and distinguished the quality of negative most suited to each method. To arrive at his results, he had conducted a series of experiments with a sensitometer, and the results of these experiments he graphically delineated on the black-board, showing the curves corresponding to the effects produced with each kind of paper for comparison.

A good discussion followed, and was taken part in by the Chairman, and by Messrs. Ferrero, Elder, W. H. Green, Shipton, and Davison.

On November 8th, Lake Price will deliver an address on "Art Culture in Photography," illustrated by work, some of which was done in the very early days of photography.

## SHAFTESBURY PHOTOGRAPHIC SOCIAL.

THE second of a series of social evenings in connection with the above Club was held on Friday, October 26th, when R. AITKEN occupied the chair.

The minutes of last meeting having been confirmed, the SECRETARY read several letters of regret at inability to attend, and also several letters from photographic firms, promising assistance in various ways to the Club, mostly in the form of presenting pictures to hang on the walls of the Club room. Music and other amusements added to the evening's enjoyment.

The CHAIRMAN called upon Mr. Barnett, F.G.S., Hon. Sec. to the Cornish Camera Club, to speak. His remarks were technically very instructive and encouraging, finishing by the promise to send two enlargements to hang on the walls.

The TREASURER announced the receipt of an anonymous donation of £1 towards the expenses of the Club, and stated that the balance in hand was very fair considering the time the Club has been in existence.

Particulars, &c., as to joining, may be obtained from John B. Rintoul, Hon. Sec., 36, Brewer Street, Regent Street, London, W.

## NOTTINGHAMSHIRE AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE members of the above Association held their usual fortnightly meeting at the Rooms, Cavendish Chambers, Market Street, the occasion being a social re-union.

The President, H. BLANDY, in his opening remarks, expressed the pleasure it gave him to again accept the Presidency of the Association for another year, although he had hoped that the members would have selected another gentleman for the position, and have allowed him to retire; as, in his opinion, a change of officers was beneficial, as they were liable, if occupying an office too long, to become "rather rusty." He trusted (although his fourth year of President) not to fall into that way, as he wished to do all in his power for the success of the Association.

During the evening, G. A. BULL exhibited some very fine 15 by 12 views on the Eastman bromide paper, some charming bits of Devonshire scenery; they were very highly complimented.

J. SPRAY, J. TAYLOR, and other members exhibited some very excellent work, both in negatives and finished prints, and they were greatly admired.

The Secretary (P. E. KNIGHT) showed the American print trimmer, a very neat and useful instrument, which will no doubt become largely used by photographers, both amateur and professional.

## LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting was held on October 25, in the Royal Institution, Colquitt Street, B. J. SAYCE in the chair.

J. W. Robinson, jun., and Edward M. Tunstall were elected members of the Association.

The PRESIDENT announced that the report of the Exhibition Sub-Committee showed a balance in hand of £257 18s. He also mentioned that the Council had appointed a sub-committee to consider the best mode of dealing with the surplus.

A letter was read from Mr. Sharrock, complaining of his treatment in Switzerland by the gendarme, whilst photographing in the neighbourhood of Lausanne.

Some discussion arose as to the regulations affecting amateur

photographers in Switzerland, it being generally believed that there was no law in that country preventing amateurs from freely photographing.

The Hon. Secretary was instructed to write and ascertain the cause of Mr. Sharrock's ill-treatment.

W. H. KIRBY showed some remarkable results of pressure producing upon the developed film dark streaks as of the action of light. In one example his initials were developed which had been written in the dark room by mere pressure of the finger nail.

Mr. SAYCE stated it was well-known pressure or friction affected the sensitive film. He had met with examples of this occasionally occurring at two or three regular intervals of space in the last exposure surfaces of films in the Eastman roll holders, and considered it entirely due to pressure of the grooved tin by which the paper is attached to the spool, which, perhaps, in these instances might, by accident, have projected beyond the circumference of the spool; and he suggested that irregular pressure of packing paper might frequently be the cause of otherwise unexplained stains or markings on glass plates.

Mr. CHRISTIAN exhibited a detective camera designed to serve as an ordinary camera when desired.

A demonstration of "Micro-photography" had been announced as the principal subject of the evening's proceedings, and a large audience had assembled; but, owing to an unfortunate misunderstanding, the demonstrator did not arrive, having, as was subsequently ascertained, mistaken the evening.

In his absence THOMAS COMBER kindly exhibited some micro-photographs magnified five hundred diameters, mainly diatoms; these were taken with Zeiss' apochromatic objective of three millimetres, also one of *Navicula praelata*, which had been magnified one thousand times. He recommended the hydroquinone developer for microscopic work. Mr. Comber also gave a brief description of the mode of illumination adopted by him, and exhibited a prism used for reflecting the light, which gives an illumination preferable to that from a mirror; also an objective, by Swift, specially adapted for photographic work, having a collar adjustment for distance of sensitive plate from the object.

Mr. HEATHER, on behalf of Mr. Atkinson, exhibited some specimens of a process called "opalocryst," consisting, apparently, of prints mounted on convex opals, the central portion being ground down to form a surface for the reception of the print. The effect thus produced seemed very good.

## DEVON AND CORNWALL CAMERA CLUB.

THE adjourned meeting was held at the Royal Hotel, Plymouth, on Saturday afternoon, 27th Oct., J. PODE in the chair.

Letters were read from Col. Haseltine and others, excusing their absence. Twelve new members were elected.

The proposed rules which had been drawn up by the committee were considered, and finally passed as follows:—

1. This society shall be called "The Devon and Cornwall Camera Club."

2. The Club shall have for its object the advancement of the science and art of photography, as well as the recreation of its members in that subject.

3. The Club shall consist of amateurs desirous of practising photography in any of its branches, as a recreation.

4. The affairs of the Club shall be governed by a council of fifteen members, consisting of the president, four vice-presidents, hon. secretary, hon. treasurer, and eight councillors.

5. The council shall be elected at the annual meeting to be held on the last Saturday in September.

6. At any meeting of the council, five shall be a quorum.

7. In the event of any office becoming vacant, the council shall have power to fill it until the next annual meeting.

8. The council shall retire annually, but shall be eligible for re-election, with the exception of one vice-president and three councillors, who shall retire in rotation, and not be eligible for re-election for one year.

9. Meetings shall be held at such time and place as the council shall appoint.

10. A special meeting shall be convened upon a requisition to the secretary, signed by not less than five members, and specifying the object of the meetings.

11. The names of proposed new members shall be sent to the secretary on the proper form, with those of the proposer and seconder, and signed by the candidate; and such form shall be posted in the Club Room at least seven days before election, which shall be by ballot at a general meeting, one black ball in five to exclude.



12. Each member shall, on election, pay an entrance fee of 10s. 6d. (the first 100 being exempt); and an annual subscription of 10s. 6d. Officers of the army and navy, on the active list, to be exempt from payment of entrance fee.

13. All subscriptions shall become due in advance, on the annual meeting in each year; but a member elected after May 31st in any year shall not be liable to pay a second subscription until the second annual meeting after election.

14. No member shall be allowed to take part in any of the proceedings of the Club, or use its premises, until his subscription for the current year, and all other monies he may owe to the Club are paid.

15. Should any member's entrance fee, of subscription, remain unpaid one month after it is due, the treasurer shall notify the fact to such member and post his name in the Club room; and if it is still unpaid one month after posting, such member shall cease to be a member; unless, for sufficient reason, the council shall think proper to extend the time allowed for payment.

16. Any member who may be absent from the counties of Devon and Cornwall during the whole period covered by the annual subscription, may, by giving notice to the secretary, be considered as a supernumerary member, and be exempt from subscriptions falling due during his absence.

17. Any member wishing to withdraw from the Club shall give notice in writing to the secretary, and pay all monies owing by him to the Club, before or at the annual meeting, otherwise he will become liable for the next annual subscription.

18. Any member may be expelled by a vote of the majority of the whole council.

19. Voting on all occasions, except where otherwise specified, shall be decided by a majority of the members present, the chairman having the power to decide by a casting vote in addition to his ordinary one. Ten to form a quorum.

20. Honorary or temporary members or visitors may be admitted by the council on such terms as they shall think fit.

21. No alteration nor addition to these rules shall be made between the months of March and September (both inclusive) unless carried unanimously at two meetings.

Captain Tudor-Jones, R.N., and A. A. Carnell were elected, and accepted the posts of hon. secretary and hon. treasurer respectively. The election of the president, three vice-presidents, and three councillors was left in abeyance for the present. John Pode was elected vice-president, and W. Gage Tweedy, R. Murray, G. Soltau-Symonds, Major Barrington-Baker, and Dr. Aldridge, were elected councillors.

A vote of thanks was accorded to Captain Tudor-Jones for his services in starting the Club.

A number of letters were read from persons taking an interest in photography, and it is confidently expected there will be a large increase in membership now that the rules, subscription, &c., have been decided upon.

There will be a lantern meeting on Wednesday, Nov. 7, when W. Gage Tweedy will give a lecture on "Lantern Slides" at Messrs. Skardon's Rooms, kindly lent by Mr. Carnell.

## Talk in the Studio.

SHAFTESBURY PHOTOGRAPHIC SOCIAL, Craven Lecture Hall, Foubert's Place, Regent Street, W.—In connection with this club, a lantern lecture will be given on Friday, November 16th, at eight o'clock, in the Craven Lecture Hall, Foubert's Place, Regent Street, by T. C. Hepworth, the lecture being entitled "Old and New London."

ARTS AND CRAFTS EXHIBITION SOCIETY.—A series of lectures in connection with the Arts and Crafts Exhibition is arranged in the New Gallery, on Thursday evenings in November, at 8.30 p.m. Last Thursday, November 1, "Tapestry and Carpet Weaving," William Morris; Thursday, November 3, "Modelling and Sculpture," George Simonds; Thursday, November 15, "Letterpress Printing," Emery Walker; Thursday, November 22, "Bookbinding," T. J. Cobden-Sanderson; Thursday, November 29, "Design," and Presidential Address, Walter Crane. The object of the lectures is two-fold: (1) to set out the aims of the Society; and (2) by demonstration and otherwise, to direct attention to the processes employed in the Arts and Crafts, and so to lay a foundation for a just appreciation both of the processes themselves and of their importance as methods of expression in design. The lectures will be given in the North Gallery, and after each lecture all the galleries will be thrown open, and will remain open till 11 p.m. Admis-

sion by ticket. Price for a single lecture, 2s. 6d.; for the course, 10s. For the admission of workers in any Art or Craft, tickets, to be filled in with the name, address, and Art or Craft of the worker, will be issued at 1s. each, or 25 for 20s., each entitling to admission to a single lecture. Exhibitors, artists, and craftsmen mentioned in the Index to the Catalogue may have tickets free on application. Doors open at 8 p.m.; chair to be taken at 8.30 p.m. Further information, if desired, to be had of the Hon. Lecture Secretary, T. J. Cobden-Sanderson, Hendon, N.W.

THE CAMERA CLUB.—We have received from the Secretary the following list of forthcoming meetings, commencing at 8 p.m. Thursday, Nov. 1, "Toning, both Silver and Bromide Papers," by H. M. Elder, M.A.; Monday, Nov. 5, Smoking Concert; Thursday, Nov. 8, "Art Culture in Photography," by Lake Price; Thursday, Nov. 15, Lantern evening; Thursday, Nov. 22, "On Development," by J. Cadett; Thursday, Nov. 29, "A Lesson in the New Cold Bath Platinotype Process," by Mr. Willis; Thursday Dec. 6, "On Single and Stereoscopic Head Cameras with Lantern Slide Illustrations," by E. R. Shipton; Thursday, Dec. 13, "On Photographs of Nebulae," by Professor A. A. Common, F.R.S.

THE YORKSHIRE COLLEGE PHOTOGRAPHIC CLUB.—From the Secretary, Harry B. Hall, of 20, Regent's Terrace, Hyde Park Road, Leeds, we receive the following programme of arrangements:—November 29th, discussion on "Lantern Slide Making"; December 20th, Conversational meeting; January 25th, 1889, Lantern exhibition; February 23rd, Discussion on "Fine Art in Photography"; March 5th, Student's Association Soirée; March 28th, Micro-photography—Mr. Pocklington; May 2nd, Conversational meeting; May 30th, Discussion on the "Newer Methods of Printing"; June 27th, Conversational and annual meeting. The meetings are held in the College Buildings at 7.30 p.m. Excursions to places of interest during the summer months.

THE PHOTOGRAPHIC CLUB.—The ninth annual general meeting of this Club will be held at the Club rooms, Anderton's Hotel, Fleet Street, E.C., on Wednesday evening, November 7th, 1888, after the technical business of the ordinary meeting is disposed of.

## To Correspondents.

A READER.—The ordinary negative varnish can be removed by repeatedly flooding the surface of the plate with alcohol (methylated spirit will answer). In the case of a gelatine negative, the action of the spirit may be assisted by gentle friction with a tuft of cotton-wool.

JOHNSON and HOTTMANN.—The cause is probably that which you conjecture.

AMATEUR ENLARGER.—You will find details in Abney's "Instructions" and in the current YEAR-BOOK.

CRUX.—1. The precipitate is a mixture of chloride of silver and chloride of lead, and we are inclined to think that the best thing to do will be to repeatedly boil it in water, so as to dissolve out the chloride of lead. After each boiling, and while the water is still hot, collect the chloride on a calico strainer. When hot water extracts no more, reduce the chloride by fusion with carbonate of soda. 2. You have lost sight of the fact that the ounce of silver weighs 430 grains, while the ounce of silver nitrate weighs only 437½ grains.

E. V. B.—Your communications to hand, and we are much obliged to you for them. The paper shall be translated and used as you suggest.

BICHROMATE.—Smooth and hard-faced paper will not answer at all; an unsized or only slightly sized paper being required. Stout white blotting-paper of moderately good quality gives an excellent result, but handling it while wet requires care.

LOUIS KENNEDY.—It is so purely a matter of taste, and, so far, is out of the range of dispute; but, generally speaking, a person who uses such terms as those you refer to, uses them for lack of ideas.

PRINTER.—The man is a swindler, who has assumed the name because he supposes it will carry some little weight among photographers.

COLLODION.—Probably the bath is contaminated with organic matter. Making alkaline, and exposing to sunlight for a long time, often proves a remedy. Before using again, filter, and make slightly acid with nitric acid.

R. A.—If you make the gold impression with type, brass types are almost essential, and they can be obtained at Caslon's type foundry, Chiswell Street, London. If, on the other hand, you wish to have a block cut to a special design, let it be engraved on brass. The common bronze printing is generally done by lithographing on the cards, and then dusting with bronze powder.



# THE PHOTOGRAPHIC NEWS.

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## PHOTOGRAPHERS' GRIEVANCES IN CANADA AND THE UNITED STATES.

### THE "PROTECTION" QUESTION—SUGGESTIONS AS TO COPYRIGHT.

FROM time to time we have directed attention to the discussion which is going on in Canada on the subject of protective import duties on dry plates and other photographic requisites, and we now quote an article from the *Toronto Mail* of October 8th, in which regret is expressed that in spite of the repeated complaints of Canadian photographers, nothing has been done to remove the burden complained of.

The following is the article of the *Toronto Mail* to which we have just referred:—

The Finance Minister seems to have turned a deaf ear to the petition of the photographers of Canada for relief from the specially burdensome taxation which under the mask of protection has been imposed upon them. We have already pointed out how unjustifiable is the specific duty of fifteen cents per square foot levied upon photographic dry plates, a duty which presses most heavily against the cheapest grades of plates, and discriminates against the English in favour of the American article. We have also shown that on certain lines of English plates the duty amounts to a tax of 100 per cent. on their value; that the persons employed in the manufacture of dry plates in Canada are so few, about a dozen all told, that it is absurd to tax the large class of photographers for their supposed benefit; and, finally, that the home brands are inferior in quality to either the English or American goods, and that in cases where the duty forces sale it is at the cost of inferior photographic work on the part of the purchasers. There is another item on the tariff affecting photographers in reference to which, as in many other instances, the Government have altogether ignored the fact that for certain businesses or for manufactures special localities are specially adapted. We refer to albumenized paper, of which immense quantities are imported into Canada for the use of photographers in making prints from their negatives. The paper, of which a special quality is required for albumenizing, is made in France at the Rives factories, while the process of albumenizing is carried on at Dresden. All over the world this paper, made in France and coated at Dresden, is used by photographers as giving the best results. The United States Government have in fact recognized that this paper can neither be made nor albumenized in America to advantage by reducing the duty 35 per cent. to 15 per cent., the present tax. The Dominion tax on albumenized paper is 35 per cent., a very heavy impost, seeing how largely the material is used by photographers. There is no good reason for keeping the duty at this figure, seeing that no attempt is made, or is likely to be made, to manufacture it in this country. The only excuse which has been suggested, and an extremely ridiculous one it is, for retaining the present duty, is that the process of albumenizing the paper requires millions of eggs, and the duty might stimulate capitalists to embark in the enterprise of manufacturing the article, thereby giving employment and protection to the Canadian hen.

Another matter which is exercising the minds of the

New World photographers just now is that of copyright; and the North American photographers are now asking, Why should a literary man have a general copyright over all his productions, but a photographer only a copyright on the registration of each separate item?

The case for a general copyright on *all productions* is well stated in a paper recently sent out by Falk, of New York, and the American view is largely applicable to the condition of things over here; consequently we reprint the whole of the document referred to:—

The purpose of this communication is to direct the attention of the representative photographers of the United States to a subject of much importance to them, and to elicit their opinions upon it. An early response, in the form of a signed answer to the questions on the enclosed slip of paper, is requested.

Among the laws created by legislation for the protection of the property of individual citizens, there should be one somewhere adequate to the preservation of the rights of the photographer in his own work; but, as yet, none such exists. The general copyright laws, to which he can alone appeal, although, perhaps, sufficient for the needs of the art in its earlier days, are now utterly inadequate, because they entail upon the photographer who would avail himself of their protection an enormous and almost prohibitory amount of trouble and expense, since they demand that every photograph which it is desired to protect shall be specially and individually copyrighted; thus necessitating, in each case, the printing of the title of the subject of the picture, which must be sent to Washington, together with the copyright fee and two copies of the finished picture. When one considers the thousands of photographs which every prominent photographer of the present day would wish to protect—and to the protection of which, as the result of his study, labour, and artistic knowledge, he has an undeniable right—it becomes easily comprehensible that the present conditions, simple as they seem when considered in reference to a single picture, become by multiplication an unbearable burden—a burden, indeed, so heavy that there is to-day not one photographer in the land who does not prefer to run the risk of having his pictures pirated to going through with the troublesome and costly details of copyrighting them.

Twenty-four years ago, when the copyright laws were first amended so as to embrace photographs, the situation was totally unlike that of to-day. The number of photographs made was exceeding small as compared with the present time; lithography and the other pictorial arts, which now regularly prey upon the photographer's products, were but little used or entirely unknown, and the photographic work of those days was, as a rule, too crude and inartistic to offer any temptation to pilferers. Consequently, the necessity, now so pressing, of so framing the law that it might feasibly protect the photographer as well as other brain workers, was not at all comprehended; it was barely suspected. To-day it is hardly an exaggeration to say that most of the other reproductive pictorial arts derive their main support from the photographer's works, and this without making him any return in either money or reputation, for in ninety-nine cases out of one hundred the appropriator (to put it politely) does not even give credit to the man whose ideas he appropriates, and in the



hundreth case the pirate considers himself such a marvel of honesty and liberality in confessing his obligation, that the idea of sharing the profits with the photographer who created the original does not even enter his head. Thus it is that annually thousands upon thousands of pictures, representing the best ideas, the highest skill, and the greatest artistic inventiveness of the photographer, are seized upon by the workers in the reproductive pictorial processes, who treat this pirated property as though it were honestly their own; making and selling copies for their own enrichment and advertisement, and, as the copyright laws now stand, the victim is practically as powerless to prevent, as he is unable to obtain redress for, the wrongs he suffers. He cannot prophetically foresee just which of his pictures will strike the fancy of the professional plagiarist, and, by copyrighting just those, save them; and he certainly cannot, in view of the enormous expense now involved, copyright all of the thousands of pictures he makes every year.

And here we reach the suggestive point. Why should not the law provide a feasible method for copyrighting all the pictures he makes, if he so desires?

As has been already stated, the individual copyrighting of his thousands of pictures is practically an impossibility; but why should not the photographer, by an amendment to the present copyright laws, be enabled to guard all his work from the infringer by the payment of an annual copyright fee?

It is not proposed that the present copyright law shall be done away with; the photographer who desires only occasionally and at long intervals to copyright an individual picture would still have the right by the present method to do so; it is only intended, by the proposed amendment, that the man who wishes to avail himself of the privilege shall also have a feasible method of protecting all his productions. The payment of this annual fee should bestow upon the photographer the right to print upon all his mounts the notice of copyright.

By correspondence with the librarian of Congress, it has been ascertained that the total amount received by the Government last year from photographic copyright fees was only \$3,000. Were the annual fee adopted, proposed above, though it were made only \$100, there is little doubt that many times three thousand dollars would accrue to the Government from this source alone; and there is certainly no photographer, at all prominent in the profession, who would not gladly pay that amount—or, if necessary, even several times that amount—to secure to himself the full benefits of his labours.

As a moral consideration, it might be added that our piratical friends would by this means be legally forced into honest courses; and, as a business consideration growing out of that, it might be further suggested, that they would eventually find themselves the better off for it. For, when a lithographer or other copyist saw a picture which he considered worth reproducing, he would purchase from its originator the right of such reproduction; and, having thus become sole owner of that right in that picture, he would be able to insure his customers against rival imitations, and thus receive a better price for his work.

Much more might be said, and of importance; but it is probable that enough has been suggested to convince the members of our profession of the pressing necessity for some reform in this matter.

It only remains, therefore, to add that the writer has been fortunate in so interesting one of our most prominent and able legislators in this subject that he has promised to introduce it at once to Congress, if sufficient data are furnished to enable him properly to advocate the proposed amendment. It is this promise which has drawn out this address to you; and it is in consequence of it that your speedy answer is requested to the inclosed queries. You will confer a favour if you will fill up and return the enclosed slip at your very earliest convenience, along with whatever other suggestions you may be pleased to make.—*New York, October 17, 1888.*

#### A SIMPLE METHOD OF TESTING PHOTOGRAPHIC MOUNTS.

BY E. W. FOXLEE.\*

THERE is no question whatever that with all the improvements which have been made in photographic processes, silver prints are still as fugitive as ever—some say more so. I shall not here refer to the different causes which may conduce to fading, but simply confine myself to one—and, I believe a prolific one—

namely, the mounts. A large number of those now in the market are, undoubtedly, totally unfitted for photographic purposes, and, if silver prints be mounted upon them, permanence must not be expected. I need not dwell upon the hardship that is inflicted upon a professional photographer, who takes every precaution in the fixing and washing of his pictures in order to make them as permanent as possible, when he is supplied with mounts which contain such deleterious matters as will render all his care abortive. His reputation and business must necessarily suffer, and seeking redress in a court of law, although he may gain his cause, is not always satisfactory. The mounts, it is true, might be submitted to an analytical chemist before they are taken into use, but this would be somewhat costly, and moreover the vendor could, and probably would, dispute as to whether certain matters which might be discovered in them would act injuriously upon a photograph. Scientific evidence in a law court is usually conflicting—as witness that given before the referee in the case of *Downes versus Fallowfield*, a suit which, I believe, is still *sub judice*.

The object of the present paper is to lay before the Club a simple "rough and ready" method by which anyone unacquainted with chemistry may determine whether mounts contain anything that will act injuriously upon the photographic image. I take it that, as a rule, photographers do not care what may be the nature of the deleterious matters, it being sufficient for their purpose to ascertain if any at all be present.

The method I am about to describe is one I have had in use for some time, and is similar in principle to the excellent one described in the last number of the *PHOTOGRAPHIC NEWS*, though it is put into practice somewhat differently. The method there given is to mount a print on pieces of the mounts to be tested in juxtaposition with a piece of mount of known purity, and then keep in a damp condition. My plan is to keep the face of one part of a print in close contact with the mount to be tested, while the other portion is insulated from it with an impervious material, the whole being retained slightly damp, and, if possible, in a moderately warm place. We all know that a silver print subjected to this trying ordeal will, sooner or later, succumb. But if that portion which is in contact with the mount changes quicker than the other, it is evident that the mount must be the cause of the deterioration. If, however, the picture fades evenly all over, the mount may reasonably be considered suitable for its purpose. This plan, I fancy, possesses some little advantage over that described in the *PHOTOGRAPHIC NEWS*, inasmuch as the face of the print, instead of the back, is in contact with the mount, so that the effect, if any, is produced with greater rapidity. Furthermore, no mountant is used which might prove a bone of contention. In the recent suit, *Biddle versus Fry and Co.*, it was contended that starch was an improper cement to use with the mounts in dispute.

The procedure I adopt is as follows:—Take a light print, made preferably from a thin negative, and damp it, together with a piece of pure paper, such, for example, as Joynton's writing paper. Now, on the mount to be tested put two or three thicknesses of paraffined paper so as to cover, say, one-half of it. Then place on the print, face downwards, on that the writing paper, and secure them in position with a couple of paper fasteners. Next back up with a pad of damp, not wet, blotting-paper, and place between two pieces of glass to prevent the moisture evaporating, and put under heavy pressure.

The print should be examined daily. Sometimes—in an hour or two even with some mounts—the print will show a stain from soluble colour diffusing itself from the mount. Here is an example. This print showed a stain in less than a couple of hours, yet, at the end of seven days, although that half which was in contact with the card had become dyed a decided red, there is no actual fading of the image itself. The dye has not acted destructively on the image. Here, however, is another sample of board, where the staining, after seven days' contact, is far less than in the other case, but the image has been almost completely destroyed. In the next two examples—eight and ten days' contact—it will be seen that there is very little, if any, staining, though there is very strong evidence of fading, and this began to show itself on the second day. Here are two more specimens which, after ten and eighteen days respectively, although they are somewhat stained, the image itself appears to be intact. All these mounts, as you see, are the dark enamelled and more expensive kind.

Here are two common cards with a surface somewhat similar to the more costly ones just shown, printed with brouze, which were not intended for photographic purposes. In each case the

\* A Communication to the Photographic Club.



bronze lettering shows on the photograph, yet the image is otherwise unaffected, except that in one it is very slightly tinted. Both were kept in contact for three weeks. The next specimen is a white enamelled card which, after twenty days, has produced no injurious effect, though the enamel, in places, adhered to the print, and has since been washed off. The portrait on the other side of this card has been there for about fourteen years. This is a very cheap and common cream-toned board, not enamelled, which, after fourteen days, shows no injury whatever, although the print is an exceedingly delicate one. Here is another plain board of the cheap kind, which by the treatment has become mouldy and so spotted the print, but has not otherwise injured it after fourteen days' contact. As the mould made its appearance in a few days I conclude that the paste, or the material used for the card, must have contained the germ.

I could have brought forward many other examples had time permitted; but as I promised a short paper I will not inflict them upon you. What I have shown, I think, has been sufficient to prove that the method described is a simple yet efficacious one, and that photographers need not consider themselves quite so much at the mercy of the mount makers, and what they supply, as hitherto.

### ORTHOCHROMATIC PHOTOGRAPHY.

BY CAPT. ABNEY, C.B., R.E., F.R.S.\*

Now let us see what is the effect of light on one of these dyes. If we dip plain paper in a weak solution of such dyes as eosine, magdala red, cyanine, &c., we shall find that when exposed freely to the air and sunlight the colours will rapidly fade; but for the purpose of examining them in the state in which they are to be found in a plate, it is very convenient to make an inert emulsion in collodion or gelatine, and then to add the dye to the emulsion. This may be done by adding sulphate of baryta to collodion, or by dissolving in it chloride of calcium, coating a plate, and immersing in sulphate of soda. The plate can then be dyed with dye, after pouring over it methylated spirit. A very good inert emulsion in gelatine may be made by dissolving in gelatine barium chloride, and precipitating the sulphate of baryta by means of sodium sulphate, slightly washing, and then adding the dye. For experiments in which collodion is the vehicle it might seem sufficient that simply dyed collodion should be flowed over an opal plate and the results noted. It is sufficient to a certain extent, but not so satisfactory as when a grain is in the collodion, since the action of light is very much more marked where the surface of the dye is as large as possible. Plates coated with these dyed emulsions will be found to behave similarly to the dyed paper; in both cases the dye will be acted upon more readily than where it is merely imprisoned in a film. In the case of some dyes the colour will bleach, whilst in others the change will be less marked. It must not be assumed, however, that because the colour is only slightly altered that therefore the change is less real. It is quite possible that a chemical change may take place in a dye though its colour may remain unaltered to the eye. We will revert, however, to the spectrum, and endeavour to see what it teaches us.

If we have a fugitive dye—cyanine, for instance—staining an inert collodion emulsion, and place a plate prepared with it in a bright solar or electric light spectrum, a very marked action is soon seen: a bleaching takes place in the orange and yellow, the remainder of the plate being nearly unacted upon. If a weak solution of the dye be placed in front of the slit of the spectroscop, and the spectrum which is now upon the focussing screen of the camera be carefully examined, it will be found that those rays which caused the film to bleach are either wholly or partially absent. This proves the fact that the dye is only chemically acted upon by those rays which it absorbs. We will now trace to what this change is due. If we take a piece of mica and coat it with the dyed and inert collodion emulsion, and place it in a tube and exhaust the tube, seal it up and place it in the light, it will be found

that no bleaching takes place, though it be exposed for months to the brightest sunlight. I have had a tube containing paper dyed with cyanine exposed, more or less, for five years to the brightest light, and it remained totally unaltered in colour. If, on the other hand, we expose similar paper freely to the air, particularly moist air, the film will bleach in a few seconds in sunlight. We may ring the changes on the exclusion of moisture and oxygen, exposing in tubes free from one of them, and in the presence of hydrogen and nitrogen; and the only conclusion that we can arrive at is that the bleaching is an oxidation of the colouring matter. Indeed, ozone or hydroxyl without light will bleach cyanine thoroughly. The exposure of other dyes which are found to have a sensitizing action on the silver salt in the same manner will give similar results. Hence we are driven to conclude that the result on all is an *oxidizing* action.

When we use alkaline pyrogallie acid to develop a plate, the pyrogallie acid becomes oxidized, and it is during its oxidation that the silver salt is reduced. There is a tendency for the oxidized products to absorb the haloid in the silver compound, and so to make the resulting compound more stable. In the same way we may look upon it that during oxidation of the dye the same tendency exists, and the minute quantity of reduced silver acts, as I have said before, as a nucleus on which development takes place.

The action thus traced is analogous to that which I remarked in an old experiment made by myself. It is this. If a sensitive chloride or other plate be flowed over with ferric oxalate and exposed in the spectrum, then on development with ferrous oxalate there is a different spectrum produced to that developed when the ferric oxalate is omitted. There is an increased action in the green-blue, and a diminished action in the violet, to which the chloride is normally very far more sensitive when exposed in the usual manner. The explanation of this is very simple. The ferric oxalate is sensitive in the green-blue, and is there reduced to the ferrous state, which partially reduces the salt in contact with it. In the extreme violet, the ferric oxalate is less acted upon; and what is not acted upon tends to destroy the photographic action which has there taken place. If the ferric oxalate were neutral as regards the destruction of the image, we should in this case have an exact counterpart of the dye, the only difference being in the locality of the spectrum absorption of the two.

Dr. Vogel's views of the action of the dyes apparently differ considerably from mine, and Dr. Eder seems to agree with his view of the action that takes place. Mr. Bothamley, who has written a most able paper on the subject of which I am treating, sums up Dr. Eder's ideas in a very succinct manner. This excellent experimentalist considers (so says Mr. Bothamley), that "the dye unites with the silver bromide to form a molecular compound of the nature of a lake. The action of the light on the dye and the silver bromide is simultaneous. The compound of the bromide and the dye absorbs the light rays, and the energy which existed as wave motion is communicated to the molecules of the compound. The molecules are thereby thrown into such energetic vibration that their equilibrium is disturbed, and the silver bromide is either decomposed into bromide and silver sub-bromide, or is brought into that state of unstable equilibrium in which it is readily acted upon by a reducing agent such as constitutes an ordinary developer. When the light rays are absorbed by the dye alone, the waves for the most part undergo *photo-thermal extinction*, and their energy is transformed into heat, a small proportion undergoing *photo-chemical extinction*, and being used up in producing chemical decomposition, since the majority of dyes are slightly altered by light. When, however, the rays are absorbed by the dyed silver bromide, the greater part of the wave undergoes *photo-chemical extinction*, and their energy is used up in decomposing the silver bromide, whilst only a small portion undergoes *photo-thermal extinction*."



I should like to make a few remarks on this explanation.

Radiation (or light, if you like to call it so) consists of undulations which are capable of doing work of some kind on a body on which it falls. The work may be heating the body on which it falls by the absorption of rays, or chemical action by decomposing such a body, or both. This is what is translated as photo-thermal extinction and chemical extinction. Now, from the above it is evident that Dr. Eder considers that when dye alone receives the light, there is much photo-thermal extinction (or heating of the body), and but little photo-chemical extinction (or chemical decomposition of the body); but directly the dye is in contact with the bromide, the two extinctions are reversed, and that chemical action is in the ascendant, and the silver bromide is decomposed. In other words, it comes to this, that the heating of the dye—for mark that as the dye is not chemically combined with the bromide, the work done in it must be identical with that which would be done were it not in contact with the bromide—does chemical work in the bromide of silver. If this were the case, a hot iron applied to the back of the plate should be quite as effective. If the silver was a real chemical compound with the dye, such an explanation, with modifications, might be the case; but we are not dealing with a chemical compound in the case of a lake, but only with a mechanical compound—a very widely different thing. It is for this reason that this explanation does not recommend itself to me.

(To be continued.)

#### NOTES FROM NEW YORK.

NEW YORK AMATEUR SOCIETY—TONING BLUE PRINTS AND GELATINO-CHLORIDE PAPER—NEW APPARATUS—TALK ON PHOTOGRAPHY.

At the regular meeting, on October 9th, of the New York Amateur Society, several things of interest were exhibited.

President Canfield read a short paper on toning blue prints, accompanying it with numerous specimens. He had experimented with a formula taken from a French publication, and found that the time for toning took, on an average, about ten minutes, while the author of the formula stated that it could be done in three or four. By painting the toning solution on parts of a picture with a camel's hair brush, very peculiar and interesting results were obtained. The background could be made of a different tint from the main parts of the picture, or *vice versa*. The print is first wetted with water, then immersed in the toning bath, and finally washed for about fifteen minutes in changing water. The formula for preparing the toning bath, which it was said would keep well, is as follows:—

Borax ... ..	70 grams.
Warm distilled water ..	1,000 c.c.

Acidify by adding sulphuric acid until the solution turns blue litmus paper red, then restore alkalinity by the addition of liquor ammonia until red litmus paper turns blue, and finally add gum catechu, 10 grams.

James H. Stebbins, junr., exhibited several prints on Obernetter's gelatine chloride of silver paper, which he thought was easier to work than albumen, and, if anything, brought out the finest details and gradations in a negative superior to albumen paper. By experiment he ascertained that it was better to keep the gold solution separate, instead of mixing with the other ingredients as advised in the printed directions. His improved formula is as follows:—

No. 1.	
Water ... ..	1,000 grams or c.c.
Acetate soda (fused) ...	40 „
Sulphocyanide of ammonium ...	20 „

No. 2.	
Water ... ..	1,000 c.c.
Chloride of gold ... ..	1 gram.

The total is prepared whenever you wish to tone a batch of prints as follows:—

No. 1 ... ..	200 c.c.
No. 2 ... ..	60 „

Unlike ready sensitised silver paper, which is generally so uncertain in toning, this new paper tones quickly and gradually, and is very easily stopped at any desired tint. Mr. Stebbins remarked that the prints should be kept in the bath until they appear blue throughout when examined by transmitted light. The appearance on the surface must not be taken as a guide. The prints do not fix out like silver. They have a higher gloss, and are readily burnished. Several specimen prints were passed round.

Mr. Beach remarked that he had tried the same paper, and obtained very good prints. It toned easily, was much more rapid than ordinary silver paper, and kept well. He concurred in all that Mr. Stebbins had said about its good qualities, and preferred the acetate bath to any other. He also exhibited three or four prints made on the new printing out platinotype paper just brought to him by a friend from abroad, which excited some interest. It was, he thought, the simplest and best paper that had been got up for making proofs from negatives, and for certain kinds of pictures. The tone resembled that of an old steel engraving. The paper is sold ready prepared, prints as quickly as ready sensitised paper, and keeps about as well. It is printed up to the depth wanted, then removed from the frame and immersed for a few minutes in a very dilute solution of hydrochloric acid and water; in a few minutes the yellow salt unacted on by light dissolves out, and after a short soaking in water the print is dried ready for mounting or delivery. Nothing could be more simple, and it will certainly not be long before the paper will be introduced by some energetic American house.

A Mr. Smith showed a number of negatives on the new celluloid film made by Allen and Rowell, which were of considerable merit; he stated that they could be worked more easily than glass, were sensitive enough for instantaneous exposures, but developed somewhat slower than ordinary plates. A discussion arose as to holders for holding the films in plate holders. It was said a special holder was about to be devised, but one gentleman thought if the film was slid in the holder and backed by a black sheet of cardboard it would be sufficient to spring the film forward enough to occupy the focal plane. Others remarked that the film might bulge out in the centre, and thus rub against the slide of the holder. But those who had used the film found that it would keep flat enough if well clamped. The high price of the films (about double that of plates) was explained by the fact that celluloid is a patented article, and the manufacturers are not disposed to lower its cost until compelled to by competition.

Dr. Piffard exhibited three negatives and prints of orthochromatic subjects which showed progress in that direction. A recess was then taken, prior to which the President made several announcements, one being that a field excursion to Gettysburg was proposed.

During the recess members inspected quite an array of apparatus, sent for exhibition by different parties. Among the things sent by Mr. Murphy, we noticed Seed's vignettes, an improved paper cutter, Green's shutter (intended mainly for studio cameras), one of Adt's improved printing frames and wire support, which is an excellent idea, a Stoddart print roller, an Eagle rapid rectilinear lens, and a Success preserving box, for preserving prepared silver paper. A few of these things were presented to the Society.

W. S. Bell and Co. sent for inspection a variety of Russian lenses called the "Prazmowski," which are noted



for the great width of angle they include, and remarkable depth of focus.

The Scovill Manufacturing Co. had on exhibition a Waterbury Detective Roll Holder Camera, and presented to the Society a screen and standard for use in setting off the magnesium light.

A Monocular Duplex Smith Camera was shown by Mr. Peebles Smith, so fixed that the image can be seen the full size it is to be taken until the second exposure, when the shutter operates and takes the picture. The image is reflected upward on a horizontal ground glass by a mirror placed in front of the lens. The apparatus was neatly made, and attracted considerable attention.

It is reported that the Society is to purchase new apparatus for the studio, and devise means by which lantern slides may be made in the camera at night by artificial light. The Society's optical lantern is also to be improved.

On the 19th Mr. George G. Rockwood gave an interesting practical talk on "Photography," before a crowded audience, at the Young Men's Christian Association, in Twenty-Third Street, and showed some phototype plates illustrative of the latest progress in this direction; also a composite photograph of nine young ladies. He successfully made a portrait photograph on the stage by the magnesium flash-light, and immediately developed the plate, which turned out satisfactorily enough to show the idea. He explained that he was the first photographer in this country to make the C.D.V. photograph. The Kodak camera was shown as one of the latest phases in apparatus for instantaneous work, also films stripped from the paper. Following his remarks was a brief lantern exhibition, which proved to be quite entertaining; and last of all he took to photograph the audience, probably successfully so far as the cameras are concerned, but we fear the portion of the audience at a distance failed to impress the plate. Two cameras were fixed on the stage directed towards the two opposite corners of the room, and in the centre of the stage was a large flat tin reflector, about 5 feet long by 3 feet long by 3 feet wide, having a trough-like lip bent up at the bottom along the entire length. In this was spread gun-cotton, covered with a quantity of magnesium powder, and over it was placed a second film of gun-cotton. At the critical moment an assistant, holding a lighted wax taper on the end of a rod about 5 feet long, touched off the cotton, which, as might be expected, flashed up in one tremendous blaze of light.

It is reported that on the same day (the 19th) the Executive Committee of the American Lantern Slide Interchange met at the Rooms of the New York Society, and examined several hundred slides contributed to the Interchange by the various clubs. The average quality of work sent is said to be much better than that contributed during the previous year.

The first Smoking Concert during this season was given at the Society Rooms on Thursday evening, October 18th, being more largely attended than any previously given. Members of the Mesurga Club rendered several pieces of vocal music satisfactorily. Mr. Stebbins, jun., succeeded admirably in instrumental music on the piano, while Mr. Frisbie entertained the members with a few sleight-of-hand tricks. There was also a short lantern exhibition of a few slides, under the direction of Mr. Charles Simpson. Altogether the affair was quite successful, and strengthened the social element it is the aim of some of the officers to encourage.

An interesting lantern exhibition, representing the work of members of the Society, was held on Friday evening, October 26th. Many of the new pictures were quite attractive and artistic. Among them were some excellent interiors, by Miss Catherine W. Barnes; capital figure and animal studies, by Mr. Charles Simpson; Marine pictures, by Dr. Nagle; beautiful landscapes, by Mr. H. J. Newton, Mr. Frank F. Cobb, and F. C. Beach; and novel and instantaneous studies by Mr. William Murray. The work

displayed through the medium of the slides indicated marked progress on the part of many new members.

It is the expectation of the Lantern Slide Committee to show new work by members at the monthly lantern exhibitions, which will probably prove more interesting than heretofore, inasmuch as great care is exercised in the selection and choice of slides.

About the 1st of December, an informal exhibition of photographs is to be held for a week or more at the Society Rooms, intended to represent the work of members. It will be inaugurated by a lantern exhibition on November 30th, and Mr. Edward Leaming is designated as the manager. No doubt it will prove an interesting event, since the Society has had no special exhibition of its own work for about three years.

A Chemical Committee has been organized under the able leadership of Mr. J. H. Stebbins, jun., and it is expected the Society will hear from it, from time to time, in the shape of exhaustive and interesting reports on subjects of immediate interest.

SULPHITE.

N.Y., October 27th, 1888.

### THE EFFECT OF ELECTRICITY ON A BROMIDE PLATE.

BY FRIESE GREENE.\*

THIS being the first paper given before this Society, I should like to mention here, before I proceed with my paper, how pleased I am to see how successful this Society has developed into existence. In fact, there has been no Photographic Society to my recollection started under such favourable conditions, having been with the first meeting of a few other Societies which I am happy to say are still in existence and doing well. But when I compare the number here, and the number at their third meeting, when you could count all in five seconds, the difference is immense, as here I defy anyone to count the number in five or twenty seconds, unless he took a photograph and counted the number on the quiet.

You must all remember, the first start requires more force than the second, for it is like a wheel which requires more energy to give it the first turn. In fact, the initial power of anything is the most important; that is the fundamental law of most things, which is not noticed as much as it ought to be. Now that the first wheel of this Society is on the move, we must look after it and oil it occasionally, and apply a little effluvia (which is the mainspring of existence) to make this Society success. The prospect of the Bath Photographic Society is very hopeful, and if we want advice, Mr. James Glaisher, the President of the Photographic Society of Great Britain, would only be too happy to help us, and as he is to photography like a beautiful stream from which we can always drink and be refreshed, we know where to run for sober thought and good advice. Then we have Mr. Fox Talbot, son of the father of photography, near us, and willing to help us, which we are, I am sure, proud of. I need not mention the chairman, and the others that are here to-night, for we all know them.

Now to my paper. You might say, Why does Mr. Greene not give us something more practical? Well, I'll state briefly why I bring this subject before you. I want this Society to know how far photography has advanced up to the present date, and to set some of you thinking, and give you plenty of photographic food to digest. If I sow the seeds of a few agitating mysteries that you feel you must solve, I have accomplished what I want.

This is an uneasy age, but you will find the most work is always done in those uneasy ages. When I say you can take a photograph with the human eye it seems marvellous, but I have done it, and shown the results before the British Association; these Mr. Glasbroke, of Trinity College, Cambridge, has kept.

Now, I am going to tell you something that has never been mentioned before: I am going to tell you I can photograph the voice. I was only sure of it last week, so I could not notify it in my paper; but I'll show you how it is done, that you may be able to do it yourselves—it is so simple. You get a piece of parchment and stretch it like a drum, then stick on the centre a very thin piece of silver-polished glass. Now have a ray of light coming through a pinhole, with a piece of talc coloured

\* Read before the Bath Photographic Society.



green in front of it. Let the ray of light fall upon the polished silver glass, then the reflected ray upon a sensitive plate, which is gradually kept moving at a distance of three feet from the silver-polished glass. Now speak to the drum behind the silver-polished glass, and the vibrations of the parchment diaphragm caused by talking to it will be recorded on the sensitive plate after developing. Different voices will give different vibrations. So now you can see photographing the voice is not such a mystery as we might imagine. I have not mentioned this to anyone, because I thought this Society should be the first to hear of it.

Now for the first experiment. Down upon my paper is, the effect of electricity on a bromide plate in different solutions, and in a vacuum. The first thing I do is to put a bromide plate (any bromide plate will do for this experiment) into a weak solution of hydrochloric acid (2 drams to 10 ounces of water). Now put a piece of silver (I'll use a shilling, as you will all be able to recognize the impression, I expect) on the film. Then take the positive wire of a battery, to which is attached a piece of platinum, and put it in the solution. Now take the negative wire and touch the silver with it. Leave it there for a few seconds; take the plate out and develop, and there you will see the impression of the piece of silver with which you are acquainted. Now you can get a similar effect with either copper or gold instead of silver, and instead of hydrochloric acid use ammonia, or even water.

Now I am not going to advance another theory of the latent image, but maintain that those we have been taught are wrong. One of the principal theories is this. Light acting on a silver salt threw the component atoms of each molecule into a state of vibration; the developer separated the metal from the haloid.

What I want to impress upon this young Society is, don't be led away by books. Photography is not very old—there is not one-millionth part found out of what it is going to do—so let each one who intends to experiment rest upon his own experiments and individuality. Never mind failures; it is by the seeking and fumbling we learn the truth. So now don't let anyone sit down and think there is nothing to do in photography.

### THE INFLUENCE OF SUNLIGHT ON TREES

In the report of the head of the Forestry Department of the United States, reference is made to the effect of light on the growth of various trees. It is well known, says Professor Fernow, that light is necessary for the development of chlorophyll, and, therefore, for the life of all green plants, and especially for that of trees. The heat alone which accompanies the light is not sufficient, although the relative influence of the light and the heat on the growth is still an open question, as well as the relative requirements in light of different species of trees. In the case of forest weeds—which, in forestry, serve as an indication of the amount of shade which the trees exert, and with that their capacity of impeding evaporation—some require full sunlight for their development; others are averse to a high degree of light. To this must be due the change in the plants of a district when its forests are removed. Then the amount of light or shade needed is modified by site. Where the sunlight is strong, in higher altitudes, drier climates, or where the growing season is longer, or there are more sunny days, some species will endure more shade. The flora of high altitudes in general requires light. Trees nearly always develop best—in other words, make most wood—in the full enjoyment of light; but their capacity of developing under shade varies greatly. The yew will thrive in the densest shade, while a few years over-topping kills the larch. The beech will grow with considerable energy under partial shade, where the oak would only just keep alive, and the birch would die. When planted in moist places, all species are less sensitive to the withdrawal of light. In the open, maples, elms, sycamores, and others grow well, and make good shade-trees; in a dense forest they thin out, and have but scanty foliage. Conifers, such as spruces and firs, which preserve the foliage of several years, have perhaps the greatest capacity of growing under shade and preserving their foliage, in spite of the withdrawal of light. In America, sufficient data to group the forest trees according to the amount of light required by them have not been collected; but rules based on experience have long been formed in Germany, where the behaviour of trees under different conditions of light has been carefully studied. It has been found, for instance, that on the same branch those

leaves which are developed under the full influence of sunlight are not only larger and often tougher in texture, and thicker, but that they have a larger number of stomata or breathing pores than those less exposed to light. The whole subject is one of the utmost importance in forestry, and observations and experiments are to be carried out in regard to it in the United States.

### EXPOSURE AND DEVELOPMENT.

BY JOHN MATTHEWSON.\*

THE short paper which I am to submit to you to-night is not intended to be other than a summary of my own experiences in regard to the exposure and development of gelatine dry plates, and though much that I shall say may be familiar to the older hands present, I hope there will be found some information which will be of service to those of more limited experience.

As very few of us have the time to devote to making our own plates, a few words in reference to the kind of plate we adopt may not be out of place. It is most important to choose a good brand of plates, for without that it is hopeless to produce regular good results. Economy in price ought not to be a consideration, for, counting by results, the cheap plates are very often the dearest in the end; there will be a much larger percentage of failures in using them, besides loss of time and temper.

We should choose plates which are thickly and evenly coated. In order to have a good gradation of tone in our negatives we must have a substantial thickness of film; thinly-coated plates must be avoided on that account, and for the reason that they are more liable to fog during development. Every brand of plates must be carefully studied, both with regard to their exposure and development, until we become thoroughly expert in their use.

We ought always to work with at least two makes of different rapidity; one for short exposures or shutter work, and the other much slower, say about half or a third the speed, for our ordinary work. A very rapid plate should not be used for a subject to which we are able to give a long exposure. It is a very common error with many to give a preference to quick plates for all kinds of work; if they would only consider a little, they would find many reasons for discontinuing them, unless under special circumstances or for certain subjects. It is much more difficult to approximate the exposure of a very rapid plate, and they are more difficult to develop. The extremes of under and over-exposure are more marked on a picture taken with a rapid plate, and they are more liable to be spoiled by light reaching them through the dark slide.

After adopting, say, two brands of plates, one for rapid exposures and the other for ordinary work, we must get some general idea as to their speed with the lens we use and the method of development we employ, for the speed of our plate is governed to a certain extent by our method and formula of development.

Too much can hardly be said on the subjects of exposure and development, for on them depends, to a great extent, the production of successful photographs. There are so many factors which regulate the duration of exposure that it is quite impossible to formulate any definite rules regarding it. We must be guided by our own experience. The most important of these factors are the quality of the light, the character of our subject, the speed of the lens, and the plates we use. The two latter, of course, we can approximate with little difficulty.

It is not so easy to estimate the character of the light, for not only have we to value its actinic power, but we have also to take into account the relation between direct and reflected light, and it varies so much that we can only estimate it at the moment of exposure.

In landscape work our high-lights are, of course, illuminated by direct light, and our shadows by reflected; and it is mainly from a comparison of the depth of our shadows with the high-lights of our subject that we must decide our exposure. The greatest reflectors we have are the clouds, and the whiter they are the better reflected light we shall have, and the better will our shadows be illuminated. If our light be what is termed hard—that is to say, where we have a blazing sun and no clouds—then our reflected light is very poor, our shadows very dark, and high-lights very brightly illuminated. In this case we must give a sufficiently long exposure to bring lights and shadows into proper harmony. If our light is soft—that is to say, where the

\* A Communication to the Dundee and East of Scotland Photographic Association.



direct rays of the sun are obscured we have to be doubly careful—of the duration of our exposure, as our shadows and half-tones will be of a very delicate nature, and on that account we shall be more liable to over-expose the picture. Again, we must consider the character of our subject: its prevailing colour, its extremes of colour, its distance from the lens, the relations of foreground to background, and their respective importance in the picture, are all elements which require study in each individual case.

While these are the most important points which we require to consider, there may be others which we may have to take into account; but the value of these can only be estimated at the time of exposure. We must, therefore, bear in mind that these elements are so dependent on each other that it is quite impossible to lay down any fixed rules which will apply in every case. The craving for a certain method of exposure has led to the introduction of actinometers and tables of exposure, which are said to be absolutely effective in giving the correct exposure for any subject. The opinion of most authorities is that these are worthless, unless in very exceptional circumstances. The actinometer cannot give you the depth of your shadows, or the relation of shadows to high-lights, and although much valuable information may be had from the tables as to the relative exposure of different subjects, they cannot be relied upon in every case, and they accustom one to trust to a table for information which can only be obtained by observation and experience. So much with regard to exposure; and now a few words on the subject of development.

While we ought all to learn to approximate as closely as possible a correct exposure, I think many amateurs are too anxious to be absolutely correct in this respect, developing their plates in a mechanical fashion. They entirely fail to appreciate the extent to which proper development can modify a faulty exposure. To learn to develop well is the most important operation in photographic work; for if by careless or improper developing we fail to form good negatives, no amount of experience or care in printing will produce first-class pictures.

Capt. Abney, one of our greatest authorities, has said that the development of a gelatine plate is in reality an art and science combined; the art consisting in getting the proper gradation, and the science in mixing the solutions to obtain it. If it were possible always to give the correct exposure, there would be no trouble in development. It would then be a mere mechanical operation; but, as we cannot have this, we have to find some method of correcting the effects of a wrong exposure. This we have in the operation of development. To begin with, it is most important that we bear in mind the effects produced by over and under-exposure, and also by slow and fast development. Note that over-exposure produces the same effect as fast development—namely, want of contrast between light and shade—and under-exposure the same as slow development—namely, great contrast between light and shade.

Under a rational method of development, we can allow ourselves a wide margin in our exposures, provided we err on the side of over-exposure. In order to have full control over our development, this operation must be carried on slowly, and this can only be done if our plate is fully exposed, for an under-exposed plate requires a quick development. Again, if we develop an over-exposed plate quickly, we cannot have any control over the operation, for the plate becomes ruined before we have time to modify our solution. For the development of a good negative, therefore, we must take into account the following factors: the character of the subject and of the light, the duration of the exposure, the strength of the developer, and the rapidity of development. These are all co-related; they have to be studied and modified to suit each other in every individual case.

The principal chemicals used in the process of development are ferrous-oxalate and pyrogallie acid, with an alkali; but quite recently two substances have been recommended to take the place of the pyrogallie acid, namely, hydroquinone and hydroxylamine, but these are as yet little known and seldom used, although the former is supposed by many to be the developer of the future.

Almost all photographers have their own pet formula for development. This is natural and right, for the more they practise one method, the more proficient they become in its use. If our exposures could be more closely approximated, I consider that the ferrous-oxalate would be the preferable developer, for with it we get a brighter, crisper negative, with a better gradation of tone than with any other, but the necessity for an abso-

lutely correct exposure is an insuperable objection to its adoption.

Beach's developer, and all the other soda developers, are open (though not quite to the same extent) to the same objection, and, over and above that, on account of the caustic nature of the soda, they tend to frilling during development, and do not produce negatives equal to the pyro and ammonia for gradation of tone.

The pyro and ammonia developer, on the other hand, if used intelligently, gives us first-class negatives, second only to those developed by ferrous-oxalate, with the additional advantage of an enormous power of correction of faulty exposure and bad lighting. To quote one of our best authorities on the subject: "The great point is to keep constantly in mind the respective functions of the different constituents of the developer, and learn the effects produced by modifying their relative proportions. Increase of pyrogallie acid produces increased density or contrast between light and shade. Increase of ammonia produces more rapid development and increase of detail. Increase of bromide produces slower development and greater contrasts between light and shade." By bearing these in mind, and by adopting a system of full exposures and slow development, you can easily see what a power is placed in the hands of the careful and patient operator for the production of regular good results.

Our first object in developing must be to find out whether our plate is under or over-exposed, and to do this we must commence with a solution of the normal strength of pyro and bromide, and a small percentage of ammonia. As soon as the image begins to appear experience will enable us to judge how we are then to proceed. If the plate is slightly under-exposed, we must largely increase our ammonia and dilute the pyro solution; if very much under-exposed, we shall save both time and trouble by throwing it amongst our waste glass, for no amount of doctoring will produce a good result from a very much under-exposed plate. If we find it only slightly over-exposed, we may, by a very slow development, produce a good negative with the solution applied at first. If much over-exposed, we have various ways of proceeding; we may increase our bromide, reduce our ammonia, or increase our pyro, or we may do all three according to the amount of over-exposure the plate has received.

By adopting this method of development, with a little experience, and bearing always in mind the effects produced by the different chemicals we use, and their respective proportions, we are able to produce good results from plates which have received even five or six times the correct exposure.

Closely allied to the subject of development are the operations of intensification and reduction. These are of some importance to the modern dry-plate worker, on account of the difficulty of appreciating the density of the negative in the process of development and before fixation. I have tried many formulae for both operations, and have come to the conclusion that it is better to so develop as to err on the side of over-density; for the reason that it is easier and more effectual to reduce density than to intensify. No formula of intensification has as yet been brought out which is entirely satisfactory in its results. In order to prove what I have said in regard to this method of development, I have here five negatives.

## Notes.

Every photographer who has regard to his own reputation should carefully study Foxlee's paper on "Testing Photographic Mounts," which paper is to be found on page 796. The paper in question was read at the Photographic Club, and a number of interesting specimens were shown as illustrations.

It is stated, says the *Star*, that a gentleman who has been employed to enlarge, for magic lantern purposes, the alleged Parnell letters in the *Times*, has discovered that the pen stopped at least twenty times in forming the characters. In the case of the genuine letters the pen



travelled up and down without stopping. If this be so, what could be better than to have the letter photographed, and an enlargement made so that the Court could see for itself the difference between the known real handwriting, and that which is alleged by the *Times* to be real.

The fierce light which beats around the throne penetrates the photographic studio. In the feverish brains of foreign politicians photographs have sometimes a political significance. Thus, French journalists have discovered that a marriage has been arranged between the Prince of Naples, heir to the Italian throne, and Princess Margaret of Prussia, not because they have seen a photograph in which the young couple are represented together, but because when the Emperor William was in Rome he was photographed with the King and Queen of Italy and the Prince of Naples, and the picture represents the Prince of Naples leaning affectionately on the Emperor's arm. To discover so much in a harmless photograph of this kind argues the possession of powers of foresight of which our journalists are fortunately deficient.

Everybody, however much he or she may deny it, has a lurking desire for immortality so far as the painter's brush can convey it. Quite a flutter runs through the Court where the Parnell Commission is sitting when Mr. Philip Calderon, who is painting a picture of the scene, lifts his pencil and casts his eyes around. The difficulty he finds is that people are so alive to his presence, that not only do those he wants to get appear self-conscious and unnatural in expression, but those he does not care about are perpetually thrusting themselves into prominence; in addition, he has received requests from all sorts of unknown persons, hoping that he will not forget to put in their portraits, and in some cases the requests, we are told, have been accompanied by photographs.

This kind of thing is not at all a novel experience to the landscape photographer. He is perpetually annoyed by people anxious to pose, and who either cannot or will not understand that their presence is not needed in the picture. If the photograph to be taken is in a town, say of a church or public building, it is a hundred to one but what a butcher boy with his basket will put himself in a line with the camera, and will not budge by any amount of persuasion. We do not know why the butcher boy haunts the photographer, but such is the case, and the only way to outwit him is either to go through the form of photographing save the exposure, or point the camera in quite the opposite direction, wheeling it round when he has disappeared, proud of having been taken, as he supposes.

Photographs have figured so much of late as evidence in divorce cases, that a statement made by Mr. Justice Butt last Saturday comes as a kind of shock. Whether Mr. Justice Butt has himself been lately photographed, and has discovered he is not a bit like what he thought himself to be, or whether he has been "touched" out of recognition by his friends, we cannot say; but certainly he must

have some strong reason for announcing, in a case where the evidence of identification rested upon photographs, that the Court never relied upon the latter. So says one report. Another makes Mr. Justice Butt say that he did not rely "solely" upon photographs for identification. It is to be hoped, for the credit of photography, that the latter version is the correct one.

The latest addition to the ranks of photographic societies is the one just inaugurated at the Brassey Institute, Hastings. It will be termed the Hastings and St. Leonards Photographic Society, and will admit both amateurs and professionals. A feature worthy of imitation is that it welcomes lady as well as gentlemen members. The president is Wilson Noble, M.P.; we note that the latter, in his inaugural address, is reported to have said, speaking of amateurs, that "when they considered that the body of amateurs included the name of Captain Abney, who invented the platinotype process, and the names of others he might mention, it showed that amateurs had taken steps to advance the science of photography." Quite so; but we fancy that Captain Abney, who has invented many things, does not lay claim to be the inventor of platinotype.

The *International Journal of Surgery and Antiseptics* (New York) warmly advocates the use of photography in the study of disease, especially in regard to vertebral and joint diseases. The attitudes of a person so afflicted are very characteristic, and in some cases of spinal complaint, months before there is any angular deformity the attitude of the patient indicates not only the existence of the disease, but the particular locality in the spine which is so affected. The *International Journal* recommends the surgeon to photograph the patient when standing, and also in the sitting or recumbent posture as well. The writer, speaking of the readiness of the well-trained horseman in detecting "lesions" in the horse, says, "Would that the significance of certain limps of human beings, examples of which we are accustomed to see almost daily, were as generally known among physicians as are the limps of horses among horsemen." If this be so, to make the series of photographs complete, the patient should be photographed in the act of walking, as well as when standing or sitting down.

#### PRINTING-OUT PLATINOTYPE, AND A COMPARISON OF PLATINOTYPE PROCESSES.

BY F. DE PAULA CEMBRANO.\*

UNTIL quite recently we knew but one method of printing with platinum. In this process, which is well known to most of us, a suitably-sized paper is sensitized with a solution made with chloro-platinate of potassium and ferric oxalate, to which a small trace of chlorate of potassium or chloride of mercury is sometimes added.

On exposure to light, the ferric salt is converted into the ferrous salt; this is the change that visibly takes place in the printing-frame. When, after sufficient exposure to light, this salt is dissolved in a suitable solvent, it reduces the platinum to the metallic state. Metallic platinum is a very stable substance, which resists the action of all acids, and does not alter under the influence of the atmosphere.

The solvent, or developer, most used is one consisting of a hot solution of oxalate of potassium.

\* Paper read at the Camera Club.



After passing by this bath, the print is immersed in acidulated water in order to remove all the remaining traces of iron. Once the acid bath is colourless, a few changes in clean water complete the operation.

This process, now called the "hot-bath process," was invented by Mr. W. Willis, and I, for my part, am grateful to him for his discovery, for to my taste it is the process, *par excellence*, and in fact, the only one I work.

Lately, we had the pleasure to see this same gentleman bring before us a variation of this process, in which the hot developer is discarded. This process is known as the "cold bath process." The paper is prepared with the iron salt alone, the platinum being added to the developer, which is used cold.

In this method of printing my experience is, so far, a very limited one, but what I have done shows me that it is equal, if not superior, to Mr. Willis's first invention. It has, perhaps, less softness, but it gives very brilliant prints, with very vigorous blacks. I should say that it is especially useful for the reproduction of engravings and similar kinds of print, where a powerful black is required.

For the amateur who wants only a few prints at a time, it has a drawback; for, if the developing solution, which is rich in platinum, is not promptly used, the precious salt becomes so much waste.

It is claimed that this process gives greater latitude in exposure, and though I have seen this fact clearly shown in Mr. Willis's lecture in this Club, I must confess that such has not been the case in my hands. I found that the image came out almost as quickly as when using the hot-bath process, and, consequently, I had greater difficulty in controlling development. The image flashed out as soon as the liquid had touched it. On this I tried diluting the developer both with the oxalate and with plain water, but the results were not satisfactory.

The above two processes, although so near perfection, have the drawback that, while printing, the progress of the image is only visible to a certain degree. The picture, when sufficiently printed and taken out of the frame, is but a weak shadow of the vigorous image that the developer will bring out. This has, to a great extent, deterred many amateurs from adopting this charming process, for they find a difficulty in judging the exposure. Workers who daily print in platinotype will, of course, tell you that the process is as easy as silver printing; but many of us lack that constant practice, and consequently spoil much paper, and often, in despair, give up the process altogether. We must, therefore, acknowledge that Captain Pizzighelli has rendered us a good service with the introduction of a third method, in which the image becomes fully visible whilst printing, and its progress can be followed just the same as with ordinary sensitised silver paper.

The developing operation is no longer necessary, as, once the picture is sufficiently printed, all that remains to be done is to fix it in weak hydrochloric acid (1 of hydrochloric acid to 60 of water), and then wash it in a few changes of water.

Pizzighelli discovered that if one of the substances which is used as a developer be added to the sensitising solution, the platinum is reduced when exposed to light, under the influence of the moisture in the air.

The possibility of being able to print right out in platinotype at once fascinated me. It was not till later on that I was able to start the series of experiments, the outcome of which I have the pleasure to bring before you to-night.

Though very hopeful when I first commenced, I confess that inwardly I very much doubted that the same beautiful results could be obtained by the new process. After a little reflection, I concluded that the most practical way of trying the newcomer would be by printing from a variety of negatives. I accordingly selected eight negatives from among my small stock. You will see that there is a fair range of density and a variety of subjects. Some are a little flat, others brilliant; some are thin, while others are strong and vigorous. In the one with a cart and a horse you will find a good example of an under-exposed and hard negative with very weak details in the deep shadows. If you look now at this negative you will see a large doorway represented by almost clear glass, and here I must remark that it is in such very deep shadows that the printing-out process has been most troublesome to me, and it is especially in this respect where the other two processes showed at first their superiority in a marked degree.

After obtaining as good a print as I possibly could from each of these negatives by the two first processes, I then tried some of the commercial platina-paper. In the series of prints which

I shall presently exhibit you will see the results I got with it; and I only have to add that the manufacturer's agent formally informed me that the sheets I had purchased from him were all out of one batch.

My further experiments were made on paper prepared by myself, following at first Pizzighelli's formula very closely, and then making the alterations and additions that I thought would lead to the desired result.

Pizzighelli gives out three ways of working this process—one in which the paper has to be sized previous to sensitising; a second one where the developing substance is added to the sizing liquid; and the third method, in which the sizing and sensitising are done simultaneously, thus saving one operation.

Although I strongly recommend the use of a well-sized paper from the first, I will here briefly sketch the above three methods. In the first instance, the paper is coated twice with a 2 per cent. solution of arrowroot. From 4 to 5 drs. is about the right amount of a sheet 26 by 20 in.

For coating, either a bristle brush, a sponge, or a tuft of cotton-wool are suitable; but, personally, I much prefer using the latter, as it is easier and better to manipulate, and can be renewed for each operation.

The sensitising is not difficult, but to begin with it will be advisable to try small sheets. The plan I adopt is the following one:—Once the solution is well and evenly spread over the paper, hang it by two corners till the surface moisture has disappeared. [Mr. Cembrano here sensitised a sheet of paper before the meeting.] It has been my custom, when arriving at this stage, to dry the sheet in front of an ordinary gas-stove, taking care not to scorch the surface of the paper; but by what I have experienced since then I think that drying before a fire can altogether be dispensed with, it being sufficient to hang the paper for some hours in the dark.

In most of my experiments, when I first began, I was greatly worried, sometimes with poor flat prints, and a mottled and sunken-in appearance; at other times I found it quite impossible to prevent a sort of reversal in the deepest shadows of the image. These, instead of going black, turned to a peculiar dark-brown colour. To remedy this I tried varying the proportions of the different solutions, and then modified my method of sensitising, but all to no avail. Ultimately I concluded that the fault was due to a too-dry condition of the paper. I may here remark that I had been in the habit of storing the sensitised paper as soon as dry in the ordinary calcium tube.

Here are two series of prints—20 and 20A—prepared and sensitised exactly alike, and printed from the same negatives. In one case—those marked 20—I could not get a good, or even a passable black in the deep shadows, no matter how I prolonged the exposure or how I treated the prints after these were taken out of the printing-frame. This paper had been kept all night in a calcium tube, and was bone-dry when put into the printing frame. In the second case—those marked 20A—the only difference in the treatment was that, instead of storing the paper in the tube, I left it all night in a cupboard, simply rolled up in paper, and then, before printing, I left the paper exposed to the atmosphere for one hour. You will doubtless notice the immense difference between these two series.

This leads me to the subject of damping the paper. Some say "Steam it" before printing; others prefer to put a damp-pad in the printing-frame, behind the paper; while somebody else recommends to treat the print in various ways after printing, such as breathing on it, or leaving it for a short time in a damp atmosphere, or passing through a weak and cold bath of oxalate, or even immersing in plain water previous to fixing. Well, I have tried all these recommendations, and got quite bewildered at the results. Sometimes I observed the desired effect, whilst at others I could get no change whatever, and, what is still more puzzling, I found that under certain conditions the image lost in strength after damping—I am talking now of damping after printing and before fixing. After repeated trials I came to the conclusion that if the paper is perfectly dry before printing, such practices as breathing, damping, &c., will produce an increase of intensity, and bring out details in the high lights which were not visible before. Coupled with this there is also a kind of continuing action. (See some examples. Nos. 16 and 18.) In this instance (those on No. 18) these series were only half printed when night came, so that I was obliged to postpone printing till next day. I left them all night in the frames in a dry-room. You now see how I found them on the following morning.

But if the paper has not been kept so very dry before it is put in the frame, damping or breathing will have little or no effect.



Let us now pass on to the preparation of the sensitizer. The various formulæ have already been published several times, so that I shall limit myself to giving you the proportions used in some of the experiments now before you.

Starting with Pizzighelli's first method:—After the paper was properly sized, it was coated as follows:—

A solution of chloroplatinite of potassium was made in the proportion of 1 to 8, and we will call this A solution.

B solution was made with sodium ferric oxalate 4 drachms, dissolved in 3 per cent. solution of sodium oxalate 10 drachms, and glycerine 15 minims.

C { Solution B=5 drachms.  
5 per cent. chlorate potassium, 25 minims.

For one sheet 26 by 20 { A=100 minims.  
C=140 „

In the next trial (No. 14) I substituted oxalate of potassium for the oxalate of soda, but the results were not so good, the image being rather flat, and perhaps granular. It seemed, however, to print somewhat quicker.

Not having sufficient time to try this experiment again, I went on to the second method. Here, I added the developer to the size, by dissolving the arrowroot in the 3 per cent. solution of sodium oxalate in the proportion of 2 to 100. After this sizing, and when dry, sensitise the same as above, dissolving the green crystals in distilled water instead of in the oxalate solution.

By the way, it is very strange that the streaky marks due to uneven coating show very pronouncedly whenever the paper is used too dry, or when the continuing action is resorted to.

Regarding the method just spoken of, the notes I made at the time say: "Very slow printer; irregular in tone, and patchy." This may be greatly due to bad coating, or to using too fresh a paper.

Nearly all, if not all the prints that I am showing to-night, were made on the paper used by the Platinotype Company for their processes. In some cases I sensitized on the sized side, in others I used the obverse side. When using this paper, which is already strongly sized, the gum may be dispensed with, and this is an advantage, as it is far easier to coat when the liquid is thin.

(To be continued.)

## ON THE PRINTING DENSITY OF NEGATIVES.

BY LYONEL CLARK.\*

A FULLER title than above will, perhaps, better explain the scope and intention of the present paper. The point I especially wish to raise discussion on is the particular quality of negative, as far as regards the thickness and gradation of deposit, that will best suit the different printing methods most in vogue.

We, of course, all know that a considerable latitude in the character of the negative can be compensated for by skill in the manipulation of the chosen positive process; but it is not in my province to-night to go into that. I merely wish to ascertain the particular average quality of negative that will give the best print on any desired positive process, this latter being worked strictly in accordance with instructions—mechanically, so to speak.

Let us consider what a negative really is. When light, followed by a developer, acts on the sensitive film, we know the film is darkened; if the light be stronger, or the time of exposure longer, the darkening of the film will be greater, and, within certain limits, the longer the exposure the darker the resulting deposit. So that, given a correctly-exposed negative of a well-lighted scene—that is, one giving a good gamut of tones between the darkest shadows and the highest lights—the negative of this scene will under development go on darkening proportionately up to a maximum point, that point being limited by the nature of the film. Now, I may say that even on the thinnest and most starved plate, with a sufficient exposure, this maximum amount of darkening will be too great for almost any printing process.

I know that it is a common complaint that it is with any plates almost impossible to obtain density; but this is really due to under-exposure—the light has not had time to do its full work; at the same time it is, of course, possible to get a thin image through over-exposure; that is to say, the high-lights may have suffered partial reversal, a well-known concomitant of over-

exposure. But, as a rule, thinness will be found to result from under-exposure.

It is a common thing to say, looking at a thin negative, that it is over-exposed; and looking at a hard black-and-white negative, that it is under-exposed. But this is only correct in part. In the over-exposed negative we could have got any reasonable amount of density, but unfortunately it would have been nearly equally dense all over; for in all such negatives the deepest shadows will probably have received a sufficient exposure for them to blacken up to the full density of the high-lights, which may even be reversed, or partially so, and consequently, on development, fix out thinner than the half-tones, and the picture would tend to print out wrong way about. We practically know that by continuing the exposure long enough we can reverse the whole image, and obtain a positive from a positive or a negative from a negative.

On the other hand, a hard black-and-white negative is not really black because it was under-exposed; on the contrary, those parts which have developed black were at least fully exposed, or they would not have blackened to that extent. What has really happened is that we have allowed, whilst waiting for the under-exposed shadows to come up, the higher lights to obtain too great density, and the resulting negative is too dense or hard. But even in the case of a correctly exposed negative it is possible to get a very great variation in density. We have seen that the density depends on the thickness of the deposit left in the gelatine film after fixation. Now, if we imagine the molecules of which the deposit is made up to be bricks, we can say that in the thinnest part it is one brick thick, in the half-tones ten, and in high-lights twenty bricks thick, and so on; and we can lay out a diagram in which the number of bricks will denote the thickness of the deposit, and if we build up the number of bricks corresponding to a certain time of exposure or intensity of light, which is the same thing nearly, on a line representing that exposure, we can draw out a curve giving us the value or thickness of deposit due to any particular exposure.

The curve I show you is taken from a sensitometer plate, prepared by Captain Abney, made after Mr. Spurge's method. Here the vertical lines represent equal increments or periods of exposure or light intensity, and the vertical line shows the amount of density that the plate received from that exposure.

Now, let us expose a piece of sensitive paper behind such a sensitometer, and watch its behaviour. The paper under the thinnest square will commence to darken at once, that under the next dense will then commence to show signs of exposure, and so on, square after square. Now, after a certain time the paper under the thinnest square will have obtained a maximum blackness, beyond which it is not capable of going; the only effect after longer exposure will be to bring the portion under the next square up to an equal blackness.

On examining the paper under the rest of the squares, we shall find one square under which the paper remains uncoloured, the opacity of the sensitometer at this point having been sufficient to stop all light action.

We could, of course, by a longer exposure get this square and the next, and, indeed, every square, to print out, but what would be the result? At the opposite end of our sensitometer the paper under all the lower squares would have darkened up to a uniform blackness. This is certainly not a desirable effect, for if our sensitometer were a negative of a picture, it would mean that all the detail in our shadows would have been brought up to our density, and so destroyed. Therefore, as soon as the clearest part of our sensitometer screen—equivalent, of course, in our negative to the deepest shadows—has let enough light through to darken our print to the utmost blackness required, we should at once stop the exposure. I am, of course, imagining that the process used will not lose any of its intensity or blackness by after treatment.

Now, on examining this print, we have a clue at once to the density that our negative should have—in fact, more than a clue, an absolute and infallible guide. For it is very evident that if any portion of our negative is denser than the particular square which, in the above experiment, left the paper under it uncoloured, or nearly so, we shall not get it to print out at all, unless we allow the bottom squares to become over-printed and uniformly black. On the other hand, if we stop our printing when the first square—that is, the thinnest one—gives us maximum blackness, the details in the high-lights will not be represented on the print, but show large patches of white.

We are therefore fixed between these two points, and all prints from a negative which has a greater range of gradation—

\* Paper read at the Camera Club.



or, what is the same thing, a deposit denser than the critical square of our sensitometer screen, which we saw limited the darkening of our sensitive medium—will be useless for the particular positive process we are using.

Some sorts of paper may show a wide range; that is, they will show many intervening squares between blackness and whiteness, and the curve if plotted out will be long and flat, whilst other papers may show but little gradation between the two extremes, and their curve will be short and sharp. Of the former kind we should at once say that it requires a denser negative—that is, one having a long gamut of degradations, from clear glass to a most opaque deposit—to get the best results. Of the latter we should say that it requires a thin, delicate negative, with but slight gradations between the shadows and the high-lights. If we know the light-resisting power of each separate square of our sensitometer, we can, by exposing under it the particular positive process we wish to examine, and noting the difference between the squares corresponding to white and black on the print, mathematically express the maximum density and range of deposit that our negative should have to suit the process under examination.

I propose to examine with a sensitometer the particular density of deposit that will best suit the following printing processes:—

#### IN PRINTING-OUT PAPERS.

1. Ordinary albumenised.
2. Plain salted paper.
3. Obernetter sil.-chloride.
4. Platinotype, developed hot.
5. Platinotype, developed cold.
6. Willis type, X or brilliant paper.
7. Willis type, Y or soft paper.
8. Pizzotype.

#### OF DEVELOPABLE PAPERS.

9. Ilford rapid bromide
10. Ilford slow bromide.
11. Ilford alpha bromide.
12. Fry's argentotype.
13. Eastman bromide.

And I propose to try and determine the particular kind of negative that will best suit each of the above printing processes, working these processes strictly according to their instructions, and using an average light. I mean by that, for printing-out processes, an average diffused light, and not sunlight, and as regards developable papers an ordinary gaslight, not lime or magnesium; for the value of the light has a very important bearing on the nature of the curve of intensity—indeed, this phenomenon is well worth much more serious investigation than the scope of this lecture allows. Practically it is known and admitted, for every beginner's book tells you to print a dense negative—that is, one with a slow intensity curve in the sun—whereas a weak negative—that is, one with a rapid curve—is to be printed in very weak light.

Although not generally so admitted, this is equally true of negatives, and the effect on a dry plate of a short exposure with a large stop is not the same as the effect of a long exposure with a small stop. Although the light be constant the product of the "light intensity by exposure" is certainly the same, but not the effect as regards reduction of the silver salt. I mean thereby that an exposure of 1" with a  $\frac{1}{4}$ th stop is not equivalent to an exposure of 64" with a 1-64 stop, although, by calculation, the product of the two will be the same.

The action of a fogged negative on printing-paper is a similar phenomenon. If it were not so, a fogged negative should print exactly the same as a clear one, only requiring a longer time, that is supposing the negative has proper gradations, for then the fog would only represent the addition of a light-resisting deposit over the whole negative equally. Even different samples of gelatine may affect the prints. Every one knows the good printing qualities of a collodion negative, for this vehicle is particularly clear in the dark shadows, whilst at the same time the deposit that corresponds to the high-lights is also more transparent.

These differences of foggy images, muddy gelatine, &c., are, I admit, more scientific than practical, and not likely to cause trouble; but still the differences undoubtedly do exist, and all who have had any experience must have remarked how often certain negatives will give better prints than others.

Coming again to our point, the proper sort of negative for each process. Is it to be a thin or a dense, hard or soft one?

I had, perhaps, better state here precisely my interpretation of the usual qualifications applied to negatives. Beginning at the bottom of the scale, I call a negative—thin, feeble, or weak—one which has no gradation between the lights and shades—in fact, an over-exposed, undeveloped plate. A flat negative would be the next stage, that is a fairly good negative, but not quite strong enough in the high-lights. We then get the good negative, usually qualified with the adjective, "bright," "sparkling," that is, one properly exposed and properly developed; going further on, a negative will be called, first "brilliant"—this generally signifies that density has been slightly overdone; then "hard," or "black-and-white," generally signifying a negative that has been under-exposed in portions and over-developed in others, commonly called an "under-exposed negative."

(To be continued.)

#### SALE OF A CAMERA STAND.

ON Wednesday, at the Westminster County Court, the case of *Leather, Sadler, and Holmes v. Vanderweyde* was heard before his Honour Judge Bayley. Mr. Stewart was counsel for the plaintiffs, who carry on business at Manchester as manufacturers of photographic apparatus. The claim was for £6 10s., for a camera stand supplied to the defendant, Mr. Vanderweyde, the well-known West End photographer. Mr. Vanderweyde said that in May last he saw an advertisement relating to a new camera stand which the plaintiff had patented, and being anxious to secure one, he communicated with their London agent, who called to see him on the matter. The purchase was then completed, although Mr. Vanderweyde had only seen a sketch of the apparatus. In due course it was delivered. But according to Mr. Vanderweyde's statement it was in a most dilapidated condition. The enamel in a number of places had been knocked off, leaving the metal bare, and the woodwork was in a very rough state. In fact, it bore the appearance of a second-hand article that had had a good deal of rough usage, and for this reason he declined to pay for it, and wrote to the agent, asking him to call, which, after considerable delay, he did; but when the defects were pointed out to him, he treated them with indifference, and suggested that they might have been done in transit. Mr. Vanderweyde then wrote to the plaintiffs, asking them to fetch the stand away again, or he should put it outside, as he would not have such an incomplete article in his studio. The plaintiffs, however, did not send for it, and it had been standing at his premises ever since. He had never attempted to use it to see whether it worked properly, as he was so annoyed at its being sent to him in such a condition; but it had been taken great care of, and was now in the same condition as when he received it.

Mr. Garret, the plaintiff's agent, said he took the order from Mr. Vanderweyde for the stand, and offered to show him a sample of it, but he said it did not matter. The only question was as to what coloured cloth should be used to hang round it when not in use. This was agreed upon, and was forwarded on in a day or two afterwards. He had called on Mr. Vanderweyde in reply to a letter received from him, and had examined the stand, but could see no fault with it except that the paint had been knocked off in a few places; otherwise it was perfect.

Mr. Vanderweyde, recalled, said he had written to plaintiffs threatening them that if they did not fetch the stand away, he should put it out on the roof, but on second consideration, thinking that plaintiffs might take action in the matter, he had taken the greatest care of it.

The Learned Judge said it appeared to him that Mr. Vanderweyde had agreed to purchase a new article, and that plaintiffs had sent him a secondhand one. The verdict must therefore be for defendant with costs; the stand to be handed over to plaintiffs.

#### ALLEGED BREACH OF AGREEMENT BY A PHOTO TRAVELLER.

IN the City of London Court, on Monday, Mr. Commissioner Kerr had before him the case of *Taylor v. Vernon*, which raised a question of interest to the photographic trade and one of importance to travellers. The proceedings were instituted by Messrs. A. and G. Taylor, the Photographers, of Queen Victoria Street, E.C., and elsewhere, to recover the return of the sum of £7 15s. 5d., paid to the defendant, Mr. Henry Vernon, who was



formerly in their employment as a traveller, but who is now carrying on business on his own account at Brighton.

The plaintiff's case was that in March of this year the defendant entered into an agreement with them, which was reduced to writing, by which he was to act as their traveller, and was to receive a salary of two guineas a week, as well as a commission of  $2\frac{1}{2}$  per cent. on all business above £1,000 a year. He was required also to give the whole of his time and attention to the plaintiff's business, which he seems to have done. It was further asserted that the number of orders the defendant should have obtained for photographs was 150; whereas the actual number sent in during the time he was with them was 56. They had paid the defendant his salary, which he was only entitled to on bringing in the prescribed number of orders. As he was short in that respect they sued for the same proportion of salary to be returned.

The defendant denied the accuracy of the plaintiff's version of the matter. It was not as they had related it. He entered into an agreement which the plaintiffs should have produced, but as they did not do so, he handed his copy to the learned Commissioner. He received £2 2s. a week for eight weeks, and, according to the agreement, should have taken in ten orders a week—that was an average of ten orders a week—the agreement being only binding on him on condition that the plaintiffs employed him for twelve months. He was only successful in bringing in twenty-four orders in two months, when they discharged him. Had he remained the year with them, he would have found the required number of orders. The time during which he worked for them was the worst part of the year for the photographic business, and now they wanted him to return the money. That was, he urged, absurd. He had also to look after fifty agents as well.

The plaintiffs were unable to produce the original agreement, they said.

The learned Commissioner observed that the defendant was entitled to a year's service.

A clerk in the employment of the plaintiffs swore that the copy produced by the defendant was not an accurate one of the agreement.

The learned Commissioner said he should non-suit the plaintiffs, and allow the defendant's costs.

The plaintiffs were accordingly non-suited, and the defendant was allowed thirty shillings costs.

## Patent Intelligence.

### Applications for Letters Patent.

- 15,454. SAMUEL DUNSEITH MCKELLEN and JOHN DUNSEITH MCKELLEN, 3, Chapmau Street, Hulme, Manchester, for "Improvements in Photographic Cameras."—October 27th, 1888.
- 15,569. ABRAHAM LEON CAHEN *dit* CANN, 53, Chancery Lane, London, for "Improvements in Changing-boxes for Photographic Plates."—October 29th, 1888.
- 15,723. WILLIAM CROOKE and JULIUS COSTER, 18, Frederick Street, Edinburgh, for "Improvements in Portable Head-rest used in Photography."—[Complete Specification.]—November 1st, 1888.
- 15,753. FREDERICK THOMAS BENNETT and ALFRED EDMOND AUGUSTUS WISS, 186, Fleet Street, London, E.C., for "An Improved Photographic Shutter."—November 1st, 1888.

### Specifications Published during the Week.

- 15,727. ERNEST HOWARD FARMER, Professor of Photography in the Polytechnic Institute, Regent Street, W., and HARRY KNEEBONE TOMPKINS, of 43, Museum Street, London, W.C., Chemical Expert, for "Improvements Relating to the Preparation and Use of Sensitizing Materials and Sensitive Surfaces for Photographic Purposes."—Dated 16th November, 1887.

Our invention consists in the use of albumen as a medium for emulsifying, instead of gelatine, collodion, gum, or other colloid used for this purpose in the ordinary processes, and the application of the said emulsion to the production of albumen prints and images by development or printing-out.

In the preparation of an ordinary gelatine emulsion for producing positives or negatives, a solution of gelatine is taken, and solutions of a haloid salt and of silver nitrate are added alternately to the gelatine, with the result that the precipitated silver haloid is formed in the presence of gelatine. Our invention consists in

the precipitation or production of silver salts by the emulsion process in the presence of pure albumen.

In carrying out our process, we take albumen and dissolve it in a soluble haloid salt; to this is then added a solution of a silver salt; or we dissolve the haloid and silver salt in separate portions of water, and then add them alternately to the albumen.

If the emulsion is intended for the production of paper for printing-out, the silver salt may be in excess; but if the paper is intended for development, the albumen must be in excess. The following are good proportions:—

White of egg...	...	...	...	18 ounces
Potassium bromide ...	...	...	...	128 grains

To which is added

Silver nitrate...	...	...	...	196 grains
Water (distilled)	...	...	...	20 ounces

But other proportions may be used. Sometimes we add a small quantity of ammonia or ammonium carbonate to the albumen before emulsifying.

Papers are coated with the emulsion and dried, the film being rendered insoluble by immersion in alcohol or by the addition of chrome alum to the emulsion before coating. The paper thus prepared is exposed to daylight under a negative until all the details are out, which will require from 15 seconds to 5 minutes according to the quality of the light. They are then developed by any of the developers used for positive papers. A very good developer is as follows:—

Pyrogallol ...	...	...	...	12 grains
Sodium sulphite ...	...	...	...	100 "
Ammonium carbonate ...	...	...	...	24 "
Potassium chloride ...	...	...	...	20 "
Water ...	...	...	...	20 ounces

If the paper is intended for printing-out it is sensitised upon a bath of 8–12% silver citrate or other organic salt of silver.

A good sensitising bath is as follows:—

Silver nitrate ..	...	...	...	48 grains
Citric acid ...	...	...	...	20 "
Ammonium nitrate ...	...	...	...	10 "
Water (distilled)	...	...	...	1 ounce

Or sometimes we precipitate silver citrate or other sparingly soluble salt of silver along with the silver haloid, and, by this means, prepare a paper suitable for printing-out at one operation. The precipitation is carried out as before. Sometimes we mix the finished emulsion, whether for development or printing out, with a solution of hard gelatine. In this case the chrome alum or coagulation by alcohol is not necessary. The emulsion may be used for coating opals or glass as well as paper, the film being rendered insoluble by immersion in alcohol.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

1. The application and employment of pure albumen as a medium in which to prepare photographic emulsions instead of gelatine, collodion, gum, or other colloid usually employed.

2. The application of the albumen emulsions obtained as described in the foregoing specification to the production of sensitive surfaces on paper, glass, or other material to be used for the production of photographic images, either by development or printing-out.

## Correspondence.

### BRILLIANCY OF IMAGES PRODUCED BY PHOTOGRAPHIC LENSES.

SIR,—I have carefully read Mr. W. K. Burton's article in your paper of just a fortnight ago. I was absent from town at the time it appeared.

I am as anxious as he is to make clear the theoretical considerations which led me to make the remarks upon the brilliancy of images produced in photographic lenses, and I think they will be most clearly explained by very carefully constructed drawings. Unfortunately, it is a matter that involves considerable time, but I am engaged upon it at present, and hope shortly to communicate a paper upon the same subject.—Yours faithfully,

THOS. R. DALLMEYER.

25, Newman Street, November 6th, 1888.



## Proceedings of Societies.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE usual weekly meeting was held on the 1st inst., F. P. CEMBRANO in the chair.

P. EVERITT, referring to the subject of the continuing action of light that had formed part of the discussion at the previous meeting, exhibited a platinotype print which had been kept in the pressure frame in the dark room for a week after partial printing. No difference whatever was observable in the print at the end of the week.

C. H. COOKE remarked that his experience of a print placed in a dry cupboard was the reverse of this; in his case the printing action still went on.

A. HADDON believed the continuing action of the printing was due to a certain amount of moisture absorbed from the atmosphere, and that damping the print would have produced the same effect as keeping it. He suggested cutting a piece of sensitized paper in half, one piece to be steamed and printed-out at once, the other, after being partly printed, to be put away for a few hours. He questioned whether any difference would be found between the two prints.

J. B. B. WELLINGTON, after fixing and washing a platinotype print which had been prepared with gum, had placed it under pressure between sheets of blotting-paper. Part of the gum from the surface of the print adhered to the blotting-paper, which was subsequently used as a backing for printing some silver prints. After printing, the image on the blotting-paper was found to have changed to a sepia tone. He thought this probably due to the damp condition of the atmosphere existing at the time.

A question from the box was read: "Is there not a superior kind of *papier mache* which can be worked like wood? If so, what is its weight as compared with light mahogany, and would not it be better than wood or ebonite for cameras?"

THE CHAIRMAN suggested a material called vulcanite fibre for the purpose.

A. HADDON said it was heavy and very difficult to work, being very tough; the edges of sharp tools were taken off in working it.

J. B. B. WELLINGTON said *papier mache* could not be joined; it would have to be moulded.

THE CHAIRMAN asked if any of the members who had used bichloride of mercury alone as an intensifier had found the negatives liable to fade.

W. COBB said, from experience, he believed negatives intensified with bichloride of mercury alone to be more permanent than those treated with ammonia afterwards. A friend of his—a photographer—invariably uses the bichloride alone.

C. H. COOKE asked if the yellow stain from development could be cleared after the negative had dried.

THE HON. SEC. replied in the affirmative.

J. B. B. WELLINGTON said, to be effectual, the clearing solution ought to be applied after fixing and before washing.

E. R. SHIFTON, of the Cyclists' Touring Club, commenting upon the benefits derived from cycling in connection with photography, promised to read a paper on the subject on the 15th inst.

### BATH PHOTOGRAPHIC SOCIETY.

A MEETING was held on Wednesday evening, the 31st ult., at Messrs. Powell's Rooms, 10, Quiet Street, Bath, AUSTIN J. KING presiding.

THE CHAIRMAN, in opening the proceedings, said:—Although the primary business of a good Chairman is to hold his tongue, and to make other people hold theirs, yet on the occasion of a first public meeting of a Society like this it does seem necessary to do something more than merely introduce the lecturer. The advertisement of the meeting refers to those who are interested in photography; but in good truth, there is probably no man, woman, or child, in the kingdom, who does not fall within this category. The first use made of photography was no doubt the achievement of portraits, at first execrable as they are now admirable. The natural yearning to have a delineation of the features of friends and relatives was so strong that in pre-photographic days it was satisfied as regards the wealthy by miniatures, and in the case of the less fortunate by prints affording accidental likenesses, and by the alteration of existing pictures of other persons. This branch of the art has not lost its interest, and never will. I need not enlarge upon its import-

ance, and upon the gradation of merit which ranges from the threepenny ferrotype of the fair, to such high-class portraiture as to merit the praise of such an art critic as Mr. Ruskin; but the primary use of the process has been so supplemented, that there is now scarcely a science, or profession, or manufacture, or trade that does not find a useful and almost necessary handmaid in photography. The discoveries in the great world of chemical, physical, and physiological science are stereotyped and made permanent by the action of the camera. The study of physiognomy and ethnology receive assistance for which they would otherwise look in vain, and the little cameras which now-a-days are attached to the microscope preserve for other observers phenomena which would, without such aid, be fleeting. Medical men well recognize the value of photography in their curative and pathological studies; and to lawyers, whose business is, or should be, the pursuit of strict accuracy, the uses of photography are becoming daily more important. We have a good illustration in the great trial now pending before Commissioners at the Law Courts. In military circles, a study of the art is becoming a favourite, and, in addition to the more obvious uses, it is probable that the camera which can now be attached to telescopes may be of great practical value in the strategy of the next great war. How indispensable photography, both to civil and mechanical engineers, how useful for architects, are questions upon which I need not enlarge. But few are aware how much the art has not only facilitated but improved the work of the designer, the special artist of your illustrated journals, and the producer of wood-cuts and other illustrations. Manufacturers' travellers carry photographs with them, which often take the place of unwieldy samples. Auctioneers and house agents avail themselves much of pictures which convey impressions which description could not do, and the photographers of the best ancient and modern specimens have done much to improve the style and facilitate the sale of furniture. The archaeologist, reveling in the precise study of what is most ancient, leans heavily on the youthful invention, and travellers are able to impart to others the details and characteristics of scenes which they have visited. Other illustrations will, as I have been speaking, crowd upon your minds, and, I am sure, no thoughtful man will dispute the proposition that sometimes directly, but more often indirectly, photography has made an impression which can never be effaced in the studies, the pursuits, and the pleasures of every civilized man. So much, or rather so little, for the uses of the art; now a few words as to those who practise it. Their number is legion, their characteristics most diverse; but we can with convenience divide them into three classes. In the first we may place the scientists, who use the art as aid to their researches and studies, and who are ever finding fresh fields wherein they can employ it. In the second class we include the professional photographers, whose painstaking and laborious exertions have raised, and are still raising, the art of mechanical portraiture to an excellence which, in the last generation, would have been deemed visionary and impossible. If anyone will refresh his memory by glancing through an old album where he will see the unfortunate victims staring blankly at him, out of a pale yellow fog, and an incipient snowstorm, the form, the shading, and the whole conception as faulty as the execution was deceptive, he will be impressed with the conviction that there was some room for improvement. If, then, he will glance at the shop windows of professional photographers, he will appreciate what that improvement has been, and the mead of praise due to those who have brought it about. But there is a third class—a large one—which is daily growing larger—the amateur. If the range is a wide one of professional photography; if from the lowest to the highest there is a great distance, the range is still wider, the distance still greater, in the case of amateurs. The school boy or school girl who buys something called a camera, and exposes some plates with no result, except a deep sea-green negative once and again, commences the list, which ends with those distinguished scientists who construct the formula upon which others work and earn the gratitude of alike the amateur and professional; men who make each new discovery but a step towards the exploration of newer and further fields. Between this Alpha and Omega, who can measure the stages? But the amateur who may, perhaps, be taken as a fair type, is the one who has a relaxation from the trying pursuits of duty or business—attaches himself to photography as to a friend. He takes, it is true, very bad portraits of his friends; he exaggerates their personal deficiencies, he conceals their excellences of face and form, and he uses dry plates to a number which he confides to no mortal man or woman. Yet, if



he does little for photography—photography does much for him; it gives him a relaxation he greatly needs; it adds a new charm to his life; it tempts him to visit scenery, and churches, and ruins, and extend the scope of his studies and his reading. It is a hobby-horse to ride—a good one, a safe one, and, all things considered, a cheap one; and our friend has an occasional triumph. The tone is vigorous and yet soft, and he can astonish his friends by some really good prints, and can retain most pleasing remembrances of home and foreign travel. Now a photographic society, if it is managed as we hope and believe this young one of ours will be, can be of use to both professional and amateur photographers. The professional has his time taken up with the routine of his business life; he has no time or opportunity to make experiments or try new things. He does not always understand the full reasons of all the scientific processes which he practically so skilfully manipulates. In these respects he can often learn, often take advantage of the trials, the blunders, investigations, and the researches of the more leisurely amateur. The advantages to the amateur are still more obvious. He can correct his mistakes. He can, when he has succeeded (we all succeed sometimes) learn wherein his success has rested, and how to repeat it, and he can be made by the examples of really good work, to recognise, not only that there is a higher standard to work to, but that with perseverance he can, at all events, approximate towards it. The Society has only just been formed, but it has been formed under the best auspices, and I hope that all who join it will take as their motto, "Help one another." The opportunities for mutual help will develop themselves, and the success of the Society will be the success of each individual member. And, ladies and gentlemen, one important help towards this desirable condition will be that our professional and amateur friends will freely give us the benefit of their experience. All who practise photography successfully work in a regular style, and it is only by having our emulations intensified that we can realise what there really is in it. Mr. Friese Greene, whom we all know as a photographer of considerable personal ability, has at some inconvenience come here from London to-night, to commence a course of lectures which will form an attraction to this city of ours. We are cognisant of the difficulty experienced in getting lectures at this stage of our existence as a society, therefore we are all the more obliged to him for his presence. When fairly started we do not apprehend any difficulty about getting papers for our regular meetings.

Mr. FRIESE GREENE then read a short paper on "The effects of electricity on a bromide plate in different solutions, and *in vacuo*, also upon taking photographs unawares" (see page 709). At the conclusion of the paper, the lecturer said the first thing mentioned is that of photographing with the eye. Now, I will sketch this organ on the blackboard, and you may imagine the arrow to be the object. After no end of failures, I succeeded, using an electric arc equal to 2,000 candles. Tonight we will take the flash produced by burning magnesium powder. If you look at the flame, said the lecturer, then close your eyes, some of you will see an image left on the retina, and this can be photographed. (Here there was a general expression from the audience who noticed this.) The next thing I want to bring under your notice, is that of photographing the voice. If I sketch the arrangement, you will be able to imagine that when I talk behind the diaphragm, the vibration of the vocal sounds are registered upon the sensitive plate, and can be developed. Tones of voice are varied, as the number of vibrations. Photographing metallic substances by electricity without the aid of light was next dealt with, silver coins being placed in acidulated water, both in contact and partially so with the surfaces of bromide plates. The silver coin formed the cathode, and the cross-pole of a battery was attached to a platinum plate. Upon completing the circuit, and electrolysis set up for a few seconds, the plates were developed by means of hydroquinone, when good representations of the coins were visible, which he afterwards showed through the lantern. The Kodak camera was next shown, and the three movements necessary to its use explained. Numerous specimens illustrating its capabilities were handed round, many of which were greatly admired. A large collection of photographs taken by magnesium flash light followed, and the lecturer advised all who experimented with this method of portraiture to use an opaque reflector in preference to translucent diffusers, such as ground glass, tissue paper, &c.—these latter rendering the shadows more dense. He preferred magnesium alone to a mixture, there being less liability of explosion. Now, said the lecturer, I will develop a negative of my audience, which,

up to this moment, were not aware that an exposure had been effected. Upon development, a half-plate negative was found to be fully exposed, and moderately successful, as also were others taken by means of the Kodak. The effect produced by electric discharge across a bromide plate *in vacuo* was next shown by means of an optical lantern, more or less complete reduction in the path traversed being the result. The lecturer then handed round specimens of photographs produced by electricity without the aid of light. These were but crude, yet he was hopeful of producing others which might prove to be of great commercial importance. He also drew attention to an adjustable shutter constructed by Dr. Wollaston.

In reply to questions, the lecturer stated that in his opinion hydroquinone was cleaner, cheaper, and more effective than pyrogallol; it kept well, and he regarded it as the developer for negatives and transparencies. The distance of Kodak from the nearest figure in specimens shown was five feet or more.

At the request of the Chairman, a coin was supported above a sensitive plate in dilute acid, and after setting up electrolysis, the image was developed thereon.

The CHAIRMAN said that the keen and intelligent interest shown by all who listened to what Mr. Friese Greene had so well said, and the experiments he has shown us, will be far more satisfactory testimony of our ability to appreciate his skill than any words can convey. I am sure you will give Mr. Greene a cordial vote of thanks for his kindness in coming here. The apparatus and the exceedingly interesting character of the experiments brought forward must have involved much preliminary trouble.

Carried by acclamation.

In reply, the lecturer said he was only too pleased to bring his experiments before the Society, and he thanked those present for the kind manner in which they had listened to him, thereby paying him the greatest possible compliment, which he thoroughly appreciated.

The CHAIRMAN: I have been asked to state that there will shortly be a meeting to elect a committee of officers (at present they are only provisionally appointed) and it is thought right and fitting that all who join before the December meeting should have a voice in the election. All who send in their names to the Secretary at 34, Gay Street, before December, will be considered as founders of the Society, and elected without ballot. Printed copies of the rules at present agreed upon are on the table, and ladies and gentlemen are at liberty to take them in order to see how far they meet with their approval. Owing to the high opinions of the press regarding them, many copies have been applied for as a guide to constructing rules for other societies. Our idea is to hold such meetings as this to-night, also to provide dark rooms for development of plates, &c. Excursions and outdoor meetings are to be arranged during the summer months, so that we may study landscape and architectural photography. These gatherings we can make instructive and learn something from one another. For this reason our number should be very considerable. We have now between fifty and sixty names, and hope to double those figures by December.

Mr. FRIESE GREENE proposed a vote of thanks to the chairman for the very genial and able manner in which he had presided, and especially for his opening remarks, which were so full of intellectual thought, and combined such a mass of information both for the professional as well as the amateur. He impressed upon us that photography led us to nature secrets more than anything else, thereby quickening perception, and inducing a wider sphere of thought.

Mr. PHILIP BRAHAM, in seconding the resolution, said the chairman's speech was not only of interest to photographers, but was calculated to invite everyone to join a photographic society. He could scarcely say anything to enhance what had been already said. The vote was accorded.

The HON. SECRETARY (W. Middleton Ashman) said the Society was deeply indebted to Mr. G. F. Powell for providing such capital accommodation for them that evening. He felt that they ought not to separate without thanking Messrs. Powell for their kindness. Not only had those rooms been placed at the disposal of the Society that evening free of cost, but Messrs. Powell had generously supplied gas as well to illuminate the proceedings. He begged to move a hearty vote of thanks be given to the Messrs. Powell. This was accorded.

Mr. G. F. POWELL, in reply, considered the Society had honoured his firm by holding their first public meeting on their premises, and he should always remember that evening with a great deal of pleasure.



## OLDHAM PHOTOGRAPHIC SOCIETY.

THE annual meeting of this Society was held in the Boardroom of the Oldham Lyceum, on Thursday evening, October 25th, the president, J. GREAVES, jun., in the chair.

The SECRETARY read the 21st annual report, which stated that during the year nine members had joined the Society, making a total of fifty-eight. Of the number five have resigned, leaving a net total of fifty-three members on the books, in addition to five friends elected that evening. The Treasurer's account showed a balance in hand of £11 11s. Twelve monthly meetings had been held, with an average attendance of twenty-five members, and ten out-door meetings. The weekly meetings had proved invariably interesting, and still continued to be well patronised.

The PRESIDENT, in moving the adoption of the report, said the Council had considered the advisability of acknowledging the services of the Secretary, and had obtained a beautifully finished quarter-plate camera, and three double dark slides, with all the latest improvements, inscribed as follows:—"Presented to Mr. T. Widdop by the members of the Oldham Photographic Society, October, 1888." He had very great pleasure in presenting him with that beautiful piece of workmanship.

The SECRETARY fittingly acknowledged the gift.

The election of council for the ensuing year next took place, and resulted in the retiring council being re-elected, viz:—

*President*—J. Greaves, jun. *Vice-President*—Tom Heywood.

*Treasurer*—J. W. Whitehead. *Librarian*—M. Piper.

*Committee*—J. Chadwick, J. W. Cooper, E. H. Dixon, J. Fullalove, Jas. Hall, J. H. Prestwich, and W. Thompson.

*Secretary*—T. Widdop.

A lantern exhibition was afterwards held, when the transparencies intended for exhibition in the Art Gallery were thrown on the screen, comprising views taken by the following members:—Messrs. Bailey, Carper, Fullalove, Hall, Heywood, Nash, Ormerod, Piper, Thompson, and Widdop, the manipulators of the lantern being Messrs. Cooper and Fullalove.

## DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

THE second regular meeting for the session 1888-89 was held in Lamb's Hotel, Dundee, on the 1st instant, J. C. COX in the chair.

Messrs Cairncross, Graham, Miller, Wind, McFurlane, and Macdonald were duly elected members. Four gentlemen were nominated for election at the next meeting.

A motion that the Association should provide an oil lantern for the use of members at their own homes was, after discussion, withdrawn in favour of one to the effect that a studio be procured, and a small committee be appointed to obtain suitable premises and report to the next meeting.

JOHN MATTHEWSON then read a paper on "Exposure and Development" (see page 70). To illustrate how, by careful and slow development, over-exposed plates could be saved, Mr. Matthewson showed five negatives of the same subject which had received exposures of three, six, nine, twelve, and sixteen seconds, three seconds being the correct exposure. These, with prints from each, were examined by the members present, who failed to discover which had received the longer exposure.

The Eastman Company sent for exhibition the detective camera, "The Kodak," the mechanism of which was much admired.

Prints from negatives of street scenes in Dundee, taken on Wednesday, the 31st ultimo, were shown. The negatives were fully exposed, and severely tested the rapidity of the films, the light being very poor.

## CARDIFF AMATEUR PHOTOGRAPHIC SOCIETY.

THE ordinary weekly meeting was held at headquarters on the 31st ult., President ALEX. KELLAR in the chair.

The following gentlemen were elected ordinary members of the Society:—Annabal Pinheiro, J. D. Pritchard, Henry Hill, G. Passadora, W. E. Wiles, Alex. McKinnon.

Vice-President ALLEN, in proposing a vote of thanks to the judges for their labours in connection with the recent Exhibition, which was seconded by the PRESIDENT, and most warmly and unanimously carried, stated that it was regrettable, to a certain extent, that the result financially was not successful; it was true the balance on the wrong side was not very large, and if the Exhibition could have been kept open for a few days longer, the result would have been eminently satisfactory. No blame could

be attached to the Cardiff public, for when they discovered the good thing provided for them, they flocked in to such an extent that the rooms were inconveniently crowded. This fact promised well for the next attempt. Their preliminary expenses had been rather heavy, and several pounds thrown away by more space being applied for than required. He complimented the working officials upon the amount of work they had to get through in such a short time—only two days for receiving, unpacking, and hanging, and something under twenty-four hours to make a clearance from the Town Hall. This was their first attempt, and they must profit by experience. No doubt the Mayor and Corporation would endeavour to give them a longer lease if the Society should wish to avail themselves of the Town Hall again.

The annual dinner is fixed to take place at the Angel Hotel on Wednesday, the 21st inst., and the annual meeting on the 5th Dec. The Society take possession of their new rooms and studio on the 1st December next.

## BOLTON PHOTOGRAPHIC SOCIETY.

THE annual meeting was held at the Baths, Bridgman Street, on November the 1st, President J. R. BRIDSON in the chair.

The HON. SECRETARY read the annual report, which showed the Society to be in a flourishing condition, the number of members being larger than at any other time. The audit of Treasurer's account shows a greater balance than it has ever had.

It was decided to hold the second social evening or smoking concert on the 6th of December, and that the annual exhibition of members' work be opened on the 7th of February, 1889, and be closed on Saturday the 9th.

W. S. Walker was elected a member.

A variety of apparatus was exhibited.

Dr. JOHNSTON brought for inspection the Monthly Album of the Argosy Postal Photo Club; many of the prints were much admired.

The meeting was one of the largest the Society has had.

## CAMERA CLUB.

ON Thursday, November 1st, H. M. ELDER read a paper on "Toning Silver and Bromide Papers." S. B. WEBBER occupied the chair.

In his address Mr. ELDER touched upon the ordinary points of gold toning, and then proceeded to describe the means he used to change the colour of the deposit in bromide papers. The methods were demonstrated before the meeting. The process was uranium intensification. The prints were treated with acid, then with the uranium nitrate bath, and finally in either alum or hypo, according to the colour required. Washing between each operation was necessary. The general result was to change the colour to warmer shades, and that without any staining of the paper.

The CHAIRMAN thought this a very favourable opportunity for insisting on special cleanliness in all toning operations.

T. EYRES agreed that cleanliness was of the first importance, and described exactly his method of handling prints in the processes of toning and fixing.

Further remarks were made, and the subject gone into in some detail by Messrs. Lionel Clark, Rodgers, Davison, Stroh, King, Austin, and Greene.

The CHAIRMAN, at the conclusion of the evening, proposed a vote of thanks to Mr. Elder for his deeply interesting address.

This was cordially agreed to.

Thursday evening, November 15, will be devoted to the lantern.

## NORTH MIDDLESEX PHOTOGRAPHIC CLUB.

THIS Club held a meeting in the Iron Room, Stroud Green, on Monday evening, the 5th inst.

E. TRAILL HISCOCK read a paper on "The Printing and the Development of Argentic Opals." After making a few introductory remarks, he (Mr. Hiscock) impressed upon his audience the necessity of having everything used in the manipulation perfectly clean, as dirt of any sort would prevent the making of a good picture. With regard to developing, the only formula which was successful with opals was the ferrous oxalate, the directions for the making of which he gave. When developed (when sufficient brilliancy in the shadows has been obtained), he advised the washing of the plate with cotton wool, and thus remove all traces of the iron. To fix, he used a solution of 3 oz.



hypo to the pint of water, and allowed the picture to remain in this bath from ten to fifteen minutes. After having eliminated all the soda, the plate is cleared in a bath of 1-ounce sulphuric acid to a quart of water; it is then again washed, and dried. In order to illustrate his remarks, Mr. Hiscock printed and developed an opal (Messrs. Fry's), obtaining a most perfect result, which was greatly admired by the members.

Mr. STEWART spoke of the autotype and transferotype processes.

The next meeting (Monday, 19th inst.) will be the lantern night, admission to which will be by ticket only, obtainable by those interested in lantern slide work, of the hon. sec., Ernest F. C. Damant, 20, Granville Road, Stroud Green, N.

On the 3rd December, C. OAKLEY will give a demonstration on "Eularging," to which visitors are invited.

## Talk in the Studio.

**COLOUR-HEARING.**—The *Scientific News* says:—"Mr. J. A. Maloney, after describing in the *New York Medical Journal* and *Science* some interesting experiments on the conduction of sound vibrations by the bones of the skull, asks:—"May not colour-hearing, in view of the readiness with which the sphenoid bone takes up and delivers vibrations, be due to mechanical stimulation of the optic nerve by the impingement upon it of the sphenoid bone in its passage through the optic foramen?"

**RUSKIN ON THE ART OF PAINTING.**—The following remarks are perhaps quite as applicable to the art of colouring a photograph as to the work of the artist who constructs a complete picture by the brush. We quote from the fourth appendix of "The Two Paths" (the 1859 edition), which is itself illustrated with a frontispiece copied from a Daguerreotype:—"The art of painting, properly so called, consists in laying on the least possible colour that will produce the required result, and this measurement, in all the ultimate—that is to say, the principal—operations of colouring, is so delicate, that not one human hand in a million has the required lightness. The final touch of any painter properly so named—of Correggio, Titian, Turner, or Reynolds—would be always quite invisible to any one watching the progress of the work, the films of hue being laid thinner than the depths of the grooves in mother-of-pearl. The work may be swift, apparently careless—nay, to the painter himself, almost unconscious. Great painters are so organized that they do their best work without effort; but analyze the touches afterwards, and you will find the structure and depth of the colour laid mathematically demonstrable to be of literally infinite fineness, the last touches passing away at their edges by untraceable gradation."

**PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.**—The first ordinary meeting for the session will be held on Tuesday next, at 5A, Pall Mall East, at 8 p.m., when a paper "On the measurement of the sensitiveness of salts of silver to the spectrum" will be read by Captain Abney, C.B., R.E., F.R.S., and a new detective camera will be shown by Frank Nowlan.

**LECTURES AT THE GALLERY OF THE ARTS AND CRAFTS.**—At the first lecture of the series a large audience assembled to hear William Morris discourse on "Carpet and Tapestry Weaving," and we have before referred to the fact that photography takes an important part in the reproduction of sketches for the designs of the Merton tapestry. The fact that the subject is often sketched on the warp—and the sketching has to be so done that each thread has to be marked all round—suggests the possibility of employing photography for putting the subject on the warp. Of course precautions would have to be taken against the shifting of the warped threads. Morris dealt about as largely with the artistic side of tapestry work as he did with the technical. One merit of tapestry work from the artistic side is that it affords excellent means of finely rendering the "unlaborious result of the ready artist," and "excellent scope for the laborious artist of moderate capacity;" the result being "fitter for use than the actual handiwork of the ready artist." Morris instanced fine tapestry as a form of art excellent for public purposes; we assume he meant for the decoration of municipal or national buildings. He said if you will have worthy public art, you must give up some luxury for it—"You cannot have wealth and riches at the same time; no power on earth can give you both." The audience sufficiently understood

the distinction between *wealth* and *riches*, which has been emphasized by Ruskin, to applaud Morris's final words.

**PHOTOGRAPHIC CLUB.**—The next meeting will be the annual dinner on November 14, at 7 prompt. There will be none of the usual technical business on that evening.

## To Correspondents.

\* \* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER AND CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

ISO.—The yellow screens are sold by J. R. Gutz, of 19, Buckingham Street, Strand, London.

FRANK M. SUTCLIFFE.—If you write to the secretary of the Photographic Exhibition it will no doubt be sufficient, as there is a department in the Russian Post Office for the translation of addresses.

C. HETHTON LEWIS.—1. Unless we know the composition of the mixture, we can form no notion whether it would be injurious. 2. Thank you for the communication.

W. J. B.—Your data are not sufficient for making the determination.

E. V. BOISSONNAS.—We have replied by post.

MORE LIGHT.—1. The back combination does unscrew, but has evidently become fixed in its position. As your remarks show that you are not sufficiently versed in mechanical manipulation to loosen it, you had better send it to Dallmeyer's and ask them to release it for you. The front combination with the stop behind it will give "pine-shion" distortion, and the back combination with stop in front will give "barrel-shaped" distortion. 2. A small book in English is published by Solomon, of Red Lion Square, and a very excellent and comprehensive hand-book, in German, is published by Liesegang, of Dusseldorf. 3. A book on this subject, by Bool, is published by Piper and Carter, price 1s. 4. See the current YEAR-BOOK. 5. Sands and Hunter made such a shutter some years ago, and if you write to them they will probably send you particulars. Their address is 20, Cranbourne Street, London.

TWO HUNDRED AND FIVE.—1. The Magnesium Metal Company, Manchester. The price in London is about half a crown an ounce. 2. You can only register a design; an apparatus, as such, must be the subject of a patent.

F. W. DYMOND.—In such cases we have generally advised our readers to write to the chief constable of the town concerned, and the result has generally been satisfactory.

A. G.—The sky is backed out with a water-colour paint, the pigment being apparently raw sienna. Rub a cake of the colour with water to the thickness of stiff cream, and if it works greasily on the film, add a little prepared oxgall.

PHOTOPHIL.—There are several aniline blues suitable, of which you can obtain samples from dealers. The so-called Lyons blue (Phenyl Roseaniline) answers well.

FORESTER.—We recommend you to discard the Ruby and to use the "Golden Fabric." Of this latter you may perhaps require three thicknesses.

W. H.—You will find details in Abney's "Instruction," which is now in print again.

## The Photographic News.

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# THE PHOTOGRAPHIC NEWS.

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### DISPOSING OF THE FUMES FROM BURNING MAGNESIUM.

THE increased attention which has been bestowed upon photography by artificial light since the introduction of more sensitive photographic processes, and the cheaper production of the metal magnesium, have done so much to facilitate progress in this direction, has shown itself recently in the various methods that have been contrived for burning the metal in the most advantageous manner. The lamp of Schirm, described in the PHOTOGRAPHIC NEWS of September 28th last, appears to be especially successful in evolving a large amount of practically useful light from a given quantity of the metal, since Dr. Eder speaks of the combustion of about three-quarters of a grain of metal being sufficient for the purpose of illuminating a figure to be taken as a portrait by photography, and adds that the fumes from such a small quantity of metal may be disregarded. Where, however, several photographs have to be taken in succession, there is no doubt that it is eminently desirable to have some method of getting rid of the fumes which are formed, and to this end we welcome an article by Dr. A. Meydenbauer, which appears in the *Photographische Wochenblatt*.

Dr. Meydenbauer points out that the magnesia formed by combustion is the greatest enemy of the magnesium light. A given quantity of the metal, he says, gives out more light, when burned in a thin ribbon in the air, than when employed as a powder in combination with substances giving up oxygen. In the latter case some of the light from the burning fragments of magnesium in the interior of the flame is obstructed by the magnesia which has already formed at its outer edge, whilst with the small flame of the burning ribbon the proportionate loss of light is less. On the relative merits of burning magnesium powder, in conjunction with an oxygen-yielding compound that forms an explosive mixture with the finely divided metal, in comparison with the plan of burning by driving it with a puff of air through a flame, Dr. Meydenbauer expresses himself on the whole in favour of the latter, although, as he points out, the individuality of the operator—the personal equation—steps in. The force of the blast, depending as it does upon the pressure applied to the india-rubber ball that supplies the wind, it follows that this force will vary with different individuals, and with the same individual at different times. The advantage, however, is—particularly with the apparatus of Schirm to which we have previously referred—that a very small quantity of magnesium, in comparison with that employed in an explosive compound, is necessary to produce a given amount of photographic action.

The greatest hindrance, then, to a more general adoption of the magnesium light in photography being the production of those white fumes which result from its

combustion, and to the difficult task of finding a means of getting rid of these fumes, Dr. Meydenbauer has, he tells us, devoted himself for the past three years. When solid magnesium is burned in the air, there remains a portion as a white ash, whilst another portion is disseminated in the atmosphere as a thick, white cloud of smoke. The solid ash represents about one-eighth of the original magnesium, whilst the remaining seven-eighths are distributed in the air. This smoke settles readily upon the surface of any solid body, and with a readiness in direct proportion to its density. It is this last consideration which has led Dr. Meydenbauer to the construction of an apparatus which he has found to be successful in trapping the fumes, and which for use with a magnesium ribbon lamp he describes as follows.

Immediately over the point where the magnesium is burned, and just at the top of the tongue-shaped flame, is fixed the bottom of a tin or iron plate tube of about one inch in diameter. The bottom of the tube is an inverted cone, having an opening of only from three-eighths to half an inch in diameter. It is thus secured that the fumes are not diluted with more air than is necessary to obtain a draught up the tube. The tube must be of a length of at least forty inches, and vertical, so that a powerful draught may be created. A light box is fixed on to the top of the tube, and the joint where the tube enters is made smoke-tight; an ordinary cigar box suffices. At the bottom of the box there is also another tube made of paper, and of two or two-and-a-half inches diameter. This tube descends some distance, and then enters an ordinary bandbox. By fixing the lamp and tube to a light bar reaching high enough to support the box, the whole thing may be conveniently carried about. The apparatus will hold the products of combustion, which may be kept up for hours together. The magnesia settles for the most part in the tubes and in the box at the top; what remains is carried over through the paper tube and settles in the bandbox, which may be removed from time to time as necessary. On the principle described, Dr. Meydenbauer has constructed a ten-band magnesium lamp, and found no difficulty in trapping the magnesia produced.

For architectural interiors at night, Dr. Meydenbauer finds that he obtains results leaving nothing to be desired, either in the softness of the shadows or vigour of the lights. For such subjects he moves the lamp about during the exposure, so that every part may receive some illumination, and keeps the light longest at the spot wherever he desires his principal light effect. For indoor portraiture, this simple apparatus appears to supply a want that has been so long felt in a manner more complete than was generally hoped for.

By means of this contrivance of Dr. Meydenbauer the greatest obstacle to the use of magnesium as a photographic illuminant appears to be removed. As he ob-



serves, there are many subjects which can be better photographed by artificial light than by daylight. Interiors of dwelling-rooms, small works of art in churches, and similar objects, can be better lighted up artificially than by the help of what daylight may be available in the position in which they may be situated. The solarisation which occurs so often in some portions of unfavourably lighted interiors, and the reflections which occur so commonly in works of art in the places where they hang, are sometimes such insuperable drawbacks as to prevent a really good result from being obtained by daylight, but for success with which photographers have been waiting with longing for some practical method of artificial illumination that should be without the drawbacks hitherto attendant on such means as were within their reach.

The apparatus of Dr. Meydenbauer seems to have solved the problem of disposing of magnesia fumes when ribbon is employed, and doubtless, for most purposes, this is the method of burning that will be generally adopted. Whether a modification of the same apparatus will prove effective when burning powder with a rapid puff is another matter. There is, however, an apparatus of another kind in existence for the latter purpose. The prospect of photography by artificial illumination obtaining a more extended sphere of operations than hitherto is certainly great.

#### A PHOTOGRAPHIC TRAVELLER'S ALLEGED BREACH OF AGREEMENT.

In last week's issue we noticed the trial and an action in the City of London Court which came before Mr. Commissioner Kerr, and which raised questions of importance and interest to all those in the photographic trade. The proceedings were instituted by Messrs. A. & G. Taylor, Photographers, of Queen Victoria Street, E.C., to recover monies said to be due under a certain agreement from Mr. Henry Vernon, who was formerly in their employment as a traveller, but who is now in business on his own account at Brighton. It was alleged that he had undertaken by the agreement to perform certain duties and obtain certain orders, but that he had committed a breach, and they therefore brought this claim. He denied his liability, and after a rather long hearing he succeeded in persuading the learned Commissioner to non-suit the plaintiffs.

Another action was, on Monday, brought by the same plaintiffs against the defendant under somewhat similar circumstances, and this was tried before Mr. Commissioner Kerr, the same as the other. The defendant said by the agreement the plaintiffs had discharged him from any liability for the amount in respect of which they had now sued him. The arrangement was that they should deduct all bad orders—that was, orders for which they did not receive payment—off the current accounts, and now they had gone and sued him for them. He had been brought up from Brighton, away from his business, to defend the action.

Mr. E. B. Tattershall, who appeared for the defendant, said the case would take some time to try; there were some sixty or seventy items in the accounts to go through. He suggested that the matter should be referred to arbitration.

The plaintiffs could not see that this was necessary. The figures were accurate.

The learned Commissioner replied that if that were so, the defendant was liable.

The defendant said the accounts were two years old.

The learned Commissioner said that did not alter matters. If the Statute of Limitations were six months instead of six years he would be pleased. The defendant gave the strongest possible reasons for the matter being referred.

Ultimately, by consent, all matters in difference were referred to the arbitration of Mr. Deputy-Registrar Quilter.

#### CHAPTERS ON ELEMENTARY PHOTOGRAPHY— A GUIDE TO BEGINNERS.

BY W. M. ASHMAN.

##### TWELFTH ARTICLE.

PERHAPS no subject offers such an attraction to the photographic tyro as that of the miniature Venus of the household, or infantile tyrant, as sometimes called; but it is probable that the success which may be achieved will be small when compared with the amount of necessary energy displayed.

It has been related of the late O. G. Rejlander, that having exhausted every means known to him by which to get a successful negative of an infant in trouble, and almost driven to despair, he suddenly conceived the idea of sitting this subject upon a cold marble slab, to induce the child to cry with great vehemence. The trick had the desired effect, and the once celebrated picture of a crying infant, entitled "Gin's Baby," was the result.

Young children and babies are, without doubt, trying subjects for any photographer; but if he be possessed of an exceptional amount of patience, and employs a lens of the rapid rectilinear type, of short focus, for out-of-doors, or a portrait combination indoors, an excellent negative may be the result. Such pictures, however, are very difficult to obtain at all in an ordinary room, as amateurs soon discover for themselves, as the exposure should only occupy a fraction of a second. To this end an exceptionally good light is necessary, as well as a quick-acting lens and a rapid plate, and the subject should be placed in a line with the axis of the lens. The movements of an infant being so uncertain, no possible precautions should be neglected. The writer has had a large practice in children's portraiture, and is convinced that next to the facilities offered by quick-acting lenses, good strong light, and plates giving as high a sensitometer reading as 24° (Warnerke), is the possession of that special ability which enables one to decide quickly upon the proper moment at which to venture upon making an exposure.

Young children, when allowed to roam wherever they please, at the time they are supposed to be having their portraits taken, give a great deal of trouble to the photographer in his efforts to focus them accurately upon the ground glass screen. The slightest movement forwards or backwards, after this is done, will very likely destroy the sharpness and spoil the image, especially with the quickest form of portrait lenses. Yet it often happens that by some slight movement a more attractive pose has been assumed, and a sudden desire to secure the improvement induces one to hazard an exposure.

Owing to this constant changing of position on the part of the little sitters, the writer has recourse to the following general plan of action; always first endeavouring to focus properly in the position most desirable for effect. Taking some point which will eventually be near the centre of the field of view, this is focussed as sharply as possible; then, when all is ready for an exposure, except perhaps the subject, some one or more artifices are resorted to for the purpose of inducing that subject to assume the attitude or occupy the place desired.

Very young ones can often be restrained *in situ* long enough for the photographer's purpose by passing a broad tape around them under their dress, and securing the ends to a chair back, or to some other piece of furniture. Of those objects most frequently used to attract the attention of the youngsters, a lighted taper, or the striking of a match, is, perhaps, the most useful. Musical boxes, sand toys, squeakers, dolls, and other nursery paraphernalia, may be of assistance. The main thing, however, to remember is, endeavour to get a position which will afford a rest against some solid accessory or other practically steady support; choose the proper moment when this is being made use of in the best available pose, and then be prompt to take advantage of it by securing the picture desired.



Other objects no less tedious are dogs. The natural position of these animals when resting is of course on the ground, but here a difficulty occurs, as the lens would require to be lowered more than is often convenient. This is generally overcome by posing the animal upon a wall, balustrade, step, table, or some other elevation varying with the size and character of the dog. The more secluded the place chosen, the greater the chances of success, for the auditory nerves being so much more sensitive than those of man, greater risk is run of some sudden movement during the exposure from sounds almost inaudible to the onlooker. The result is, of course, destruction of sharpness by reason of the movement of the head. The utmost calmness and quiet should be observed on and around the premises when really good photographs of dogs are wanted. Excessive noise of any kind, even when it is necessary to make them look up, seldom acts favourably.

When the light is exceptionally good, a detective camera may be used, and the adjustments of focus and position can easily be seen by means of the finders; a light foreground and a sombre background add to the effect when the dog is of light colour, and light surroundings generally are the best conditions to choose if the dog be dark.

Cats are still more difficult to photograph than dogs, except where a chance shot can be made out of doors, in a favourable light, without the animal being cognizant of the fact. Posing cats and kittens for photography, especially in places a little strange to them, will very often give endless trouble. This is due entirely to the nervous temperament of the feline race generally. The greatest success is met with when the picture is taken in a place with which the animal is familiar, and perhaps when posed by those to whom they are attached. As with dogs and babies, the trouble chiefly lies in obtaining facilities for working quickly. An examination of some of the beautiful specimen photographs of children and animals which are issued from the studios of clever professional photographers will be of considerable advantage to the student as a guide to methods of lighting and posing. Those who can obtain copies of Anschütz's marvellous photographs of animals and birds produced, we believe, by order of the Prussian Government, will find much to study and instruct in this particular direction.

The next step an amateur usually takes is that of photographing the homestead, from the interior as well as the exterior. In the former case, a wide angle rectilinear lens is best suited to the work, and here again a rapid plate may with advantage be used. One of the chief difficulties which is likely to be encountered is that of halation or blurring of the image surrounding bright objects. This is due to the rays of light becoming reflected from the back surface of the glass of the dry plate during a prolonged exposure; probably the light emanating from a bright object passes through the plate, and is reflected back, and the process repeated a great number of times, for we find that the greater the contrasts in light and shade in any interior, the more is halation likely to be observed. Fol's backing sheets (see PHOTOGRAPHIC NEWS ALMANAC) may with advantage be employed. One of these is placed at the back of each plate before putting into the darkslide. Then rays of light passing through the film to the back surface of the glass become absorbed totally, and thus prevent the mischief complained of. Carbon tissue moistened in glycerine and water answers a similar purpose, and is generally employed by the writer. We shall continue the subject in our next.

#### A VERY ACTIVE CLUB CANVASSER.

HE was a soft-speaking, mild-mannered young man. He was sure he could do a great deal of business if I would start the Club system, and put him on as canvasser. All he wanted was a moderate commission, and there would be no possible risk so far as I was concerned.

"You know nothing about photography?" I said.

"No, sir; but I dare say I could pick up sufficient to enable me to talk to the customers," said he, earnestly.

"Well, I'll think over it."

I did think over it, and the result was that I thought I would try the Club system. Business had been very bad; indeed it had been gradually getting worse and worse. I could put it down to nothing but the competition of the Club system, which two or three of my rivals had introduced and were pushing vigorously. I quite saw the necessity of fighting them with their own weapons, and Mr. Lamb's offer came in very opportunely.

I accordingly wrote to him, and asked him to call. I was even more pleased with his appearance and manner at the second interview than I was at the first. He took a keen interest in everything relating to photography, although, as he had very truly stated, he was quite ignorant of the art. We spent a very pleasant hour together in the studio, his intelligence enabling him to grasp all the chief points in the manipulation of a negative very readily.

"Why, Mr. Lamb," I said, "it would not be a bad thing if you mastered the art. You would be able to do a little operating when the busy time comes on."

"I should only be too pleased, sir," said he.

"Canvassing, I am told, is very up-hill work, and although I don't want to discourage you, I must say I think you will have all your work cut out to earn a livelihood on the small commission you propose."

"Well, sir, I'm not one to spend much money. I've always been brought up to save a certain percentage every week, no matter what I earned."

"And a very admirable education, too. Well, go to work! See what you can do."

The first week promised exceedingly well. The fee for the Club membership was half a guinea at a shilling a week. Mr. Lamb, of course, received his commission on the total amount. The second week was even better than the first, and I began to think I had done a first-rate thing in starting the Club system, and especially in engaging Mr. Lamb.

One thing, however, puzzled me, but as I was new to clubs, I took it as a matter of course. Still it was rather curious that although the members paid their subscriptions, none of them appeared to have their sittings.

Mr. Lamb seemed to be as much surprised as myself, and he frequently asked me whether Mr. So-and-so, or Miss This, or the other had come to be photographed.

"I think, sir, I had better tell them when I call next week to hurry up, because they may take it into their heads to come all at once, and then you'll be driven into a corner."

"True; but then will be the time for you to show whether you can do as well in the studio as at canvassing. By the way, would you like to have another lesson this morning?"

"I shall be very glad indeed, sir," said he gratefully.

He had his lesson, and went to work at canvassing afterwards. He never seemed tired, and that very evening brought in more new members than he had ever done before.

The third week arrived, and so did two or three club sitters, but they represented a very small number of the names which I had in the club books. I always knew that people had a decided disinclination to sit for their portraits, but I had never noticed this disinclination show itself in so marked a way.

At the beginning of the fourth week a young lady called to know whether the proofs of her portraits were ready. I could not recognise her as having taken her photograph, and told her so.

"No, that is quite right," said she; "I was taken at your other studio."

"My other studio?" I repeated; "but I have no other studio."



"Well, but you must have, because I was photographed there. You have my name as one of your club members."

Yes, I found the name and address. There was evidently some mistake, but to make things right I took her again. When Mr. Lamb came home that evening I named the matter to him.

"There," he exclaimed indignantly—that is, as indignantly as his manner would allow him to be—"I've been suspecting for a long time that the canvassers for the other clubs have been on my ground. You may depend upon it they've been watching me and calling upon my customers and getting hold of them somehow. I'm very glad you've told me, because I shall now be able to convict them of their disgraceful behaviour."

It is unnecessary to say that I also was enraged at this underhand proceeding. I was fairly friendly with my rivals, and I did not think they would take advantage of me; but it was pretty certain that their canvassers were jealous of Mr. Lamb's success.

We sat talking for quite an hour over the business, and Mr. Lamb determined to devote the next day to calling upon all the members and exposing the deceit. It was now quite clear why it was so few sitters had come to me.

The next morning I had two or three more persons for proofs. They each told me the same story—namely, that they had been taken at my other studio. Another thing also I discovered: all had paid in advance not 10s. 6d., but five shillings, which they said was the inducement, 7s. 6d. being my usual charge. I grew more and more indignant at the other canvassers, and determined the next morning to call upon my rivals, and have it out with them. In the meantime I would wait and see what Mr. Lamb had to say. However, he did not present himself, but by a messenger came a letter stating that he had had a most tiring day, and was really ill with a bad cold he had caught the day before; but he would be certain to call in the morning.

The morning came, but Mr. Lamb did not. As he did not present himself by dinner time, I grew uneasy, and fearing he was worse, determined to call upon him at his lodgings. I did so, and on enquiring for him, was staggered with the reply I got.

"Why, sir, Mr. Lamb went away by the first train yesterday morning. He paid his rent, packed up his things, and said he was going to America."

"Are you sure you are telling me the truth? Why, I had a letter from him last night saying he was too ill to come out."

"Oh, yes, that's all right. He left it with my boy to take to you, and said he was to be sure and not deliver it until the last thing at night, because you would not be at home."

My heart sank. There was a mystery somewhere, the unravelling of which boded me no good. I rushed away to my rivals and told them all. They laughed at the notion that their canvassers had anything to do with the business. At one studio the canvasser happened to be on the premises, and he was called.

"Oh, yes, I heard something about it. Mr. Lamb told me that you had opened a studio in — Street," naming a street at the other end of the town.

"I must find out what this other studio means at once," I exclaimed, and I instantly set out for — Street. Here I found a tumble-down, delapidated studio at the back of a tobacconist's shop, on the door-post of which I saw my name stuck in the cheapest style of letter writing.

"Mr. Lamb, sir?" said the tobacconist. "Oh, he's been gone a couple of days. He only took the place by the week, and his fourth week was up yesterday. I'm sorry he's gone, for he was an obliging young man, and paid his rent in advance to the minute. Did a wonderful business on Saturday afternoons and Sundays, sir, and was most industrious."

And industrious indeed I found he had been, having in the three weeks collected some £20, which £20 I had

either to refund or make up with portraits. The method of the ingenious Lamb was to make out to the customers that I had taken an additional studio especially for club work, and was able to work much cheaper. The five shillings charge—half-a-crown less than my ordinary cash charge, and five-and-sixpence less than the weekly payment system—brought in sitters by the score. As to Mr. Lamb's performance in the studio, he had made use of a cheap secondhand camera, and, thanks to my instructions, had gone through the formula of taking portraits, and no doubt in the dark room, while pretending to develop, indulged in many a snigger at the way he was taking in the sitter and taking my money as well.

I never hear now of the Club system without a shudder.

## THE BATH SOCIETY AND ITS PROCEEDINGS. TAKING A PHOTOGRAPH WITH THE EYE.

BY JOHN SPILLER, F.C.S.

INVITED to take part in the proceedings which, in September last, resulted in the formation of the Bath Photographic Society, and feeling the fullest sympathy with Mr. Philip Braham, Mr. Friese Greene, and others who were present, including our time-honoured representative Mr. James Glaisher, I regret that the kindly worded intimation did not reach me in time to join my friends at their inaugural meeting. From your report in the NEWS it will be seen that a paper was read at the October meeting by Mr. Friese Greene, in regard to which I beg leave to offer a few remarks.

First statement of the author:—"When I say you can take a photograph with the human eye it seems marvellous; but I have done it, and shown the results before the British Association." Undoubtedly true, for in the year 1854, my then colleague, Mr. Allan B. Dick, and I, took photographs with a bullock's eye, and sent the results to Dr. George Wilson, of Edinburgh, who had asked us to do it, and soon afterwards published the fact in his "Researches on Colour Blindness," page 165.

Dr. Wartmann had stated that the humours of the eye cut off the chemical rays, so that they did not impinge upon the retina. We proved him to be wrong by actually photographing a key, spotted window curtain, and other things placed in front of the eye, and succeeded in fixing the tiny images upon Talbotype paper. Later on the subject came up again, and the PHOTOGRAPHIC NEWS of December 23, 1859, published an account of our experiments. True it was only done with a bullock's eye, but there is no radical difference in structure between this and the human eye.

Secondly, the author proceeds: "Now I am going to tell you something that has never been mentioned before. I am going to tell you I can photograph the voice. I was not sure of it last week, so I could not notify it in my paper." Mr. Greene proceeds to describe how it was to be done; but here, again, the experiment is only a modification of Mrs. Watts Hughes's "Voice Figures" and apparatus, which were exhibited at the June soirée of the Royal Society, and were shown afterwards, by my request, at a conversazione of the Highbury Philharmonic Society on 1st October. The numerous specimens were greatly admired, and the only difference seems to be that Mrs. Watts Hughes photographs them direct, whilst Mr. Greene works with a reflected ray. In both cases "the vibrations of the parchment diaphragm, caused by talking to it, will be recorded on the sensitive plate after developing, and different voices will give different vibrations."

There is plenty of room for further investigation of the subject, and let not Mr. Friese Greene relax his efforts on account of anything I am saying about the absolute novelty or otherwise of his proceedings. Far from it: may Bath in every sense supplement the work of London, and vice versa.



# THE SUTCLIFFE EXHIBITION IN THE CAMERA CLUB-ROOMS.

THE Journal of the Camera Club gives the following account :—The smoking concert was made the occasion for the opening of the first of the series of the Club One-Man Exhibitions. Several representatives of the press were present for the private view, and very keen interest was excited by the collection of pictures. As will be seen from extracts from the very interesting and amusing letters sent by Mr. Sutcliffe, he is under the influence of such traditions as prevent his daring to allude to photographs as pictures. Being prejudiced rather in the other direction, we have no such hesitation, and would class some of these prints amongst the finest pictures that have ever been done in photography. Altogether, the exhibition is one of the most interesting and instructive that could be organised. Mr. Sutcliffe's work is varied and good in every direction. Whistly affords good material for a photographer of such instincts, training, and cultivation. Pilots, fisher-girls, whalers, cobbles, herring-boats from every coast are requisitioned by his receptive camera. Effects of light and shade, cloud and sun, appeal to him as to few photographers. It is a lesson to camera men to go out before ten, and after four, instead of between those hours, and instead of invariably waiting for brilliant light and almost vertical sun. In figure-subjects, it is worth noticing how careful the artist has been to bring his figures against a background softened by being at such a distance as to put it out of focus, or toned down by intervening atmosphere, thus giving the principal object relief and force. This is hardly the place to enter into a minute and keen criticism of what there may be defective, and to our members it is not necessary to make any further distinction of what are held to be the finest works than is shown by the position of the several frames.

Some few of the very best have no distinguishing position, owing to their having arrived too late to mount for the opening day—"The Last Load," "Some Effects of Mist" (No. 263), and particularly that which we have called "Towards the Setting Sun." Concerning several of the pictures, and of his own career, we will let Mr. Sutcliffe speak for himself, and we publish here extracts from descriptive letters which he has kindly written in answer to our requests :—

MR. SUTCLIFFE writes :—I am very pleased to hear that you consider the exhibition such a success. Pray don't apologise for asking questions; it is quite a pleasant relief to turn from water-rate questions, income-tax, house-duty, &c., which are bothering the life out of me, to answer them.

1. In answer to question about skies, we do not prepare collodion negatives from those requiring separate printings. I should if I had time, and patience, to do so.

2. None of the photographs are combinations of figure or foreground with painted backgrounds, except one or two heads and one three-quarter figure, which were taken in the studio (333), and the "Old Whaler's Head."

3. "Morning" is a copy from a silver print; we unfortunately broke the negative, so I had to copy the best print we had left. The "Winter's Morning" was taken at 12 on December 21st.

4. "Excitement" *Pons asinorum* was a crowd of boys who had collected while I was taking 303. I sent them off to run a race. When they returned, one or two of them were looking over at a boat below, so I sent the rest to make excitement greater.

I am very sorry that I have not a portrait of myself. I was once taken on the sands on glass by a touting photographer, along with my wife, but she won't part with it. I was also taken when a boy at school. I am afraid I cannot describe myself very well. A nephew of mine says I am very like Julius Cæsar, but I am not sufficiently well read in Roman history to know whether he had red hair or not. An old woman once told me I looked like a linen-draper, because I had long arms and could reach things off the shelves. You ask for a note or two of my eventful career. Well, I was born by the road-side. My father was a landscape painter, member of the Institute of Painters in Water-Colours. I used to roam about hill and dale with him, eating blackberries, climbing trees, tickling trout, catching butterflies, bird-nesting, gathering wild flowers, till I was fourteen, when some one said it was time I was doing something; so I was sent to a brewery in Leeds to learn to be a clerk. But the smoke and noise were too much for me. On the top of a bookshelf I found a book, "On Photography, Lake Price." I wondered why the "lake" price

for a book should be different from that charged elsewhere. I took it down to see. My father, who saw me, said: "I think you'll have to try photography." You see my mother had told me from earliest infancy that she would have me smothered like the Princes in the Tower if I showed any inclination for being an artist. She thought all artists little better than lunatics. For years I used to dream that a man was coming to smother me. My sleeping-place was Bolton Castle, and for years I dreamed that I had to get up and run away down the Castle steps.

My father found me an old camera, and made part of an out-house into a dark room. I then used to amuse myself with photographing the neighbours, &c. When I was seventeen my father died. He got caught by the tide on the rocks while painting, not far from here. This brought on heart disease. A friend of mine, who knew Mr. Frith, got him to give me some work among the abbeys, &c., in Yorkshire; but the price paid did not cover my expenses in having to wait for fine weather—abbeys, &c., wanting the sun, of course. I had before this had a summer on the lakes, photographing for a lot of friends of my father's who had houses at Derwent, Ullswater, and Conistone. I then decided to take a situation in a photographer's studio. I waited for three years, but the much-looked-for place never came. I then thought I would build a studio for myself, and decided on Tunbridge Wells as the best place. Having read so much from the pen of H. P. Robinson about charging well for your work, I, in my innocence, thought the photographers there would get better prices than elsewhere. I expected H. P. R. would charge at least £4 a dozen for carte portraits. I spent some £600 on studio—all I had; was there nearly two years; had only fifty sitters; sold all up to pay increasing debts; came back here; turned a jet-shop into a studio; am here still, taking portraits of babies and twins, and groups of young children, and old maids. Sometimes I get out with my camera before breakfast. If I venture out in the daytime I am sure to meet a fond parent who is bringing little Johnnie to be taken again, as his grandmother (who is nearly blind) thinks he is laughing too much. How I envy that Italian photographer who can afford to refuse to take all sitters but those he thinks will make good pictures.

You asked for description of incidents connected with the photographs. Am afraid I can't send you any. I have just had all the life knocked out of me. A man, one of the North-Eastern Railway Company's men, has just been here. Said he had a son who wished to become a photographer. I asked if the lad was strong. His father replied that he was not, but thought that did not matter. In fact, he said his son was subject to fits. He had been to sea, but had had a fit one day, when up aloft. Had fallen down on the deck and broken his arm and thigh. Had had to leave sea, and had been fit for nothing ever since; so he had come to see if I could make a "likeness-taker" of him. What is the use of anything after that?

I expect I must start with the description. Wish you would let me use the pronoun "she" instead of the first pronoun singular. Well "she or I" am often asked, "Did the water-rats know they were being photographed?" When I say that I had hired each boy for the sum of one penny you may know that they were conscious. How the photograph came to be taken was this. (I never venture to call a photograph a picture. My father once said to me, "How can the reflection of a gutter-percha world in a brass door-handle be a picture?" This made me ashamed of photography; have never got over it.) One hot morning I saw three naked boys shoving an old box about in the harbour. I went to them; asked them how long they were likely to be there. They said all day, if I liked; for, though they ought to be at school, the kid-catcher could not come into the water after them. I offered them one penny each to wait till I fetched the camera. My offer of wages had spread, for, when I returned, I found thirteen boys naked. When they saw me, they all stood in a row in the same position, which was a cross between a soldier at attention and the Greek slave. I have regretted that I did not take them so. I was at a loss to know what to do with so many sitters, as the box would only hold two, till I saw an empty boat at the other side of harbour. I told the boys to fetch it, got the most sensible of the lot to put the rest where I wanted them, fired off a couple of plates, and paid my sitters. It was rather amusing this part of the business, as they were at a loss to know where to put their pennies. On looking over the photographs, in hopes that they would speak to me, I am reminded of the bibulous habits



of one of my subjects, and of the stratagems he used to gratify his taste. I can quite understand any one with an income of from £120 to £400 getting jolly well drunk every day, for by so doing Income-tax harpies will never trouble him, as they would if he kept sober, and did not support our glorious constitution by disposing of such a quantity of duty-paid alcohol. But I would advise photographers to steer clear of "thirsty" subjects. The man I am thinking of will stop me in the street, when thirsty, with, "Excuse me, but you won't mind me stopping you on a matter of business?" "Oh, no!" "Then will you lend me 1d. till to-morrow." At other times he will walk into my studio and ask for the loan of 6d., explaining that he has plenty of money at home, but is in immediate want of that sum, and has not time to go home for it. No. 81, one of the old fishermen, asked me how old I thought the three of them were. I did not know. He replied, nigh on to 300 years; but I found he counted the age of his cobble as well, when speaking of the age of his partner and himself.

By the way, from a letter I had this morning, a lady in London evidently thinks I am personally conducting my show, for she writes to know if I can take her photograph at the exhibition on Friday or Saturday.

### ON THE PRINTING DENSITY OF NEGATIVES.

BY LYONEL CLARK.\*

WE then get the "dense negative"; this is one where, although exposure is correct, or erring on the "over" side, development has been carried on too far, and the high-lights have obtained the maximum blackening that the silver salt is capable of assuming. The deepest shadows will be full of detail, not fog; and there may not be even small portions of clear glass. The same result will generally be got by over-intensifying a brilliant negative.

The last kind of negative must not be confounded with a foggy negative—a condition that can obtain with any of the above types, and will alter the printing rate or rapidity of the negative by reducing the light intensity, and, therefore, indirectly affect the intensity curve of the negative; in fact, the result will be the same as printing through a coloured glass, which has the effect of hardening the negatives and giving a longer and slower curve. All who develop with dry pyro and ammonia know how thin these yellow-stained negatives may appear, and yet give most excellent and vigorous prints.

The following sets of proofs are the results obtained from my sensitometer, and on the black-board they are laid off in curves; but these curves must be more or less unintelligible to the majority, and some explanation will be necessary. I must presume some knowledge of negatives on the part of my audience, and I will, therefore, take as a basis the quality of negative that will give a good silver print. Silver-printing is, I think, the most generally practised, and most of you are, therefore, likely to know the gradations of negative that best suit this process.

Taking, then, a good silver printing negative as our standard, we will assume the number of gradations of tints from the clear shadows to the densest high-lights of our negative to be 100. Then from the mean of several experiments I find that plain paper requires eighty-three gradations.

Obernetter paper, on the other hand, requires 108 gradations; that is, that a negative suitable for plain paper should be less dense than one suitable for silver, whilst a negative for Obernetter's gel. chloride paper requires a denser negative than a silver one. It is, however, difficult to accurately gauge the results of these papers; owing to the sunken appearance of the image in plain paper, and the high transparency of the Obernetter paper, comparison is not very accurate.

Of the platinotype papers, the ordinary process requires as nearly as possible the same quality of negative as a silver print, providing the shadows are clear; if any fog be present, a very much denser negative is required; indeed, if much fog be present, it will be nearly impossible to get good results.

The Piziztype requires an exceedingly dense negative if anything like absolute black is required,—some 300 or 400 gradations.

Of Mr. Willis's new papers, or Willistype, as I will call them, the X or brilliant paper requires a negative less dense, the pro-

portion being as 80 to 100, whilst the Y or soft paper will take a negative twice as dense, that is, with 200 gradations.

Comparing, now, the developable papers, we find that Fry's argentotype requires the thinnest negative—one equal to about sixty-six gradations; the Eastman next, with seventy-seven; the Ilford rapid gives the same result as the Eastman; whilst their slow paper requires a slightly-denser negative,—one equivalent to eighty. Lastly, the Alpha gives the best result with the same negative that will give a good silver or platinum print. This latter part, however, owing to its peculiar composition, is very difficult to classify. By varying the quality of the light to which it is exposed, an endless variety of curves may be obtained, whilst variation in developer produces many more. Resuming the whole of the above, we may say that a good, fair negative will give us, without any dodging or manipulation, good prints, equally, on albumenised, plain-salted, Obernetter, platinotype, and Alpha papers. For a thin negative we should use, if very thin, argentotype, then Eastman and rapid Ilford, then the slow Ilford, and of the printing-out papers, Willis's X paper. On the other hand, for dense negatives, the only developable paper likely to give good results, without dodging, is the Alpha. Of printing-out paper, the ordinary platinotype, fully exposed and developed cold, gave good results with dense negatives, but this cold development rather comes under the head of dodging. Obernetter paper was also suitable, and for very dense negatives the Piziztype and Willis's Y paper.

As a sort of proof of my deductions, I have also prepared a series of prints from negatives, which may be classed under the heads of thin, brilliant, and very dense. The Willis X paper appears to me to give the best results with the thin one, whilst the Willis Y gives the best result with the dense ones. Of developable paper, the Ilford slow and Alpha give the best results with the brilliant negatives. But it must be clearly understood that these papers are treated mechanically, exposed, and left to develop up to maximum density, &c.

Whilst on the subject of these papers, some remarks on their relative rapidities may be useful. It is quite clear that by the system I have used in my experiments the time of exposure has no effect, the curves being simply measured from the density of deposit, and not from the time the light acted. But it was, of course, necessary for me to find out the relative rapidities, and I give them to you. We can measure the rapidity of a plate in several ways—by exposing it under a sensitometer to an equal light for equal time, and noting the last square of the sensitometer readable; or the system I prefer and have used, of exposing it to a constant light for different periods of time, and comparing the periods necessary to produce a maximum darkening of the film.

I find the following rapidities, assuming Ilford rapid as a standard, requiring ten seconds' exposure at 2' 6" from a ten-candle gaslight; then—

Eastman will require ...	...	...	...	30"
Argentotype ...	...	...	...	60"
Alpha bromide slow ...	...	...	...	240"

We now come to the question of the best kind of paper for enlarging upon. This is a question that must so much depend on the intensity and quality of the light at one's command, that it is extremely difficult to lay down any rules; but, speaking generally, it may fairly be stated that a thin negative should be used, as in London, at least, one rarely has too good light; and with artificial light, a thin negative is almost imperative if paper be the medium used to enlarge upon. If, however, a somewhat dense negative must be used, then the most rapid paper obtainable should be used—such as Ilford rapid, Eastman, or Fry.

It must of course be understood that the quality of the different papers under consideration is not touched on in these experiments; that must be a matter of individual taste.

Having done my best to settle the amount of densities which the negative should have, a few words are necessary as to the method of obtaining this amount at will. To describe this in words, I am, I confess, fairly nonplussed. Every different brand of plates gives different appearances under development. Generally speaking, it is safe to see the image well out on the back before stopping development; but, of course, watching the effect by transmitted light is the best, although difficult.

I can only recommend beginners to experiment. Let them throw away a dozen plates on a subject, giving the same exposure and same developer, but stop development at different stages, noting carefully the appearance of the image. After fixing, expose the resulting batch at one time over the particular paper

\* Continued from page 715.



they intend to use, and noting the one that gave the best results, put it aside for future reference, and always try and work up to it.

I feel assured that the time expended will not be wasted, for it is only by careful experiment that you will quickly obtain an accurate knowledge of the correct printing density of negative.

#### DISCUSSION.

Mr. FERRERO stated that he could not agree with Mr. Clark's remarks about the rapidity of the different bromide papers; he had found by careful experiment the Ilford rapid bromide at least forty times as rapid as Eastman, and fifty times as rapid as the slow. The Ilford people themselves made the same statement.

Mr. SHILTON said he could not agree with Mr. Clark's remarks about the Obernetter paper, at least, assuming, as he believed, the aristotype paper to be the same. He had found that it would give first-rate prints from negatives too thin to give silver prints. With regard to Mr. Clark's advice as to experimental negatives, he did not quite see how a fixed negative could help them to judge an unfixed one. How did Mr. Clark reconcile his statement as to the appearance of the image on the back with Mr. Chapman Jones's statement, that this appearance of the image on the back showed that the negative had then got its fullest density, and any further development must tend to destroy contrast?

Mr. CHARTERS WHITE also considered little could be judged from the appearance on the back of the plate. He, however, commended Mr. Clark's advice as to making pilot negatives.

Mr. DAVISON disagreed with Mr. Clark's curve for plain paper. Merely from observation, he thought a denser negative best suited this paper, as it appeared to give flat and sunken deposit. As regards Alpha paper, he expected even a better curve would have been graphically given to it. It seemed to suit itself to both dense, and thin flat negatives, in a most accommodating manner. It would be much more used but for the soapy appearance which the surface often presented, and but for the general opinion that its condition after any keeping could not be relied upon. Mr. Clark had raised an interesting point in his comparison of the varying effects produced by exposure for one second at F/8, as against 64 seconds at F/64. Perhaps Mr. Clark would go into the question as to why it was that a large amount of light for a short period had greater effect than a small illumination for a proportionately longer period; in other words, why intensity was more effective than time. The appearance on the back of a plate varied with different makes of plates. He did not think experimenting with the sensitometer (which was necessary for many purposes) would assist an operator in this matter. Examining by transmitted light appeared to him the most effective way to judge density. The appearance of the developed negative must vary according to subject, its lighting, and whatever effect the operator was aiming at, and this came easiest by transmitted light. He should also like some explanations about the results Mr. Clark obtained with the two new Willis papers, X and Y. He had understood from Mr. Willis that they were both intended to give brilliant results, the difference only being in the surface quality of the paper, and was, therefore, surprised at Mr. Clark's wide divergence in the results.

Mr. ELDER was interested in Mr. Clark's remarks about the different action of a weak and strong light on the sensitive film. Mr. Herbert Starnes had propounded a theory about this. Supposing the silver molecule to be enclosed in a film of gelatine, the impact of light broke this up, and released the imprisoned molecule more easily when the light was intense than when it was feeble. Without at all agreeing with Mr. Starnes' theory, he thought that a most interesting field of research was opened up in this direction; and

The CHAIRMAN, in summing up, also alluded to the difficulty of judging the density by means of the appearance of the back of the plate, and instanced two plates of different brands, one of which required all the high-lights to show through, whilst the other was dense enough without any image showing. He therefore preferred to watch development by transmitted light, and used for that purpose a light reflected up from below, using a glass developing-dish.

W. H. GREEN stated that he also used a similar apparatus in developing.

LYONEL CLARK, in replying, said that he was very sorry that his results did not agree with Mr. Ferrero's, but his had been carefully made, and he showed the sensitometer results. He ascribed the discrepancy to Mr. Ferrero's use of negatives instead of sensitometer, by which the results were made sub-

servient to the quality of the negative. As regards Mr. Shipton's results with aristotype, he quite agreed with them. Although the curve of Obernetter was fairly flat, yet thin negatives also gave good results. He thought the cause of this was the extreme transparency of the shadows, due to the gelatine, which allowed these to be over-printed without showing. A similar appearance obtained with silver paper when treated with wax, by which detail in the shadows was considerably improved. With regard to Mr. Chapman Jones's statement, it appeared correct on the face of it, but many plates, even after giving a strong appearance at the back, would fix out much thinner. It would almost appear as if a dark-coloured salt soluble in hypo was first formed, this afterwards being transformed into the metal. Mr. Davison's remark as to plain paper was perfectly correct. Owing to the mattness of the deposit it was difficult to estimate the blackness. As to Alpha paper, he really thought he had spoken sufficiently highly of it to satisfy even Mr. Davison. With regard to his remarks about the Willis paper, he had certainly understood that the papers were to give different images. They certainly did so. With regard to the manner of judging the density of negatives, he had purposely glanced over this matter, as it was fraught with the greatest difficulty, and really was only learnt by experience. He gave the means of examining the back more as a warning of the state of density than an absolute test. To obtain an accurate idea of this, nothing but experiment could accurately serve.

#### Notes.

One of the most interesting series of photographs we have received is a series showing the interior of the Plantin Museum, at Antwerp, taken a year or so ago by F. A. Bridge.

The Plantin Museum is the printing-house established in 1555 by Christopher Plantin, and for centuries it was the most renowned and important of all the Low Country printing-houses. By a series of circumstances, the account of which reads like a romance, the Plantin office has been preserved in all its completeness—a far more real memorial of past life than is the bared city of Pompeii.

The Plantin house and work place forms a square around a courtyard, something like Hampton Court Palace; and Bridge's photographs not only show the working departments, such as the press-room and type-foundry, but also several of the living-rooms with their magnificent furniture and art treasures.

Among the subjects announced by the Society of Arts for the forthcoming session, we find a lecture, on Dec. 9th, on "Standards of Light," by W. J. Dibden. It is also announced that Conrad Beck will lecture on "Construction of Photographic Lenses," but the date for this lecture is not yet fixed.

In addition to these, Captain Abney is to give a course of Cantor lectures on "Light and Colour," the dates for these lectures being November 26th, December 3rd, 10th, and 17th.

The Americans are ahead of us in most things, and we should not be surprised if some adventurous photographer on the other side of the Atlantic, before long, boldly announced that instead of retouching the negative to make his sitters beautiful for ever (that is, so long as their



photographs lasted), he put the retouching on the actual face previous to photographing. The system is both possible and easy, if we may believe Dr. John H. Woodbury, "the Great Dermatologist," to whom the *Morning Journal* of New York devotes a column, including a portrait of the professor, and views of his operating parlour and business office. "Last Tuesday," says the *Morning Journal*, "a young lady from Philadelphia called upon Dr. Woodbury. She was an actress, and no collection of professional beauties can be considered complete without her photograph."

From this we assume that the lady in question was about to be photographed, and had gone to Dr. Woodbury to be prepared. Anyway, we are told that "her shapely face was covered with freckles. Acne disfigured her pale cheeks and chin, and immediately under her left eye was a red scar one inch in length that had been caused by a fall when its owner was a child." Dr. Woodbury removed the lady's freckles, acne, and scar, enabled her to go out into the sunlight, and, we conclude, into the light of the photographic studio besides. The sooner such a treasure as Dr. Woodbury is secured by the photographic profession the better. We certainly anticipate that the time will come when photographers will advertise, say, for instance, "Plain faces made pretty; a Dermatologist kept on the premises."

M. Marey has been applying his system of photochronography, with which he has achieved such curious results in regard to the flight of birds, to fishes. His last experiment has been with eels, the silhouettes of which, produced by a strong light underneath an aquarium, he has photographed. Five photographs were taken in one-tenth of a second, and the movements during that interval of time reproduced. The details of these interesting experiments, illustrated by a diagram showing the successive movements, will be found in *Comptes Rendus* for October.

The same authority states that a letter has been received by the Academy from M. Janssen, stating that he has just made an ascent of Mount Blanc with the object of studying the phenomena of absorption produced by the oxygen of the terrestrial atmosphere. In spite of considerable difficulties, M. Janssen reached the *Grands Mulets* and passed three days there. The observations have been made under the best conditions, and M. Janssen purposes communicating the results to the Academy on his return. These observations have been obtained by means of photographs taken at different periods of the day. M. Janssen has long been of opinion that such photographs would be of great assistance to the science of meteorology, and it is to be hoped that his results will equal his expectations.

If an amateur once takes up photography earnestly, he talks of nothing and thinks of nothing else—at least, during the early days of his mania. The French are quick to perceive the absurd features of a craze, and accordingly we have *Le Temps* gravely burlesquing the photographic rage. Its vein of caricature runs in this

way:—"My friend, Lande," says a supposed contributor, "is a scholar, an affectionate parent, a good citizen, but when photography is in question, every feeling is in abeyance, and he has a soul only for bromide plates and instantaneous lenses. The other day he said, 'I was going towards the Salpetriere Hospital, and passing the horse market I heard some horrible screaming. I looked, and saw a man chasing a woman with a long knife in his hand. Fancy my despair—!' 'Ah!' I returned, 'because you could not run to her. I understand.' He scarcely noticed my interruption, and went on, 'I had no plate ready in my plate-holder. I shall never have such an opportunity again.'"

For producing statements based upon imagination there is nothing like your London correspondent. His latest concoction is that Baldwin is none other than "Lulu," who used to allow himself to be shot out of a cannon at various places of public entertainment. It is not often that so many errors are crowded into so few words. In the first place, Lulu was never shot out of a cannon, the questionable honour belonging to Miss Zazell; and in the next, Lulu is a highly respectable photographer in America, and a member of the Photographic Society of Great Britain. Lulu, or Mr. Farini, is so daring a photographer—witness his feats described in "Through South Africa with a Camera," by G. A. Farini—that had he been Baldwin, he most assuredly would have taken a photograph of the crowd as he descended in his parachute. According to the *Scientific American*, at the time when Baldwin was arranging for his first descent, a Mr. Farini—Lulu, we presume—was taking photographs by what the Americans elegantly term "bug light." In other words, he was trying photographic experiments with the light of luminous beetles, and had succeeded in getting a print from a negative by this means.

The *Court Journal* corroborates our opinion expressed last week, as to the irresistible desire which seizes people to plant themselves in front of a camera directly they see it stuck up in the street or field. Our contemporary says:—"The anxiety of all mankind to be painted or photographed is passing wonderful. We have seen a man gravely take up a pose at the top of the Bowdstone, in Borrowdale, the moment he beheld a lens levelled at that object. In a quarter plate he would have been an object of the size of a pin's head, and the chances were altogether against his seeing the photographer again during his lifetime." This is very true. The singular thing is, that while persons are ready enough to be photographed in the open, sometimes no power on earth can drag them to the studio. Why is this?

The significant use which Mr. Gladstone, at Birmingham, made of the photographs of Mitchelstown is likely to be imitated. We should not be surprised if some advanced member of the Home Rule party went a little further, and had enlarged photographs exhibited on the platform, so that all in the room would see them. We do not quite understand the objection which the *Times* takes to the



Mitchelstown photographs. It remarks that Mr. Gladstone insulted the general intelligence by producing photographs which he cannot prove. But what is meant by "proving" a photograph? A photograph carries with it its own evidence. Is it possible the *Times* can imagine that the Home Rulers set up a Mitchelstown to suit their case, and had it photographed?

It is not wonderful that the police have pathetically besought the newspapers to refrain from publishing any portraits or descriptions of the supposed perpetrator of the Whitechapel murders. To evolve a portrait of a murderer from the recesses of the editorial sanctum is a development of modern journalism which we can well do without.

The Sea Serpent which appeared so opportunely the other week is, if we may venture to apply such a term to it, a very knowing "Saurian." How it came to learn that Parliament was to have a Winter Session this year we cannot tell, but it certainly would seem that this marine monster got to know in some way that the "silly season" was about to be prematurely ended by the re-opening of the Legislature, and accordingly made up its mind—or perhaps, seeing of what the monster consists, we should say made up its tail—to appear forthwith, whilst there was yet a chance of its advent being duly announced. Yes, our mysterious old marine friend is evidently what an Irishman might call "a downy bird," and when, indeed, we compare its marked acuteness with the persistent dullness and lack of enterprise of the ancient mariners to whom it is so frequently appearing, the comparison is all in favour of our submarine visitor. For it will have been noticed that the minute description given once more of last week's Sea Serpent is founded on recollection merely. Not one out of all those who assert that they witnessed its re-appearance thought of bringing a camera to bear on the monster of mystery, and of thus securing at a snap evidence worth scores of columns of oral description.

Of course, it may be said there was no camera on board the schooner; then all we can reply is, that there ought to have been one. Ships should no more think of sailing without a photographic apparatus on board than they would of starting minus a sextant or a binnacle! Why, it would be worth while for the captain to invest in a camera on his own account, if only on the chance of meeting the Sea Serpent or "The Flying Dutchman" on his voyage. Why, the fortune of the skipper who succeeds in bringing home a negative of either of these wonders of the deep would be assured. Only fancy what a run there would be on *cartes* of "Leviathan at Play," or cabinets of "Captain Vanderdecken" (plain and coloured) as seen on his own poop deck! Once photograph the Sea Serpent, and we should be literally "seeing snakes," and little else, whilst the *furor* lasted. If, however, those who go down to the sea in ships persist in being satisfied with having a mere look at what the provincial reporter, we notice, calls "the Anak-like denizen of the vasty deep," and refuse to be prepared for its next appearance by

adding a photographic apparatus to the ship's stores, they must not be surprised if the public scornfully laugh at the sensational details they furnish, and regard the saurian's interminable tail, of which so much is made, as one only worthy to be catalogued with those "told to the marines!"

#### PRINTING-OUT PLATINOTYPE, AND A COMPARISON OF PLATINOTYPE PROCESSES.

BY F. DE PAULA CEMBRANO.\*

Now we pass on to No. 3 formula, which is the one Pizzighelli recommends.

The thickening substance, gum-arabic, is added direct to the sensitizing solution.

The following is the way in which prints No. 20 (which I passed on a little while ago) were prepared:—

B	{ 3 per cent. sodium oxalate ... ..	8 drachms
	{ Sodium-ferric-oxalate ... ..	3 "
	{ Gum-arabic ... ..	2 "
C	{ Solution B ... ..	2 "
	{ 5 per cent. chlorate of potassium ... ..	10 minims

To sensitize 1 sheet 26 × 20 ...	{ B = 90	"
	{ C = 30	"
	{ A = 2 drachms	

To prepare B, warm the sodium oxalate and dissolve in it the ferric oxalate; then add the whole to the gum, which has been previously well pulverised. Stir well, and allow to stand for some hours in order to get every particle of the gum thoroughly dissolved. Strain through cloth.

If the gum is not all dissolved and the liquid not strained, you will get these ugly patches, as shown in prints No. 1.

Now, with regard to sensitiveness, I must say that the printing-out paper is far behind the two other processes. In fact, it is dreadfully slow; but let us hope that means will be discovered to bring it up to the same rapidity as the ordinary platinotype process. I cannot well tell you how much slower it is, so much depending on the light, preparation, and hygroscopic condition of the paper. I will estimate it, very roughly, at from ten to twenty times slower. Here I may add that every print shown to-night (except in one or two instances) was done in a diffused north light.

With a desire to shorten the time of printing, I have tried adding various substances to the sensitizer, and have also used other substrata than gum and arrowroot. In both cases I have had, as yet, but little time to make many experiments.

Sizing the paper with gelatine or albumen has not satisfied me; but I have obtained very fair prints, with a slight increase of sensitiveness, by adding chloride of calcium to the sensitizer.

The series marked 19 was so prepared. While printing, the image has a dark bluish colour, which, on fixing, becomes a good black, as you see. These are among the best, if not the best prints that I have been able to obtain in the printing-out process, and I think that you will agree that the difference between them and those done by the hot-bath process is slight, and requires close comparison to discover it.

The sensitizing solution was prepared in the same way as in the first formula given you to-night, when showing prints No. 13, with the addition of grains calcium chloride in 40 minims of distilled water per sheet of paper.

The next series, No. 21, were prepared in the same way, substituting for the calcium chloride solution three drops of a saturated solution of sulphate of iron, and nine drops of a saturated solution of oxalate of potassium. This addition was suggested to me by Mr. J. B. B. Wellington. There was hardly any increase in sensitiveness, but the colour is as good, though the image may be a trifle harder.

The following experiment has given also fairly good results:—No calcium chloride or ferrous oxalate developer was employed; but, instead of taking 140 minims of the C solution, I only had 90, and made up the rest with solutions A and B, as supplied by the Platinotype Company for their hot-bath process. (See print No. 22.)

Being curious to know what would be the effect of sensitizing a sheet of paper as for the hot-bath process, but with the addi-



tion of the developing agent, I printed Series 9 and 12. They look very fine, but I must tell you that they had to be developed hot, as they would not print out.

Almost all my experiments were confined to the black tones, but here are a few sepia prints, which were made according to Pizzighelli's instructions.

In conclusion, let me assure you, gentlemen, that I have tried each process in the fairest and most impartial way, my only object being to find out what could be done with each, and which was the best. I have tried, to the best of my ability, to show you the working and the capabilities of each. Let each one make his choice, and, whatever this be, I feel sure he will never repent, for a platinotype print will be to him a thing of beauty and a joy for ever.

#### DISCUSSION.

In the discussion, Mr. WELLINGTON said he had experimented upon the No. 3 formula, as given by Pizzighelli, making variations in it. The conclusion he had arrived at was that the best results were obtained when he used sugar to the gum used in preparing the paper. Some excellent examples of this method of preparation were shown. He was glad to see that Mr. Cembrano had shown good prints upon paper prepared with chloride of calcium in the sensitizer. It had occurred to him that a hygroscopic substance mixed in the sensitizer might prove beneficial.

Mr. GUARDIA thought gum gave a granular appearance. He preferred sized paper. He did not think the printing-out paper often gave the results of the old process; in fact, he inclined to think no process did.

Mr. STROH could never get Pizzighelli paper twice alike. One lot would give excellent results, the next batch streaky, and not at all black. If different kinds were manufactured, then they ought to be distinguished by the vendors, as A, B, and so on. If it could be made perfect, it would be a lovely process. He had found it rather useful for panorama subjects, where the printing of the separate sections of the picture had to be of the same depth. Contrary to what was generally stated, he pointed out that the paper did really print, although perfectly dry. The colour given was different from where it had absorbed moisture. Several examples were shown by Mr. Stroh to illustrate his remarks.

Mr. COWAN found he obtained a very vigorous print with the commercial paper.

Mr. LYONEL CLARK said that he had been experimenting with the Pizzighelli printing-out platinotype, or, as he proposed to call it for short, "Pizzitype." He had coated some paper himself, obtaining the materials from the Platinotype Company, and had found no difficulty whatever in the operation. But he intended to confine his remarks that evening entirely to the commercial paper as found in the English market. He might as well at once state that his results were unfavourable to the new paper, which he considered were only manageable when used with extremely dense negatives; or, what was the converse of this, when flat, low-toned prints were required. He had compared the working of this paper alongside of the ordinary platinotype, and the new cold bath process of Mr. Willis's, which, following the example set above, he would call "Willistype." Although he had made comparative experiments with various negatives, he did not attach much importance to results so obtained, as it was difficult to separate the negative from the character of print that best suited it, and, therefore, one might quite misjudge the value of the printing process *per se*. Some negatives required a soft print, and would give better results with a process having this peculiarity, than with one that gave a hard print, although the latter was undoubtedly the best process on the whole. *Ceteris paribus*, one might say that the best printing process is the one that will give the best result from the thinnest negative, for although there might be a difficulty in getting density, there was rarely one in the opposite direction. He had, therefore, made a series of experiments on these papers, using both an ordinary sensitometer; he had also exposed the papers together to the same light for varying periods. This manner permitted of laying out the result in curves. Taking the ordinary platinotype, the curve varied with the temperature of the developing bath. At a temperature of 180° F., it gave nine gradations; at 140° F., 10; at 120° F., 12; at 100° F., 14; and when quite cold, that is at about 50° F., as many as 18. In common parlance, this meant that the same results could be obtained with the cold bath as from a negative having twice the density of one used with the hot process. By density he meant range of tones between clear glass and densest deposit. As for the Pizzitype, he had used it in every imagin-

able way; keeping it always in a calcium tube, breathing on it, steaming it, leaving it all night in a damp room or damp box, developing it with soda, hot and cold oxalate of potash, leaving it to develop itself in the dark. But all these methods gave but very slightly different results, depending wholly on the state of the paper when exposed. If exposed wet or on a damp day, it darkened equally; but if exposed dry or on a dry day, it turned of a yellowy orange first, this colour gradually changing to black in the presence of moisture, which in this case might be taken up after removal from the printing-frame. He was surprised to notice that developers, such as carbonate of soda and oxalate of potash, had no action other than that due to moisture on the paper, and could not understand it. But do what he would it was impossible to get a good juicy black without perfectly abnormal exposures, such as two days in bright light; in fact, in one experiment, where he had obstinately continued exposure till the paper did give a respectable black, he found that the ordinary platinotype exposed alongside of it had also blackened (without being developed) to a fair extent. So he was bound to conclude that the paper, as commercially sold, was quite useless where brilliant prints were required. Only with negatives of most abnormal density could fair results be obtained, and even these would be given on ordinary platinotype by using a cold bath. He would further like to make a few remarks on the new Willistype. He had only lately received some of the paper from Mr. Willis, and, therefore, his experiments were not very reliable; but, as far as he had gone, he was very much struck with the brilliancy of the paper (he showed some results from thinnish negatives in support of this statement). Its curve was the shortest and sharpest of the lot, which indicated its capability of giving brilliant results from thin, flat negatives. Mr. Clark roughly sketched on the blackboard the form of the different curves given by the above-mentioned processes.

Mr. RODGERS had obtained good results with thin negatives, and had found much advantage accrue from the use of old acid baths. There was more detail in the shadows, he considered, than with the hot process.

Mr. DAVISON was afraid a velvety-black could never be obtained upon the printing-out paper. He had found it give good prints from thin negatives if the paper were dry and new, although the colour was black. It could only be allowable to breathe on the paper for printing from very hard negatives. He showed some examples of solarization on the paper, where a burnt-up appearance was the result. He had not found, as stated, that there was any reduction of the density of the negatives where "breathed-on" paper had been in long contact with the film. Of all the processes he had tried, he preferred the new cold-bath process. The image was on the surface of the paper instead of being sunk in the paper, and, consequently, greater brilliancy and detail were given. There was very little difficulty in judging the printing, which was quicker. The point he felt of the most importance was that a brilliant and a half-toned paper could be supplied, one suited to thin and the other to denser negatives. The developer should not be too dilute, or granularity appeared to result. The great objection, he felt, which would be raised against the process was the cost, unless some means could be devised of economising in the use of the developer.

Mr. WILLIS said he rather preferred to listen to the opinions of others in regard to any new process, than to express his own. He might say that wherever the image was printed-out in the old platinum process (the hot process), the result was inferior to that in which it was developed out. Further, after printing to a certain depth, the platinum deposit was so opaque in printing-out methods that the action of light in the shadows soon ceased. In regard to printing-in clouds in platinum, he gave the experience of a good worker that it was best to print the clouds in before the landscape, as there was the less risk of fogging the horizon line. Referring to the cold-bath process, he stated that warmer tones could be obtained by exposing for half an hour to the atmosphere.

Mr. CEMBRANO having replied, the Chairman closed the discussion, and a very hearty vote of thanks was passed to Mr. Cembrano for his careful and complete paper, and series of experiments.

In illustration of the subject of the evening, an interesting set of pictures by SEYTON SCOTT was shown, in which all the processes were well compared, and the variation in colour obtainable on Pizzighelli paper exemplified. Some fine prints lent by Mr. Rudowski were also exhibited.



## PHOTO-MECHANICAL PRINTING.\*

## ARTICLE II.—THE PROCESS MEISENBACH.

BY D. WINSTANLEY.

I HAVE before me now about a couple of score of prints by the photo-mechanical process Meisenbach, one of the Meisenbach plates, just as it was received from the makers of it, and several descriptions of what is said to be the "Process Meisenbach." I propose now to briefly re-describe the process, and then to criticise it and its results in the new light I have thrown upon the subject of photo-mechanical printing in my former article (p. 482).

This is the process as described on p. 29 of Mr. Burton's book on "Photographic and Photo-Mechanical Printing," and on p. 514 of "Wilson's Quarter Century of Photography."

"A transparent plate is hatched or stippled in parallel lines. A transparent positive is made of the object (which it is desired to depict—B). The two plates are joined, preferably face to face, and from the combined plates a definite negative is photographed in the ordinary way. In order to cross-hatch and break the lines of the shading, the hatched or stippled plate may be shifted once or more (or twice—Wilson) during the production of the (said definite—Burton) negative. This negative is transferred in the usual manner to form a typographic block."—(Burton.)

"The photographic negative thus obtained may be either applied direct to a zinc plate, or a lithographic transfer may first be made in the usual manner, and the plate subsequently bitten by acid to form a block in relief. Considerable importance is attached to the shifting of the hatched or stippled plate, this being the part of the process which is especially sought to be protected by the patent."—(Wilson.)

The process is also thus described by Herr Herman Gunther on p. 99 of the present volume of the News:—"In the Meisenbach process, the part which is especially sought to be protected by the patent is the production and use of the lined transparent glass screen, which has for its purpose to break up the half-tones of the photographic image. This is effected in about the following manner:—A white screen of large dimensions, provided with a series of parallel lines, is photographed, and hereby as much reduced that on the resulting negative the lines are very close together. A negative is now made of the object, the lined negative being placed between the object and the negative, at first, so that the parallel lines are in a vertical direction to the axis of the lens; then it is shifted once during exposure, so that the lines are now in a horizontal direction to the former ones. By this way an intersection of lines is obtained, and the photographic half tones are broken up. The negative thus obtained is transferred in usual manner to a zinc plate, and subsequently etched by acid to form a block in relief."

Herr Gunther, having thus described the process Meisenbach, proceeds to consider that supposed to be employed by Messrs. Angerer and Goschl, of Vienna, which does not differ materially from that of Meisenbach. In this latter description, however, he makes the following very important remark, which clearly applies as much to the one process as to the other. In alluding to the cross-lined screen, he says, "*It is important that the transparent lines on it representing the black lines of the reproduced screen are narrower than the opaque lines forming the intermediate spaces.*"—He also states that "the lined plate should have at most six black lines to a millimetre,"—i.e., 150 to the inch—as "otherwise it would be difficult to transfer the image to the zinc plate, and to etch it, and also in printing the finished block many difficulties would be met with. It is, therefore, better," he continues, "to use a cross-lined negative with only four or five lines to the millimetre"—i.e., 100 to 125 to the inch—and this, he

says, "may be placed before the sensitive plate at a distance of one and a half to two millimetres"—i.e., not "joined," but with an interval between of from one-seventeenth to one-twelfth of an inch.

So much for my quotations.

It will be seen that these descriptions of the process do not exactly coincide. Messrs. Burton and Wilson agree that the lines should be "hatched or stippled," whilst Herr Gunther says they should be "provided." Probably they all three mean they should be ruled. "Hatched or stippled" lines would, I apprehend, be discontinuous, and present one of the appearances here subjoined:—

Herr Gunther lays stress upon it, and most properly, that the transparent lines on the negative should be narrower than the opaque lines forming the intermediate spaces. They should not only be narrower, but they should be much narrower, and here is the reason why. The size of each aperture in the grained screen—or in the network screen, as it would be more correct to call it—directly determines the size of the smallest dots seen in the ultimate print obtained, which dots are of the same magnitude as the apertures of the net, and constitute the lightest kind of shading. Were the black lines which separate the apertures or spaces of the same width of those spaces only, clearly the largest dots producible by the divergence of the rays of light would have but twice the diameter and four times the area of the smallest, as when they had reached this size coalescence would take place, and the shading would become a continuous mass.

This fact is rendered evident in fig. 1, in which the thick



Fig. 1.

horizontal lines represent the opaque parts of the network, and the lines which pass between them at various angles, the diverging rays of light which produce the dots differing in magnitude according to the different depths to which they penetrate.

It is of no consequence at what angle this divergence may take place so far as our present consideration is concerned, nor how that divergence may be effected or controlled; the fact remains that the largest dots will have only twice the diameter and four times the area of the smallest, if the lines of clearness and the lines of blackness in our network are of a common width, and the effect will be that if there are in it any areas of black at all larger than a single dot, the whole picture will be heavy and overcast as with a cloud, excepting where a few pure high-lights disport themselves sporadically amidst the general gloom. This defect exists, to a greater or less extent, in many photo-mechanical prints which are now before me, and amongst them are some of the earlier examples of the process Meisenbach. The remedy is obvious. It is to broaden the opaque lines of the network granulator, as depicted in the final negative, or rather to increase the proportion which their breadth bears to that of the spaces which intervene between, and thus bring the intercepting screen nearer to the optical centres, from which, for theoretical purposes, the diverging rays may be supposed to spread.

(To be continued.)



## Patent Intelligence.

### Applications for Letters Patent.

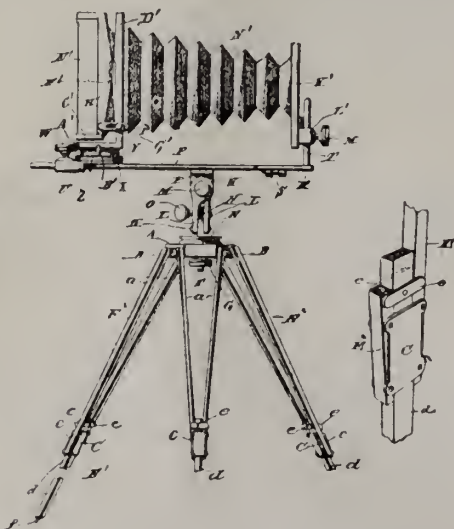
- 15,901. CHARLES TOMLINSON, 1, St. James' Square, Manchester, for "Improvements in and in the Manufacture of Photographic Printing Frames."—November 3rd, 1888.
- 15,936. JOSEPH WILLIAM ZAEHNSDORF, 166, Fleet Street, London, for "A Novel Means or Method of Preparing Photographic and other Pictured Cards or Mounts for Connecting them in Book-like Formation, also in Covers for the Purpose."—November 3rd, 1888.
- 15,984. DANIEL GRANT, 166, Fleet Street, London, for "Improved means of Producing Copies of Photographic Pictures in Colours."—Nov. 5, 1888.
- 16,108. JOSEPH MONTEITH, 62, St. Vincent Street, Glasgow, for "Improvements in Adapting Balloons for Photographic Purposes."—November 7th, 1888.

### Patents Granted in America.

- 592,003. JAMES E. BLACKMORE, Grand Rapids, Mich., "Photographic Camera."—Filed April 25th, 1888. Serial No. 271,767 (No model.)

*Claim.*—1. The combination of the parallel bars *a*, the plates *c*, connecting their lower ends and arranged on opposite sides of the bars, the longitudinally-movable bars *d*, arranged between the bars *a* and the transverse plates *e*, secured to the upper ends of bars *d* and bearing on opposite sides of bars *a*, substantially as described.

2. The combination of the tripod-cap, the plate *E* centrally pivoted thereon and revoluble in a horizontal plane, the clamping-arms *L* pivoted to the plate *E* and adapted to swing in a vertical



plane, and the camera-supporting bar having the depending plate *K* pivoted to the upper ends of clamping-bars *L*, and adapted to swing in a plane at right angles to the path of said bars, substantially as described.

3. The combination of the tripod-cap, the plate *E* pivoted thereon and having the vertical plate *H* on its upper side, the arms *L*, having their lower ends pivoted to the centre of plate *H*, and provided with the screw *O* to clamp them to said plate, the camera-supporting bar, and the plate *I* secured under the same and having the depending plate *K*, the latter being clamped between the upper ends of the clamping-arms, and adapted to turn in a plane at right angles to the path of said clamping-arms, substantially as described.

4. The combination of the supporting-bar *P*, having the rod *T* at one end, the clip *U* clamped to the opposite end of said bar and adjustable longitudinally thereon, the arms *D'*, supported and carried by the said clip, the holder *E'*, hinged to the said arms, the holder *K'*, attached to and vertically adjustable on the rods *T*, and the bellows connecting the holders *E'* and *K'*, substantially as described.

5. In a camera, the combination of the supporting-bar, the clip adjustable longitudinally thereon, the plate *X* arranged on the clip, the plate *A'* centrally pivoted on plate *X*, the arms *D'* supported on plate *A'*, and the holder *E'* hinged or flexibly connected to the said arms, substantially as described.

6. The combination of the plate *E*, the arms *L* pivoted to said plate and adapted to swing in a vertical plane, and the camera-supporting bar having the depending plate *K* pivoted to the arms *L*, and adapted to swing in a plane at right angles to the path of said arms, substantially as described.

## Correspondence.

### THE PLATINOTYPE PROCESS.

SIR,—In your note in yesterday's issue commenting on the Hastings and St. Leonards Photographic Society, I am credited with mentioning the name of "Captain Abney, who invented the Platinotype process." What I actually said was, "Captain Abney and the inventor of the Platinotype process."—Yours faithfully, WILSON NOBLE.  
45, Warrior Square, St. Leonards-on-Sea, Nov. 10th, 1888.

### DELETERIOUS MOUNTS.

SIR,—Now, that Mr. Foxlee has brought under the notice of the Photographic Club a simple but efficient test of suitability of mounts for silver prints, and the method has been further published in the journals, it is to be hoped that all who have suffered from the destructive character of the material recently introduced into the market will avail themselves of this gentleman's suggestions, and mutually join hands to prevent the recurrence of the nuisance. This can be done by combination, but hardly otherwise. The loss of a few pounds worth of defective mounts may not at first sight appear a very grave matter, especially in the conduct of a large business, and many may prefer submitting to it quietly than starting actions at law with some uncertainty as to the possible consequences. But, sir, the direct loss is in no sense a full measure of the inconvenience one has to submit to, and the larger the business the more do these become magnified. Photographers have often times supplied clients with large numbers of specimens affixed to mounts which will inevitably bring about speedy destruction, long before it is suspected there is anything the matter, and I have known instances where the first intimation of something wrong arrived with a package of returned prints in a dejected condition as to stability.

The mainstay of a photographic business, it must be admitted, is the connection which has been built up by the perseverance of an individual; and it generally happens that this connection is composed of a number of smaller circles more or less intimately acquainted with each other; therefore, what novelty, or finish, or other speciality about a photograph which may have been introduced into the business, some examples are certain to be found in the circles referred to. If they be of a fairly permanent and satisfactory character, so much the better for the producer. If they rapidly deteriorate, then what, it may be asked, is likely to become of the photographer's means of livelihood, for the damage to his reputation cannot be estimated, and he, the chief sufferer, is not directly responsible therefor. I notice that in recent evidence the legal men tried to attach the blame of fading to careless preparation of the prints. It was also stated that starch paste was not a suitable mounting medium to use, and sundry other excuses which it might be tedious to disclaim, in the face of a sharp cross-examination of a witness unaccustomed to bluster. Not many months ago, the writer was personally acquainted with a firm victimised by a smart mount of German manufacture. In reply to the repeated complaints and threats, the agents who supplied the goods contended that some



other mountant than fresh starch had been used (which was not the case); that similar samples treated with starch were blameless, &c. Suffice it to say, that a very substantial reduction was made in the account to settle the account without litigation. The matter of faulty mounts was several times discussed at the London and Provincial meetings last year, and the opinions there expressed showed that up to that time many honest traders had been supplied with goods which were unfit for the purpose for which they were purchased.

The question is of great importance, and must sooner or later be fought out; but no one individual ought to bear the brunt of the battle. Perhaps the Photographic Club or the London and Provincial Association may contemplate organising a special committee to report on the matter. Failing this, may we not form a new society to protect the fraternity against the deleterious rubbish polished up and distributed all over the land?—Yours faithfully,

November 12th, 1888.

W. M. ASHMAN.

## Proceedings of Societies.

### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE opening meeting of the winter session of this Society took place last Tuesday evening, the 13th inst., the President, J. GLAISHER, F.R.S., in the chair.

A paper was read by Captain W. de W. Abney, on "The Measurement of the Sensitiveness of Silver Salts to the Various Parts of the Spectrum;" in the course of which Captain ABNEY said that he had himself previously made quantitative measurements of the sensitiveness of plates both in the dyed and in the undyed condition, but the method he had formerly employed was not so accurate as that which he now used, and which would be described in the paper. He now adopted what might be called the magic lantern method. The amount of deposit upon any part of a plate was estimated by that part being placed in the focus of a projecting lens, and being strongly illuminated its image was thrown upon a white screen. A beam of light proceeding from the same source as that which illuminated the negative was also thrown by a reflector upon the same part of the screen. A wire was then placed at such short distance from the screen that the two shadows of it caused by the two lights should lie side by side. The beam of light which has not traversed the negative was then reduced by means of a disc consisting of open and closed sectors, and kept in rapid revolution by an electro-motor. The sectors were then closed until the lights transmitted appeared exactly to equal (judging by the shadows of the wire) that which had been transmitted by the negative. Reading off the amount to which the sectors had been closed enabled the operator to note the amount of transparency or deposit upon the part of the negative under examination. Experiments had been made with the sun as a source of light, with the light proceeding from the positive pole of an electric arc, and with gas flame. On the whole, the gas spectrum was to be preferred, as, being continuous, the comparison of a given part was more easily made. The character, however, of the spectrum of the positive pole of the electric light was identical with that of sunlight when pure—as, for instance, on a fine day in May towards noon—and was very constant, proceeding as it did from carbon at the point of volatilization. In the first place he had found, as a result of his experiments, that the curve of density of a photographic plate was not at all coincident with the curve of sensitiveness. These curves would be in the same part of the spectrum, but the curve of sensitiveness would stand much higher on the scale than that indicated by the density of the photographic deposit. In the next place he found that the maximum of sensitiveness of a bromo-iodide gelatine plate, containing 3.5 per cent. of iodide, was in the blue-green, and nearer to line F than to G. Another deduction at which he had arrived was that time exposure was strictly equivalent to exposure to more intense light—that is to say, that an exposure of two seconds to a given light gave the same result precisely as an exposure of one second to a light of double the intensity. An intermittency of exposure, he had found, did not affect its value. It had been stated that an exposure of (say) five seconds, followed after an interval by another five seconds, would produce more photographic effect

than an exposure of ten seconds straight off. He found that this was not the case. The effect of erythrosine upon chloride, bromide, and bromo-iodide of silver, he had found, was to produce a curve of sensitiveness almost identical in all. For copying subjects consisting of yellow and green, erythrosin would suffice, but if there was red and orange as well, it was necessary to use cyanine, in addition to erythrosin, and this addition, to produce the best effect, must be made not by employing the cyanine in the same solution as the erythrosin, but as a separate bath afterwards. The paper was illustrated by numerous diagrams thrown upon the screen, and at its conclusion, after a vote of thanks was passed, it was resolved that the discussion should be taken at the meeting in December, and be opened by J. Spiller.

Lieut. Mantelle, R.E., was elected a member of the Society, and after a feeling reference by the President to the loss the Society had sustained in the person of its Hon. Secretary, F. Donkin, and the reading of a letter from his brother in reply to a vote of condolence that had been passed at a previous meeting, the proceedings concluded.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE ordinary weekly meeting held on the 8th inst. was devoted to lantern matters.

A large number of transparencies were exhibited and projected on the screen by the optical lantern. Among these was a very fine series of pictures of the Norfolk Broads, sent for exhibition by Mr. Coe, of Norwich. The negatives from which these transparencies had been made were taken by T. P. Langton.

J. B. B. Wellington, C. H. Cooke, F. A. Bridge, J. Freshwater, and L. Medland also exhibited slides, principally on collodio-bromide and platino-bromide plates.

The annual dinner was announced to take place on the 29th inst., at Mason's Hall Tavern.

### NOTTINGHAMSHIRE AMATEUR PHOTOGRAPHIC ASSOCIATION.

LAST Monday night, the 12th inst., at their rooms, Cavendish Chambers, Market Street, the Nottinghamshire Amateur Photographic Association entertained as visitors the members of the Derby Photographic Association, and a very pleasant evening was passed.

### CAMERA CLUB.

ON Thursday, November 8th, Lake Price delivered an address on the subject of "Art Culture in Photography," E. R. Shipton occupying the chair. The lecturer treated of linear composition and light and shade, and specially emphasised the necessity, above and beyond ordinary art rules, of infusing mind and sentiment into all art work. To illustrate his remarks, he analysed the construction of some well-known works by old and modern masters. In regard to figure genre, there was no subject of the quiet kind which he found he could not put completely and effectively before the camera, and he would stimulate those present to organise a school for study and practice in this branch of photographic art. It was the one most open to the camera. He thought that, as a work of art, the photographic landscape did not exist, but in all classes of figure-subjects, whether classic, romantic, or rustic, there was great scope, if suitable materials, and simply a room with bare walls and floor, were given. The electric light, diffused and softened by ground-glass screens, could be used for evening work. Such a work had never been undertaken in any of the art capitals of Europe, and the results, he was convinced, would be a surprise to many.

On Thursday, November 22nd, a discussion on "Orthochromatic Photography" will be opened by W. Bedford. Meeting at 8.

### NORTH LONDON PHOTOGRAPHIC SOCIETY.

THE annual general meeting was held on Tuesday, November 6, J. TRAILL TAYLOR in the chair.

THE HON. SECRETARY read the second annual report of the Society:—"The officers of the North London Photographic Society, in presenting their annual report, congratulate the members upon the continued success which has during the past year attended its proceedings. The interest in the meetings has been well sustained, and the attendance has been very satisfactory. Short lectures or demonstrations have been given on the following subjects:—'The Platinotype Process,' by F. W. Cox, with demonstration; 'Photo-micrography,' by Dr. T. Charters White,



with demonstration: 'Toning and Fixing,' by A. Mackie; 'In Northern Latitudes with the Camera,' with lantern illustrations, by L. Medland; 'Hypo Eliminators,' by F. W. Hart, with demonstration; 'Transferotype,' by W. Bishop, with demonstration; 'The Early History of Photography on Glass,' by E. Clifton; 'Intensification,' by the President; 'Bromide Enlarging,' by H. M. Smith, with demonstration. The capabilities of single lenses, and the mounting and finishing of photographic prints, have also furnished matter for long and profitable discussions, while hardly any branch of photography has escaped notice during the year. Special mention must be made of the exhibitions of detective cameras, of rapid shutters, and of camera stands, which in each case resulted in, perhaps, the largest and most varied display of apparatus ever brought together for a single evening. Owing to the extremely unfavourable weather which has prevailed during the past summer the outdoor meetings have been but thinly attended; nevertheless, more and better work has been done on these occasions than could have been reasonably expected. The interest in lantern matters has not fallen off, the purchase of two large oxygen bottles enabling the curator to keep the Society's lantern in constant readiness, while the production of transparencies has been a matter of frequent discussion. Early in the year the Society sustained a severe loss by the resignation of Mr. H. M. Smith, who had held the office of hon. secretary since its foundation. As a slight mark of recognition of his past services, and of the esteem in which he was held by all the members, a handsome silver-mounted spirit stand was purchased by subscription, and presented to Mr. Smith on his departure from London. The Council regret that they have as yet been unable to find a successor to Mr. Smith as hon. secretary, and the duties have, therefore, temporarily devolved upon the vice-presidents. The council desire to call attention to the fact that the obligation of providing subject-matter for and of taking part in the discussions rests equally upon every member. It is to be regretted that the diffidence of some of the members prevents them from actively participating in the proceedings, even to the extent of asking questions upon subjects on which they may personally wish for information, and which would in most cases elicit replies of general interest. In conclusion, the thanks of the council are tendered to those members and visitors who have read papers or in any way contributed to the success of the meetings. Thanks are also due to the photographic press, absent members as well as the general public being enabled by the published reports to follow the proceedings of the Society."

The balance-sheet for the past year was then read by A. Mackie, showing a total of £38 18s. 3d. received during the twelve months, and an expenditure of £25 8s. 3d., thus leaving a balance in hand of £13 10s., besides sundry properties in the shape of apparatus and books valued at the present time at £14 10s.

The following gentlemen were chosen as office-bearers for the coming year:—

*President*—J. Traill Taylor.

*Vice-Presidents*—Alexander Mackie and Edgar Clifton.

*Council*—W. Bishop, A. C. Cossol, and W. T. Coventon, Rev. E. Healy, Messrs. J. Jackson, L. Medland, J. Oakley, and F. G. Reader.

*Curator*—Walter Few.

*Hon. Secretary and Treasurer*—N. P. Fox, 2, Princess Terrace Primrose Hill, N.W.

During the counting of the votes a short discussion on removing stains from bromide opals was initiated by W. Bishop, and aroused considerable interest.

After the formal business of the annual meeting was concluded, the subject of "Home Portraiture" was brought forward.

Mr. MACKIE said with the advent of gelatine plates the necessity for an expensive portrait lens had disappeared, the ordinary rapid landscape lenses giving better definition and sufficient rapidity. Care should be taken not to use a lens of short focus in relation to the size of the plate, else distortion would be present. It was necessary that the operator should see that the lighting of the model was correct before exposure, as it was useless to attempt to obtain a different effect in the negative from that which existed in nature. In portrait work it was necessary for the operator to concentrate his thoughts on his sitter, and not think about plates or developer.

The PRESIDENT described a portable or folding studio for the garden, made like a clothes' horse, which, he said, was very useful in fair weather. Excellent effects could be got in a room by

placing the sitter facing the window, the camera being outside. Where this was not practicable the sitter could be placed facing a mirror fixed between two windows and the reflection photographed; the double reflection of the mirror surfaces could not be detected in the negative.

W. BEDFORD supported Mr. Mackie's recommendation of relatively long-focus lenses. There was much temptation to use short-focus lenses for portraiture in confined positions, but distortion invariably resulted.

JOHN JACKSON advocated the liberal use of reflectors and the placing the sitter at some distance from the window. For outdoor use he had found a screen studio, as recommended by the President, of much value.

Mr. BISHOP had found indoor portraiture to necessitate too much disturbance of furniture to be agreeable; he therefore preferred to work out of doors, and showed some excellent results obtained in an ordinary suburban garden.

The next meeting will be held on November 20th, when the subject of "Dissolvers for Single Lanterns" will be discussed. This will also be the first lantern night of the season.

#### LEWES PHOTOGRAPHIC SOCIETY.

An ordinary meeting was held at the Glee Room, Cliffe, on Tuesday, the 6th of November. The President occupied the chair, and there was a good attendance of members. Three new members were elected.

The PRESIDENT then gave an address on "Focal Equivalents, Exposure, and Development." He handed round four negatives which had been developed respectively with ferrous oxalate, pyro and ammonia, pyro and potash, and hydrokiuone. He also exhibited a positive of the proboscis of a blow-fly which he had taken.

Several members passed round specimens of their work for inspection, and the Hon. Secretary, E. J. Bedford, showed some prints on Pizzighelli platina paper.

At the next ordinary meeting there will be a lantern slide exhibition, which will be only to members and their friends.

#### SHEFFIELD CAMERA CLUB.

An ordinary meeting was held on November 9th, at Bank Street, Dr. MORTON presiding.

F. Hall was elected a member.

J. O. Arnold exhibited a fine collection of silver prints, illustrating birds' eggs. The negatives were taken by himself and Mr. Winder, many of them by means of the magnesium light. The Chairman showed a bromide enlargement on the new Ilford bromide paper. He found that with an ordinary sciopticon lantern, and small rectilinear lens, stop  $f/11$ , it required about half an hour's exposure for a fairly dense negative. Mr. Barraclough brought an ingenious rapid shutter with lever movement.

J. H. RAWSON read a paper on "Stereoscopic Photography," illustrated by diagrams, slides, and apparatus. The lecturer said the principles of binocular vision were known to the ancients as far back as the time of Gallen; but the stereoscope was mainly due to Professor Wheatstone, and Dr. Brewster invented the lenticular form of stereoscope in 1849, which is the one generally used at the present time. Mr. Rawson described a method of taking two separate pictures from different points of view on one negative with paired lenses  $2\frac{1}{2}$  inches apart. He had used landscape, rectilinear, and portrait combinations for the purpose; about 4 inch focus he generally adopted. As the pictures were required of small size, he found a pair of landscape 6 inch focus useful in distant views. The way prints were reversed, trimmed, and mounted, was demonstrated, and a large series of stereoscopic views he had taken, including some beautiful collodion transparencies, were shown.

#### COVENTRY AND MIDLAND PHOTOGRAPHIC SOCIETY.

The annual meeting was held at the Dispensary on November 7th, Mr. Councillor ANDREWS in the chair. On the proposition of Mr. Ambrose, seconded by Mr. Orton, the accompanying report was adopted and ordered to be printed and circulated:—"The report now submitted by your committee shows a marked improvement in the strength and standing of the society, the advance of which is a cause of much congratulation. The membership has increased considerably, having more than doubled itself during the past six months, and although, owing to the



generally unfavourable condition of the weather during the past season, but one outdoor meeting has been held, that one was a most pronounced success, and for the first time in its annals the society was favoured with the company of the fair sex. This outing was held in Merevale Park, by kind permission of Mrs. Dugdale, and was much enjoyed, the attendance being larger than on any previous occasion, and the results, from a photographic point of view, above the average. The most noteworthy event of the year, however, has been the long-talked-of exhibition, which, suggested first five years ago, has at last been carried into effect, with results which your committee venture to suggest are creditable to the society, and which should be satisfactory to all concerned. The exhibition will have the effect not only of attracting local attention to the society and its work, but also, your committee believe, of establishing its reputation in the photographic world, and your committee takes this opportunity of thanking those members of the society who, by their exhibits, so contributed to its success, and also to those members who assisted them in the arrangement and conduct of the exhibition; and although financially the exhibition resulted in a deficit of £1 12s. 11½d., your committee do not consider this as money entirely lost, as the society must eventually be the gainer by the exhibition. In connection with the exhibition your committee have to report that, through the kindness of W. D. Welford, a newly-elected member of the society, they were enabled to give a series of lantern displays, which, they are happy to say, proved highly successful, and in this connection the thanks of the society are also due to Messrs. York and Son, G. W. Wilson and Co., G. West and Son, for the loan of slides, and also to those members who lent slides and appliances. A few other events of the year have been—1. The institution of a system of monthly exhibitions of work done by the members during the month on specified subjects, which, however, owing to pressure of other matters—notably the Exhibition—which has absorbed the attention of the Society to the exclusion of other things, has been allowed to fall into desuetude, though it is hoped it will be revived at an early date. 2. A successful lantern entertainment on March 7th, at which many of the friends of the members were present. 3. A paper on tinting lantern slides by Mr. Ambrose. 4. A paper on the construction and use of photographic lenses by the President. 5. A paper on lens combination and simple enlarging by Mr. Ambrose. Owing to change of residence and other matters, Mr. Weatherill has found it necessary to retire from the active duties of the office of secretary, which he has filled for a space of nearly three years, the thanks of the Society being due to him for undertaking the duties when no other gentleman was willing to do so. The balance sheet shows the Society to be in a good financial position, the amount to be carried forward to next year being £6 1s. 8d., as against £4 3s. 9d. last year. By adopting the plan of meeting at the residences of its members, your committee has been enabled to effect a considerable saving of the funds. Your committee, in conclusion, wish to impress on each of the members the fact that to maintain the Society in a flourishing condition from a photographic point of view, each one must contribute his quota to the papers read and the discussions arising therefrom, as by this means the general fund of information is greatly increased, as well as the usefulness of the Society. Trusting that the members are satisfied with the way in which they have performed their duties, your officers and committee, now that their duties have come to an end, place their resignations in your hands.

The following gentlemen were then elected to serve in the several offices for the next year:—

*President.*—Councillor Andrews.

*Vice-Presidents.*—C. Ambrose, C. H. Waters, H. Sturmev, and G. Winstanley.

*Committee.*—Messrs. Hardy, Owen, Clarke, Orton, and the rest of the officers.

*Treasurer.*—E. J. Walker.

*Secretary.*—F. W. Dew, The City Studio, Coventry.

The SECRETARY announced that arrangements had been made for a demonstration before the Society on Tuesday next, of the products of the Eastman Co., by Mr. Bellsmith, the company's representative.

Mr. STURMEV promised to give at the next meeting a demonstration of lantern slide making, and the meeting terminated with votes of thanks to the retiring officers, and particularly to the Secretary (Mr. Dew) for the manner in which he had conceived and carried out the arrangements for the exhibition.

# BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE ordinary fortnightly meeting was held in the Technical Schools, Bridge Street, on the 8th inst., W. J. HARRISON in the chair.

T. J. Davies, Thomas Hadley, J. A. Walton, and J. H. Wynn were elected members, and George Owen was nominated for election.

The question-box contained the following:—"What is the best dead black for inside of camera and slides?"

E. UNDERWOOD: Shellac, methylated spirits, and lamp-black.

A. PUMPHREY: Bates' varnish.

E. C. MIDDLETON: Albumen and lamp-black.

The CHAIRMAN exhibited Ackland's Sensitometer and Exposure Table, and presented the prize to the winner of the Development Competition (J. H. Pickard), consisting of an enlargement from Eastman film (Glen Helen, Isle of Man), executed by Morgan and Kidd.

F. Barnett and S. G. Mason were elected Auditors of Treasurer's books for ensuing annual meeting on November 22nd.

C. J. WATSON then delivered his paper on "Ferrous-Oxalate Developer." In the course of his remarks he said:—"In my opinion the ferrous-oxalate developer still holds its own for lantern transparencies, and in all cases where perfectly clear pictures are required. I use a mixture of—

Saturated solution of potassic oxalate	... 16 parts
Saturated solution of ferrous sulphate	... 2 "
Solution 25 per cent. ammonium bromide	... 1 part

An exposed plate may be left an hour or two if necessary, without staining; or if a slight yellowing of iron should take place it can be removed at once by immersion in alum solution containing a small portion of oxalic acid. The above developer can be used successively for four or five plates. Possibly I am in the habit of giving a slightly increased exposure which would imperceptibly be given when working with the same developer. The limit to the number of plates which it is possible to develop in the quantity of solution appears to be caused not by the exhaustion of the liquid, but by the formation (more especially in the cold weather) of a deposit upon the plate and dish of green crystals. These crystals are composed of potassic ferric-oxalate, and are well worthy the attention of the experimental photographer. They may be obtained in larger quantity by boiling and evaporating the spent solution (from development) until a considerable portion of the other salts have been thrown down, and then pouring off the clear solution and allowing it to cool, as the substance is only soluble in 10 parts of cold water, although soluble in half its weight at the boiling point. These crystals, when purified by re-crystallization, are of a beautiful emerald green, some of their faces being peculiarly striated, and when deposited from a weak solution give splendid colours with polarising microscope. When these crystals are exposed to sunlight they are decomposed on the side on which the light falls, and become encrusted with a coating of yellow ferrous oxalate, and in solution the same action takes place, a crystalline precipitate being thrown down. I have endeavoured to make use of this substance for photographic printing. By coating paper with a hot solution, and exposure some hours to direct sunlight, an orange print is obtained on a greenish ground; on treating the image with prussiate of potash and washing, the picture is reversed, so that it now becomes white on a bluish-green ground. This may be useful for obtaining positive prints direct from the object, such as botanical specimens, &c."

The Lecturer interspersed his paper with interesting practical chemical experiments and analysis and lantern slides.

# PHOTOGRAPHIC SOCIETY OF IRELAND.

THE annual meeting was held on Friday, November 9th, at the Royal College of Science, Dublin, T. A. BEWLEY, M.I.M.E., in the chair.

The report of the past year, and statements of accounts (which showed the Society to be in a most flourishing condition), were received and adopted.

Mr. Carson was elected a member, and Messrs. Mackintosh, Bradley, and Stubbs proposed for membership.

On the motion of F. A. Millar, seconded by J. C. Simple, a vote of thanks was passed to the Royal College of Sciences, for continuing to permit the Society the use of their premises.

The CHAIRMAN announced that the Judges (Messrs. Mansfield, Conan, and J. V. Robinson) had awarded the Society's medals



as under, viz. :—Best work of the season—Louis Mildou, for his instantaneous picture of a diver; Mr. Greenwood Pim, for an enlargement of a view in the Tyrol. Best photograph taken on annual excursion—Mr. Louis Mildou; highly commended—S. Baker and Dr. Browne.

The Secretaries of the ballot reported that the following officers and outgoing members of Council had been elected :—

*President.*—Sir Howard Grubb, F.R.S.

*Vice-President.*—George Mansfield, J.P.

*Treasurer.*—T. A. Bewley.

*Council.*—A. Conan, Greenwood Pim, T. Mayne, M.P., H. Bewley, Dr. Cosgrave.

On the motion of Mr. Woodworth, seconded by Mr. Simple, a cordial vote of thanks was accorded to Mr. Conan on his resignation of the office of secretary—a post he had held for ten years.

After considerable discussion, a change of rule was agreed to, vesting the appointment of secretary in the hands of the council.

After a few remarks from Dr. Scotton Baeklandt's dry plates, which develop in water only, and some lantern slides shown by Dr. Cosgrave, the meeting resolved itself into a *conversazione* to inspect the pictures sent in for competition for the Society medals, among which Mr. Mildou's wonderful studies of men diving, leaping, playing tennis, &c., attracted much attention.

#### DEVON AND CORNWALL CAMERA CLUB.

A MEETING of this Club took place at Messrs. Skardon's Rooms on Wednesday, 7th inst., at 8 p.m., R. MURRAY in the chair.

The council reported with regret the resignation of his seat in the council by Mr. Soltau-Symons, who was leaving the district for some months, and announced that Capt. Castle, R.N., had been appointed to the vacancy thus formed. Col. Heseltine and Mr. Roy were elected to vacancies on the council.

W. GAYE TWEEDY then gave a most interesting lecture upon "Lantern Slides," during which he exhibited about 120 of his own manufacture, printed by contact on Fry's or Thomas's plates from negatives obtained by him in a hand camera; lens,  $3\frac{1}{2}$  in. focus; exposures varying from drop-shutter to two minutes. A flock of Dartmoor sheep startled, the interior of Notter Mill, a view at Sutton Pool, were much admired. The subjects were very varied, as also were the exposures. Forest and stream, landscape and seascape, rocks, trees, snow scenes, tombs at Buckland Monochorum, and groups at 7.30 p.m. with 1-20th second exposure.

### Talk in the Studio.

ON THE INFLUENCE OF LIGHT UPON THE EXPLOSION OF NITROGEN IODIDE.—J. W. Mallet, writing in *Nature*, says :—The statement of L. Gatterman in his recent paper (*Berichte d. deutsch. chem. Gesellsch.* xxi. 751; following up V. Meyer's paper in the same volume, p. 26) on nitrogen chloride, that its explosive decomposition may be brought about, or its susceptibility to explosion much increased, by exposure to bright light, has recalled to my mind the fact, which did not specially impress me at the time, that I myself undoubtedly observed the same relation several years ago in the case of nitrogen iodide. In a paper on the preparation and composition of the latter substance, published in the first number of this journal (April 1879), it was noted that on two occasions the product obtained with the composition  $\text{NI}_3$  or  $\text{N}_2\text{I}_6$  "exploded in some quantity under water with much violence and complete shattering of the vessel." I remember distinctly that in one of these cases I had just carried to a window, through which the sun was shining, the beaker full of water at the bottom of which was the black sediment of iodide, and was gently stirring the liquid with a glass rod, holding the beaker up so as to look at it from below, when the rod touched the lower part of the side or the bottom of the vessel, and the explosion occurred. In the other case the iodide was being washed with the ice-cold water of ammonia, the vessel standing on a table exposed at the time to the direct rays of the sun. I do not remember with certainty what seemed to precipitate the explosion on this occasion, but I believe it was the pouring some fresh liquid, from the height of a few inches, on the black sediment of iodide which had just been partially drained by decantation. Under ordinary circumstances nitrogen iodide, while wet, exhibits no extraordinary sensitiveness, and

may be safely worked with, only becoming highly dangerous on drying, so that I have little doubt that bright sunshine was influential in bringing about these two explosions.

RE-ISSUE OF CASSELL'S POPULAR EDUCATOR.—The new issue of the "Popular Educator," the first part of which is before us, although vastly improved as regards matter and general style, has perhaps not such a large field of usefulness before it as was the case when the first issue took place about a quarter of a century ago, by cheap hand-books in all the branches of study being now so easily obtainable, and primary schools being available for nearly all. The part before us deals with English, Drawing, Geography, French, Human Physiology, Arithmetic, Music, History, Latin, Shorthand, Astronomy, German, and Geometry. Altogether we have 64 quarto pages, well illustrated, and at a cost of sixpence.

PHOTOGRAPHIC CLUB.—The subject for discussion on Nov. 21st will be "Photographic Mounts."

### To Correspondents.

\*. Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, Photographic News, 5, Fournival Street, London, E.C.," while Advertisements and Business letters should be forwarded to "PIPER and CARTER, Photographic News, 5, Fournival Street, London, E.C."

J. HAMPTON.—Use rather old collodion, expose moderately, and develop with a rather weak iron developer. The negatives can then be intensified by one of the mercurial methods.

J. FOX, JUNR.—1. There are very few shutters in the market which will give so short an exposure as that you mention. We think, however, that Wollaston's shutter, sold by Eidsforth and Mudford, Jackson Road, Holloway, will work rapidly enough; but this shutter is expensive, and has to be specially adapted to the lens. 2. The arrangement is a very excellent one, and the shutter works nearly to the speed you mention.

THEO. B. MARCH.—Thank you for your note. If anything occurs which will facilitate matters, we will let you know.

PHOTARGUS.—It is quite impossible to mention one as "best." Read Bothamley's articles on the subject, and those of Captain Abney now appearing in the NEWS. There is a good deal of information on the subject in the new edition of Abney's "Instruction in Photography," published by Piper and Carter, 5, Fournival Street.

J. M. G.—The best thing will be to soak it in a citric acid and alum clearing bath.

VICTIM.—1. Anyone who knowingly supplies such articles, and so ruins a photographer's business for the sake of a trifling gain to himself, is about as infamous a scoundrel as exists; and the fact that he cautioned you to avoid using an excess of moisture seems to indicate that he knew them to be deleterious. 2. We have mislaid the question; write again.

GEORGE KILBURN.—1. Pure methyl alcohol is rather an expensive article to buy, and must not be confounded with the so-called methylated spirit, which is a mixture of ethylic alcohol and the crude wood naphtha, the latter being a *very impure* form of methylic alcohol. You can obtain the methylic alcohol from Hopkin and Williams, Cross Street, Hatton Garden. 2. Alcohol at 96 % is alcohol containing only 4 per cent. of water. Most commercial alcohol contains a larger proportion. 3. Alcoholic ammonia is a saturated solution of ammonia gas in alcohol. 4. You might try it with Mawson's collodion as a basis, but of course we cannot say beforehand what the result would be. 5. We have never succeeded with the formula in question, our experience being like your own.

E. C. MIDDLETON.—Thank you for the communication.

W. ANDOCK.—We are much obliged to you for sending the print.

AMMONIA.—All depends upon the condition of the original mixture. If putrefaction commenced in the first stage, you had better throw all away, and recommence; otherwise it may be sufficient to neutralize as you propose.

F. J. B.—1. Dr. Higgins has given no further description of the arrangement, and should he do so, we shall publish it. 2. We think that, in this case, you will succeed if you use a softer and more absorbent material for the wick, and take care not to compress it too much. Sometimes a few waved wires worked into the wick, and kept below the level of the flame, are useful.

W. I.—Ordinary oil-colours, as sold in tubes, will answer, if sufficient time is allowed for them to dry, but water-colour rubbed up with white of egg is better. When dry, the surface of the work should be moistened with spirit (3 parts strong alcohol to 1 part water) to coagulate the albumen.



# THE PHOTOGRAPHIC NEWS.

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## CARBUTT'S CELLULOID FILMS COATED WITH EMULSION.

FROM John Carbutt, of Wayne Junction, Philadelphia, we have received a package which contains celluloid films coated with gelatine emulsion, and which are developed as easily as coated glass plates. The celluloid film is quite as transparent and as free from defects as the best glass, but the emulsified surface is slightly roughened, and as it takes about one hundred of the coated films to make up the thickness of one inch, it is obvious that, as regards lightness and portability, the celluloid films will hold their own with paper.

Sheets of celluloid coated with emulsion are not exactly a novelty, as several years ago the use of this material was advocated by M. David and others; but owing to the imperfections of the material used their results were crude and unpromising compared with these now before us.

Mr. Carbutt's success in putting his films upon the market has been mainly dependant on obtaining a supply of clear and glass-like celluloid, free from defects and uniformly thin; and in the second place, on roughing the surface so slightly and uniformly as to make the emulsion to adhere properly, and yet not to impair the transparency of the medium.

In celluloid we have a material which does not react in any way with moisture, and as it does not absorb moisture, it neither swells nor curls in the developing fluid. In fact, the use of these films offers no additional manipulation beyond what is required in the case of glass plates, and as soon as the negative is washed and dried it is ready for use. The film is so thin that in all ordinary cases the negative may be printed from either side.

Celluloid is virtually a colloid in which camphor is the solvent of the pyroxyline, camphor and pyroxyline being kneaded together at a temperature sufficient to enable the former to exercise a solvent action upon the latter. When a celluloid film is exposed to the air, the camphor slowly evaporates, and perhaps in the end we may have simply a film of transparent pyroxyline. Among the commercial applications of celluloid we may refer to its use for making artificial ivory (when mixed with a white pigment), and for making imitations of tortoise-shell.

In a letter Mr. Carbutt says:—"I commenced investigating this material—celluloid—some three years ago, but it is only during this year that the manufacturers have been able to furnish it to me perfect enough for photographic negatives, and it has every desirable quality of glass, without any of its drawbacks, and the same can be said of films on paper or other materials that require the after-process of stripping." One dozen quarter-plate films only just turn the scale at one ounce, and in a circular sent by Carbutt he says that "two dozen 5 by 8 films in a Carbutt Multiplex Film-holder weigh but 18

ounces, while two dozen 5 by 8 dry plates in twelve double holders weigh 225 ounces." We have not seen Mr. Carbutt's "Multiplex Film-holder."

As it is quite easy to roll celluloid into long strips, there should be no difficulty in supplying Carbutt film for the roll-holder.

## LIME DEPOSIT ON ALBUMEN PRINTS.

A SHORT time since we received from a photographer practising in a large town on the South Coast a print upon albumenised paper, which was covered with whitish patches presenting a mottled appearance over the whole. A letter accompanied the print requesting an opinion as to whether the mottling was due, as the writer supposed, to lime in the washing water, and if so what remedy should be applied to prevent a recurrence of the mischief; and why, in this case, the same trouble should not be universally experienced by himself and by the other photographers who employed water from the same supply—that which was furnished in the usual way by the town authorities.

A very slight investigation sufficed to show that the surmise of the photographer, as to the cause of the mottled appearance being due to a deposit of lime (or, more strictly, carbonate of lime) from the washing water was the correct one. That it was a deposit, and not an eating away, or incipient fading of the print, was shown by the fact that on being held up to the light the places where the whiter surface was visible were slightly more opaque than the rest, instead of being more transparent, as would have been looked for if there had been fading. The only thing which tended to suggest that the markings were not deposit, was the fact that moderate spouging failed to remove them, as although mere wetting made them nearly disappear, they showed, on drying, almost if not quite as badly as ever. Very hard spouging nearly got rid of the marks, but it had to be so hard as to damage the surface of the paper, to the extent that on drying, there was a patch of comparative dullness where so much pressure and friction had been employed.

Application of dilute hydrochloric acid to a portion of the surface of the print at once put it beyond doubt that the deposit was, as had been surmised, one of carbonate of lime. A solution of a strength of one part of acid to ten of water was employed, but a much weaker one would, doubtless, have sufficed. There was visible effervescence, and in a few seconds a complete solution of the deposit. The print being rinsed two or three times, and then washed in running water for a quarter of an hour, was taken out and dried. On drying, the portion that had been treated with acid was found entirely free from the mottled stain, whilst the remainder of the deposit, which, as previously mentioned, showed but slightly when wet, came up with its original vigour.



The measures to be adopted in a case of the kind under consideration, naturally divide themselves into two classes. The one class includes all means that may be used to prevent a deposit from being formed in the prints, and the other class the methods to be employed for the removal of the deposit when once formed. Treating the latter or remedial method first, we see no reason to suppose that any injury has accrued to the print either in present appearance, or what is, perhaps, of more importance, in the probability of ultimate fading, from the course we adopted of the application of dilute acid. Photographers have been properly warned against the evil of having a trace of acid in the hyposulphite bath, and are naturally inclined to think that an alkaline condition of the solution all through is that which is most compatible with success in printing generally, and particularly with a probability of permanency in the finished result. When, however, the hypo has been entirely removed from the print by proper washing, there is no reason to suppose that a short immersion in a dilute acid solution, followed by copious washing, can have any deleterious influence. We propose, however, to retain a strip of the print upon which we have experimented—a strip including a portion from which the deposit has been removed by acid, and a portion which has not been so treated—for the purpose of observing if any difference appears in a reasonable time. Another similar strip will be subjected to the well-known accelerating influences as regards fading of light and moisture. Acetic, citric, or other acids familiar to the photographer, may be employed instead of hydrochloric; sulphuric acid, however, should not be used, as sulphate of lime is itself almost insoluble.

The last-mentioned consideration brings us to the fact that "hardness" of water is of two kinds, the first and most common kind being that which existed in the case under discussion, where the lime exists in the form of carbonate held in solution by excess of carbonic acid; and the second kind where the lime is in the form of sulphate. The latter kind of hardness is that known as permanent, because there is no ready way of precipitating the dissolved lime, as is done in some chalky districts where the temporary hardness due to carbonate of lime is so pronounced as to be recognised as a serious inconvenience. With water permanently hard there is not the same tendency to form deposit, and we have never heard of a photographer suffering from any such settlement on the surface of the print from this cause. If any case should occur, however, the acid remedy will not be available, as the sulphate of lime deposit is not soluble in such a menstruum.

With regard to the preventive measures that might be used, the best would, no doubt, be the precipitation of the carbonate of lime from the water by the addition of a proper quantity of lime water, as is done by the authorities in those districts which have been referred to. It is too much, however, to expect the photographer to undertake a duty like this, which is so much better and more cheaply performed by municipal or other authorities. Something might be done, however, by having two cisterns to be used on alternate days. If the cisterns are in a sunny or other warm place, a great deal of the carbonate of lime would deposit either on the bottom of the cistern, or as a fine precipitate, giving a milky appearance to the water. This milkiness could be removed by filtration or settlement, if desired, but the deposit once formed in the water itself has not the same tendency to adhere to the surface of the print as when it is deposited in the presence of the paper. Another and simpler method is to employ a rapid washing instead of a long soaking. If, after the first half hour's washing in frequently-changed waters, the prints are well sponged, and then washed in warm water, and again washed in a few changes of cold water, there will not be time for a firm, hard deposit to form. This is a method of washing which we have before recommended as probably more conducive to permanency than the time-

honoured night's soaking weekly extending into two nights with a day intervening. This method, which we have known to be adopted on other grounds than those connected with a lime-bearing water supply, and which has stood the test of several years' experience with apparent success, is one which should effectually prevent any such mischief arising as the hard deposit on the print which forms the subject of this article.

### THE NITRIC OXIDE FLASH LIGHT.

SEVERAL times during the past few years we have referred to the use of what is generally known as the nitric oxide flash light for photographic purposes, but it has not yet come into anything like general use, and at present it is not very easy to certainly conjecture whether this light will in any way compete with the magnesium flash. Indeed, as magnesium becomes cheaper, and its use becomes better understood, the probability of it being ousted by the nitric oxide light may seem to diminish, especially when one considers the offensive character of carbon disulphide, and the fact that the nitric oxide gas must be prepared as wanted. On the other hand there is the circumstance that burn magnesium how you will, there is white smoke which makes the atmosphere thick. True it is that arrangements exist by which the smoke may be in great part collected or condensed, but such arrangements are complex, often cumbersome, and not always certain.

In view of the increasing attention given to this subject, we now quote from the current number of *Anthony's Bulletin* the following remarks on the nitric oxide light:—

"The use of nitric oxide gas and carbon disulphide vapour for producing photographic negatives is by no means new. We well remember seeing experiments of this kind made many years ago when we began our first studies of chemistry. It has been long known that a mixture of hydrogen and chlorine when mixed in the dark, or in a yellow or red light, will remain without any apparent action upon one another for some time; but if such a mixture is brought into sunlight, the two gases unite with explosive violence and form hydrochloric acid gas. If, instead of sunlight, the light from a mixture of nitric oxide and carbon disulphide vapour is used, the same violent union of the two gases will take place, producing the same hydrochloric acid gas. From these experiments it is evident that the light from the nitric oxide mixture is chemically almost as active as sunlight.

As early as 1874 a German chemist named Sell sought to utilize this mixture for the production of pictures at night, and the subject was investigated by our esteemed correspondent, Dr. H. W. Vogel, who published his results in the *Berichte der Deutschen Chemischen Gesellschaft* for 1875. Sell burnt a mixture of nitric oxide and carbon disulphide vapour in a lamp specially constructed for the purpose, and it was this lamp that Dr. Vogel submitted to experiment. As a result, he found that the light produced had a decided chemical activity, but was not as strong as average daylight. To produce a negative by the nitric oxide lamp it took quadruple the amount of time needed in daylight on a clear winter's day at noon. The light was also found to be rich in violet and blue rays, which latter rays give it an advantage over other light sources for portrait work, as the colour blends with the blue colour of the eyes. But it was also found necessary to have a specially arranged flue or chimney to carry off the products of combustion, which consist largely of sulphurous oxide gas.

From what has been said above, it can be seen that there are some advantages in this source of light for photographic work; but the disadvantages greatly outnumber them.

In the first place, the nitric oxide is most easily made by acting on copper with nitric acid, but made in this way it requires a specially constructed apparatus, and its quality is very variable, since it contains more or less nitrous oxide. Again, the use of chemical apparatus and nitric acid for the production of light in a photographic studio is to our minds entirely out of the question. We have not heard of any attempts being made to store the gas either in cylinders or otherwise, for it is a powerful oxidizing agent, and corrodes metal very readily. Nitric oxide gas coming into contact with the



air unites at once with the oxygen of the latter, forming nitrogen tetroxide, a red gas, very corrosive upon the mucous membranes of the throat and lungs, and highly dangerous.

We have on several occasions suffered severely from inhaling this gas, and we have seen several hemorrhages produced in others, caused by carelessly inhaling the red fumes produced by the oxidation of nitric oxide in the air. This fact alone appears enough, in our minds, to prevent the use of the nitric oxide and carbon disulphide light under ordinary circumstances. The carbon disulphide, also, is by no means an agreeable fluid to have around. Its bad odor, unless specially purified, is a great bar to its use, and a fluid that is constantly giving off sulphuretted vapours is a bad addition to any photographic studio or laboratory."

## DISINTEGRATION OF PHOTOGRAPHIC LENSES IN INDIA.

*The Journal of the Photographic Society in India* says:—

The fact of finding one's favourite lens covered with a peculiar growth at this period of the year is so common to all photographers in India that there probably is not one who is not familiar with it in some shape or another. We have made this growth a study for some time, though we must confess we have not reared it on specimens of valuable lenses, as we should have wished to do in order to compare results. Suffice it to say that all lenses are apparently liable to be ruined out here, unless some care is bestowed upon them during the rainy season at least.

What this growth is has not yet been settled, but it only makes its appearance when the atmosphere reaches a certain degree of humidity, spreading rapidly over the surface of the glass just like frost on a window-pane. Examination with a magnifier reveals nothing more than what is known generally as "mould," and the early application of a rag will remove every trace of the enemy; but if the mould is allowed to remain, it very soon, as it were, takes root, and in time eats through the polished surface of the glass, leaving a rough surface like ground glass. A brown stain usually accompanies this growth, and is found as a ring round the spots of mould. Various methods, such as spirits of wine, have been recommended for clearing away the growth, but when it has once taken a firm hold, we have not found any preparation of any practical value in removing it. The growth, as a rule, forms on the softer descriptions of glass with greater rapidity than on the harder varieties, therefore it usually appears on crown glass before flint. This, however, is not always the case, as experience has shown that the fungus attacks Steinheil's flint glass lenses, if anything, more readily than other descriptions. Again, foreign lenses seem to take the fungus more readily than those by the best English makers, though the latter, if not attended to in time, become equally ruined. The best remedy will naturally suggest itself, namely, to keep all lenses constantly wiped with a soft cloth or leather.

We have had lenses shown to us which have been ruined beyond repair from want of attention, and oddly enough, new lenses appear more liable to the growth than those which have been in use in this country for a few years. Should a lens not be required for some time, the safest method is to grease the surface of the glass, which forms a certain protection, and can easily be removed when required.

Yet another instance of trouble in keeping lenses. We have just received two lenses by a well-known maker, which have the appearance of being cracked in some extraordinary manner, and until the combinations are separated, it would be impossible to finally decide what is the matter with them. Assuming that they are not cracked or "starred," it is probable that the glasses have been mounted too tightly, and the hot weather has caused them to expand more than has been allowed for, and the balsam used to cement the combinations has been displaced. It seems that the lenses have been badly cemented, too much

balsam having been applied, for in one case the displacement has taken the shape of lines like cracks, and in the other a very curious appearance presents itself, for the cement has crystallised. Such occurrences as this might be expected with cheap lenses; but when our leading makers are brought into question, it becomes a serious consideration when paying a long price. We are bringing the matter before the makers, and shall be glad to know whether any other members can report further instances.

## THE OWNERSHIP OF THE NEGATIVE.

ONCE more the old and well-worn subject of the ownership of the negative has been brought before a law court, and in this case with the result that the photographer has been ordered to give up the negatives in dispute. Photographers should be careful to specify for the supply of copies or photographs in their estimates, as, if they charge for "photographing" a subject, there may be—and, indeed, often is—a misunderstanding as to the ownership of the negative.

The following report of the case referred to above is from the *Kent Examiner* of November 16:—

ASHFORD COUNTY COURT, NOVEMBER 14.

S. W. Barns, photographer, Ashford, v. Rev. C. L. Marson, rector of Orlestone; claim, £3 for photographs supplied.—Mr. H. H. Gore, of the firm of Gore and Munro, solicitors, Bristol, appeared for the defendant.—Mr. Barns stated that he was instructed by the Rev. C. L. Marson to take photographs of the rectory and the church of Orlestone. Plaintiff at first wrote offering to take the photographs required for £3 15s., but defendant objected to spending more than £3, and asked if plaintiff could take the rectory in three aspects, and the church in two for that sum. The letter also contained the following words, "You do not say whether your estimate includes copies," and the writer asked for six copies from each of the five negatives for the sum named. If this was not satisfactory, he asked Mr. Barns to state what he could do for £3. In reply to this, Mr. Barns wrote saying the price quoted was for one copy from each negative; however, in order to meet the defendant, he would supply two copies from each negative for £3. In answer to this, Mr. Marson wrote, "That will do; come any day you like, and I shall be pleased to give you food." Witness, therefore, went down and took the photographs, and on sending the copies defendant wrote saying he was very pleased with them, and stating that he should have no objection to Mr. Barns selling copies around the district. He asked for a quotation for the set unmounted, and Mr. Barns mentioned twelve shillings. Mr. Marson, however, said he thought a guinea a dozen would be a fair price "if he had not bought the negatives," and that was the first he had heard of any claim for the negatives. Mr. Marson added that unless they could agree upon a much more moderate price for copies, he had better have the negatives. Witness had had thirty years' experience as photographer, and had never heard of such claim, and he had distinctly stated in his letter that it was copies that should be had for the money. In reply to this he offered to let defendant have eighteen copies from the six negatives, together with the negatives, for £4 4s., and added that had he known defendant was going to set up such a claim he would have declined the order. In reply to Mr. Gore, Mr. Barns admitted that he had no written permission from the defendant to keep the negatives. He did not answer the letter sent him by defendant's solicitors. Mr. Gore said his client was and always had been willing to pay for the photographs, but he set up a claim to the negatives, and this claim was a perfectly legal one, as laid down in Copinger on Contracts.—The Judge expressed his surprise at this contention, and said he had never heard of such a claim, but if it was law that the person ordering the photographs was entitled to the negatives, it appeared that defendant was right. The Rev. C. L. Marson having been sworn, stated that when he made the contract he argued that the high price was caused by the negative, and he understood that the negative was his property. Although it was not the custom to claim negatives simply because they would be of no use, he had claimed them because of the exorbitant charges.—The Judge having looked up the law on the subject, came to the conclusion that the defendant was entitled to the negatives by law, and that no contract had been



entered into that would take away his right. He thought, however, that Mr. Marson was wrong in not paying the £3 into court, and bringing a counter claim for the recovery of the negatives. There would be no order as to costs, but Mr. Barns would have his court fees.

We think in this case that the photographer has been very hardly used, and that in spite of his legal victory, the Rev. C. L. Marson may even now be reasonably expected to waive his claim and enter into some arrangement for the supply of copies.

The *Kentish Express* of the 17th instant seems to considerably misunderstand the position of things, as will be seen from the subjoined quotation:—

The decision of Judge Selge in a county-court case heard at Ashford this week revolutionises the photographic profession. Mr. Selge ruled that a negative belongs to the customer and not to the photographer, unless there is a written undertaking to the contrary. This decision will naturally cause an immense amount of chagrin to photographers, who always reckon upon obtaining as much ultimate profit in striking off copies of a negative, months and even years afterwards, as they do at the actual sitting. This handing over of the negative will prove especially disastrous in these days of popular amateur photography, by means of which a private individual can obtain his negative and strike off as many prints as he wishes. The only plan for the photographers is to secure written agreements from their customers. We do not for a moment dispute Judge Selge's law, but there seems but little equity in the decision."

The decision alters nothing: it merely emphasizes what was known before—the need of a clear understanding that the charge is so much for "first copy," after copies being then supplied at a lower rate.

## THE PRACTICE OF NEGATIVE RETOUCHING.

### No. 4.—THE PENCILS.

BY W. E. DEBENHAM.\*

THE next subject for consideration is that of the pencils to be employed. These should be of the finest quality obtainable, but as price and quality are not invariably concurrent, it is well to point out the characteristics by which a good pencil can be distinguished from a bad one. The great points to be observed are fineness of texture and uniformity of the lead. Want of uniformity shows itself by some portions of the lead marking more freely than other portions, so that a mark which with a certain pressure of the hand is intended to produce a certain depth of stroke may be lighter or heavier than desired. Want of fineness of texture is a still more serious evil, and a pencil deficient in this respect should on no account be used. The evil will show itself by a crumbling away of the point. This not only necessitates constant re-sharpening, but worse still, the crumbled fragments are apt to mark the negative with places stronger than the rest of the work. The lead where the point has broken off, falling on the plate with a fresh unpolished surface, and, perhaps, a fragment of lead under it, makes a mark that cannot easily be got rid of. Short of actually finding out by these evils occurring, the defective character of the lead, a judgment may be formed from another sign. A good lead of fine and close texture bears a high polish, whilst an inferior one of the same degree of hardness shows somewhat greyer and duller. The difference is not great, but is yet perceptible, and will show on the sharpened points as well as along the side of the lead.

Pencils of various degrees of hardness are required, and these degrees are represented by numbers with some makers, and by letters by other makers. The degrees in use run from B or BB to HHH, or from No. 1 to 5, the higher numbers indicating great hardness. Harder pencils than these are sometimes recommended, but I have not found any occasion for their use. A good deal depends, however, upon the lightness or heaviness of the

touch of the individual, as to what degree of hardness will be required for a particular depth of stroke; whilst the character of the varnish or medium used, the intensity of the negative, and the strength of the places to be worked upon, will determine the choice of a harder or softer lead for use as occasion may require. A practised retoucher will be able to do with one lead of a medium hardness, work that it would be unsafe for a less experienced hand to attempt without a change, so that old hands will often not require to change their pencils all through a negative, and, indeed, for several negatives in succession if of fairly uniform quality, and without any very transparent places requiring an extra amount of deposit upon them.

Lead pencils in use are in two forms. The first is the old kind fixed in cedar, fig. 1. When these are used the

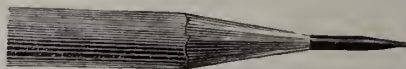


Fig. 1.

wood should be cut tapering rather finely, and half-an-inch or rather more of the lead should be exposed. If cut as for writing or ordinary drawing purposes, the work will be too much hidden by the wood. The exposed portion of the lead is sharpened, slightly conically to preserve its strength, to a fine point.

It is more customary now to use pencils with movable leads in holders, as shown at fig. 2. The trouble of sharpen-

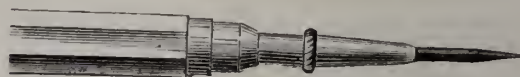


Fig. 2.

ing in so far as cutting away the wood is concerned is dispensed with, and the pencil is kept of one length and weight. The length of lead which it is desirable to expose, and the kind of point to be given, are the same as when solid wood pencils are in use. It is desirable when using these holders to have at least three of them for leads of differing degrees of hardness, and not to depend upon one holder, and changing of the leads in it, a course involving loss of time, and some additional risk of breakage. The holders should bear some distinguishing sign by which they may readily be recognised. The most marked way is to have them of different colours, and there is no difficulty in this, as they are made of red, black, and polished cedar. If the retoucher has them all of colour, and not marked by distinguishing letters, it is very easy to cut notches corresponding with the number on the lead contained in the holder.

As an example of quality of lead being sometimes independent of price, I may mention, that noticing the good quality of some pencils that had been obtained for writing purposes at a few pence per dozen, I thought I would see if they were good enough for retouching, and sharpening one, found it work very well indeed. I used that pencil right off—it was marked H B—for several heads without wanting any change. Of course, the probabilities are not in favour of finding leads of fine quality in low-priced pencils, and it would be ridiculously misplaced economy to use any lead of an inferior quality, whatever the price.

For sharpening the point, the most convenient thing is the fine glass paper block sold for the purpose. When one surface is worn out there is only to strip it off and another is ready for use. Where these blocks cannot be obtained, a strip of fine glass paper is attached to a piece of wood or millboard, but care must be taken that there are no lumps in the paste or glue, which would throw up a ridge on the surface of the glass paper that would interfere with its proper use. The lead is laid on its side and ground away with a motion from side to side, whilst the

\* Continued from page 661.



holder is slowly revolved to expose all sides to the cutting action of the glass paper.

After sharpening, the lead should be wiped before being applied to the negative, otherwise a little of the powdered lead adhering to its surface may cause the first stroke or two to be blacker than was intended, and not in keeping with the rest of the work. For wiping off this powder, the lead may be drawn lightly through a soft cloth held between the fingers, or the plan may be adopted of drawing it through the pile of a piece of Utrecht velvet, such as is used for covering chairs and other articles of furniture.

## GAS IN CYLINDERS.

BY F. A. BRIDGE.

THE introduction of the thoroughly efficient gas governors invented by Mr. R. Beard has undoubtedly done much to popularize gas in cylinders, as they enable the gas to be used in any proportion, and to be regulated from the jet. Dissolving, too, is now rendered as easy as with bags. Portability, and getting rid of the job of making the oxygen, and filling the hydrogen bag after arrival at the hall where the "show" is to be given, is another very strong argument in favour of cylinders. If they are to be still further patronized by exhibitors, however, there are two or three things that will have to be "looked" to by those who make compressed gases.

The so-called pure hydrogen is sometimes no better than coal gas; in fact, the latter is often to be preferred. The oxygen, too, is frequently very inferior in quality. I am not for one moment asserting that this impurity is always intentional, but the fact remains that I have had oxygen supplied to me in cylinders which would not give more than 50 per cent. of the light to be obtained from "home made" gas obtained from a good sample of chlorate of potash.

As to the occasional sending out of an empty cylinder instead of a full one, this is of course due only to carelessness; no maker would do this intentionally, as it generally results in the loss of a customer. All users of gas should provide themselves with a pressure gauge; this would in most cases prevent their attempting to illuminate a screen successfully from an empty bottle.

There is one thing, however, which is of more importance than anything I have alluded to—viz., that the oxygen and hydrogen cylinders should be painted different colours to prevent the chances of accident.

Only recently I had a couple of bottles sent to me for use at a public exhibition. Both were painted black, and no indication appeared on them to show which was which. They were sent back to be filled up after the exhibition, and one trembles to think what would be the result at the next show if oxygen were pumped into the hydrogen cylinder, or *vice versa*.

Those who use compressed gases should positively refuse to deal with makers who do not paint their hydrogen cylinders red; and makers would find it to their interest if, instead of cutting against each other for price, they would charge such an amount as would enable them to supply full cylinders of pure gas "unmixed with baser matter," instead of sending out misleading mixtures which "are not what they seem."

## ON TONING DIFFICULTIES.

BY VALENTINE BLANCHARD.

FROM time to time complaints crop up, in the journals and elsewhere, of the difficulty experienced in toning the ready-prepared papers. Now it is undoubtedly true that they are slower to tone than the papers prepared in the ordinary way, and the higher the gloss the slower the operation. This is so well known that it is not necessary to further dwell upon it. It is not the ordinary slowness

that I wish to refer to, but a strange and abnormal condition of things when the prints refuse to tone altogether or tone unequally, producing a most undesirable mixture of blue and red. This complaint is frequently most puzzling to the maker of the sensitive paper, for by the same post sometimes will come letters praising a certain batch of paper, speaking specially of the admirable tone produced on it, and other letters also referring to the same batch containing anything but praise, and specially condemning its obstinacy in the toning bath. A key to the mystery offered itself a short time since.

It is an undoubted fact that the more highly glazed papers are less permeable to aqueous solutions than the ordinary albumenized papers; but this fact is too frequently overlooked, and it follows, therefore, that if only a small batch of prints are toned, that though the usual changes of water have been given, the time occupied in the operations has been considerably lessened. In consequence of this the prints have not become thoroughly soaked through the entire fabric. And though the toning commences on the surface, after a time it proceeds unequally, or seems to stop altogether.

This was forcibly brought home to me the other day. A few prints, the results of some experiments, received the usual changes of water, and commenced to tone slowly, for the bath was cold. After a time two layers of colour seemed to show, for the upper was purple, but apparently, just beneath the surface, was an unequal tone of red. In fact, it was an indisputable case of unequal toning. I at once prepared some fresh prints, and washed a portion of them thoroughly, and another portion I treated with carbonate of soda in the second water, and thoroughly washed afterwards. Both these lots toned perfectly, without the slightest trace of mealiness. To make sure that results so different were not accidental, I once more repeated the experiment, and once more the slightly washed prints toned unequally; but the others, sufficiently washed, toned perfectly, as did also those treated with carbonate of soda. In each case a freshly prepared borax toning bath was employed.

## A PHOTOGRAPHERS' DEFENCE UNION.

BY S. J. DEBENHAM (SOLICITOR).

IN the present day the necessity, if we would succeed in our calling, of devoting all the energy and will at our command to its service is a paramount necessity.

Competition is so eager, and its various aspects so diverse, that one must be continually on the *qui vive* to seek out new developments and possible improvements for the perfecting of the art, and to appropriate all available appliances for the production of the best results. Such keen attention and such unflagging exertions are called for, that we get absorbed in our avocation, and are apt to forget the necessity for keeping our eyes open to other matters affecting our position and welfare.

Photographers, however, cannot, any more than any other classes of the community, "pursue the even tenour of their way" after this fashion with impunity. In fact, this absorption tends to make the way uneven and rugged, and a man may suddenly find himself in a dilemma equally unexpected and disagreeable for want of a little circumspection, which he cannot, he thinks, afford to bestow, but which ultimately, it may be found, he could not afford to dispense with.

Among the least inviting of these outside matters, is the consideration of the law—the legal points which arise in the daily conduct of life and business. I suppose it is impossible to make it a pleasing or attractive subject; in fact, I have been told by a fellow-contributor that, with the best goodwill in the world for reading my articles, they are too dry; and perhaps, less interesting even to him than the most scientific paper he writes can be to me. Yet I know a man who was engaged in an active city



business for many years, who assured me that his favourite reading was Blackstone's Commentaries.

There are many matters in which photographers may come in contact with the law in the pursuit of their calling, and it appears to me strange that a profession which has many societies and associations for the discussion of its interests and position, should be without an organisation for dealing with these questions. Other businesses and professions have their trade protection societies and unions, but, so far as I am aware, there is no such thing as a photographers' trade protection society or legal defence union.

I suppose there is as much *esprit de corps* amongst photographers as in other branches of commerce; in fact, probably more, for not many callings are so fascinating and attractive in themselves. What pleasure can there be in measuring yards of cloth, comparing samples of tea, or even estimating prices and quotations on the Stock Exchange, or unravelling the mysteries of a complicated title blind, or treating an obstinate case of skin disease, compared to the satisfaction in producing an acceptable and pleasing group of portraiture or other representation of nature? In fact, many apparently take to the avocation because of its agreeable nature, and because of its mostly gratifying results.

We may suppose, then, that this feeling binds photographers together, and gives them the same fellow-feeling as, say, artists not photographic.

If this is the case, it might be desirable to establish an association of the nature I have referred to, which might have its periodical meetings, when cases or points which have occurred in the experience of members might be brought forward, and notes compared and inquiries answered.

Many matters on which conference might be useful will occur to the reader. The question of injurious mounts, or defective apparatus or materials, difficulties about goods ordered and wrongly delivered or injured by carriers, injuries to negatives, obstruction of light, nuisances, claims for money in dispute, &c. In fact, there would be no lack of material for investigation.

## A CURVED SUPPORT FOR BROMIDE PAPER IN MAKING ENLARGEMENTS.

BY LEWIS WOLFF.

WHILST working last winter at enlargement making with a friend, we found the employment of stops for the purpose of obtaining better definition near the edges of the picture prolonged the exposure to such an extent as to become, especially with dense negatives, a tedious business. Twenty minutes is a long time to wait when you have nothing to do to fill up the time. To obviate this, the idea occurred to me that if we could bend the paper to the curve of the image as projected by the lens with the full aperture, so that the ends of the paper are made to come nearer to the lens, we should find the picture approximately focussed at the edges without the use of stops, and the necessary exposure would consequently be greatly reduced.

It will be at once apparent that this idea, though correct in theory, is but partially practicable. To carry it out perfectly, the support should be curved in all directions, so as to form a concave disc; but as the paper cannot be made to take such a shape, this is impracticable. Now, as I make the curve take the direction of the long way of the paper, it will be found that we have a sufficient advantage to make it worthy of adoption, and I feel convinced that anyone who once makes use of this plan will always follow it.

An easy way to find the amount of curvature necessary is to focus carefully the centre of the picture with the full aperture; then hold a piece of white paper on the edge of the picture at one end of it, so that some of the detail falls upon it; then move this slowly towards the

lens, keeping a careful watch to note the moment it comes into focus; the distance the paper has been moved towards the lens should be measured with a rule or pair of compasses. Next prepare two strips of wood, say about half-inch wide, and of a thickness equal to the distance the piece of paper was moved to bring the edge of the picture into focus. These strips should be slightly thinner at one edge, as shown endways at C, fig. 2. Nail these on to the easel, or board which is used as such, so that they will come just under the ends of the bromide paper; cut a sheet of stout cardboard to the size of the bromide

Fig. 1.

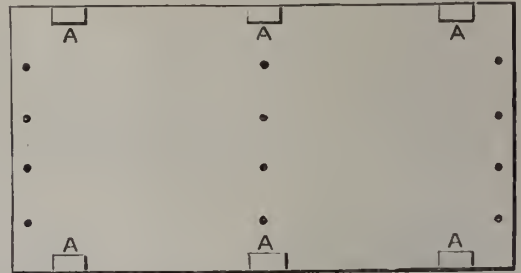


Fig. 1 shows front view, giving position of clamping tins, A, for securing the bromide paper to the card support, D.

Fig. 2.

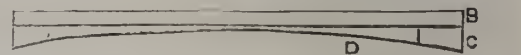


Fig. 2 shows section, B being the board or easel; C, the strips of wood to give the necessary curvature; D is the card curved to support the paper.

paper, and tack it on to the board or easel, putting the tacks in the position of the dots, as shown in fig. 1, the ends of the card upon the two strips of wood. Next procure six pieces of thin tin about a quarter of an inch square, and bend them into the shape of the letter V, with the sides sufficiently close to enable them to be used as clips for holding the paper close to the card. The bromide paper can now be attached to the cardboard by means of the six clips, as shown at A (fig. 1); these will, if properly placed, hold the paper to the curve of the card. On projecting the image upon the paper, it will be found to be fairly well focussed all over.

## TESTING PHOTOGRAPHIC MOUNTS.

REMARKS ON MR. FOXLEE'S METHOD.

BY JOHN SPILLER, F.C.S.

IT is no small satisfaction to me to find that Mr. Foxlee has confirmed in many particulars the view which I ventured to express regarding the low quality of some of the photographic mounts now to be found in commerce. In his valuable contribution, which you reproduced in the NEWS of the 9th inst. (page 706), proof is given of the highly deleterious nature of the bronze often used to embellish the cards and in printing the artist's name and address. He makes mention, likewise, of the tendency to stains appearing on the proofs as the result of a soluble kind of pigment being employed in some instances, and goes on to affirm that he has found cards totally unfit for photographic purposes, upon which, "if silver prints be mounted, permanence must not be expected." This is enough to justify a remark being made as to the desirability of perfecting the test which Mr. Foxlee proposes to be used by every photographer on his own account. The plan is admirable, except, I would submit, in one particular. Take a light print, damp it and lay it face downwards on the trial mount, one-half protected from contact with two or three thicknesses of paraffined paper; next put behind the



print "a piece of pure paper, such, for example, as Joynson's writing paper," and secure them in position by a couple of paper fasteners. Back up with a pad of damp, not wet, blotting-paper, and put under heavy pressure, &c.

The modification I have to propose is to dispense altogether with "Joynson's writing paper;" for, however good this is allowed to be for its legitimate purpose, it does not offer the guarantee of being perfectly free from antichlor and such-like chemicals, since it was never specially prepared for photographic use. I should much prefer to lay a clean glass plate immediately on the back of the moistened photograph, and then clamp or tie this to the mount. If any signs of fading should then occur on the unprotected half, we know for certain that the deleterious matter must have come from the card, and not from the writing paper or paddings. I only mention this as one point of criticism which appears to me to mar the accuracy of a very capital test; and, with this modification introduced, Mr. Foxlee's method of proceeding ought to find general acceptance with the profession. Leave no loophole for possible contingencies being admitted in the awkward event of a photographer having to prove his case and submit to cross-examination as to his mode of applying the test.

#### A NOTE ON THE USE OF GELATINO-CITRO-CHLORIDE PAPER.

BY W. K. BURTON.

PRINTING by the gelatino-citro-chloride process—or, I should, perhaps, rather say, printing on commercial gelatino-citro-chloride paper—was a thing that I was very fond of when I was in England. I considered that the paper gave better prints from a certain class of negatives than could be got by any other process. I will even confess that the brilliant gloss that is so easily got on this paper had a certain attraction for me. I am not Philistine enough to prefer a glazed to a really matt surface, but I am quite prepared to support the opinion that if you do have a gloss you should have a good one whilst you are at it. I think that there is nothing so objectionable as the half-and-half sort of gloss of inferior albumenised paper, or of single transfer carbon prints. Moreover, there can be no doubt that the gloss adds to the depth of the shadows, and makes it possible to get brilliant prints from some negatives so thin that brilliant prints could not be got from them by any other printing-out process. Of course, we all know that these are negatives that no fellow ought to have, yet I imagine that there are very few photographers who have not some of them.

The process is one that I used to work with uniform success in England, and I met with the same success here when I got out a few quires of the paper last spring. The prints were greatly admired by the Japanese, who liked the lacquer-like surface particularly. A number of my friends and myself consequently clubbed together, and sent to Europe for a considerable quantity of the paper. It came, and with it the first troubles that I have ever had in working such paper. I cannot say that the paper was bad, as I am just about to describe how I managed to work it with complete success; but I am pretty sure that it differed in some way from former lots by the same maker. The first indicator of breakers ahead was the softening of the film in the toning-bath, and eventually the melting of it in parts, and this with the temperature below 70° F. The bath that I used was the sulpho-cyanide and chloride of gold bath generally recommended with the paper. It is now pretty well known that sulpho-cyanide has a great solvent action on gelatine—a fact, so far as I know, first pointed out by Lyonel Clark. I therefore reduced the amount of sulpho-cyanide to one-half that given in the formula sent out with the paper, but here other difficulties presented themselves. There was great difficulty in getting evenness of tone; the tone

that was got was cold and disagreeable, and, although the film did not actually melt, it softened to such an extent that it was most difficult to handle the prints. Moreover, it did not harden in an alum solution, and, as I expected, adhered to the glass on which it was dried, so that there was no getting it off.

Other toning baths that have been recommended for gelatino-chloride paper were tried, but with very little better success, and so I set off on a hunt for some way of getting over the difficulty. I succeeded at last, even beyond my anticipations, and am so pleased with the method I now use, that I have no intention of departing from it. The bath that I use is simply a hypo and gold solution. I do not remember that this bath has ever been recommended for gelatine printing-out paper, but I have no doubt that it has. I think, however, that a brief description of my way of working may be of use to some.

The toning bath is made up as follows:—

Hyposulphite of soda	...	...	4 ounces
Chloride of gold	...	...	6 grains
Water	...	...	1 pint.

The prints are put direct into this solution dry. They instantly turn yellowish red, but gradually turn to a warm red, and eventually to a brown. If they are removed whilst yet red, the colour on drying will be a splendid purple brown. If they are allowed to get brown the eventual colour will be an engraving black. With the sulpho-cyanide bath, the tone falls off in drying, with the hypo bath it darkens. The purity of the whites is wonderful, and there is no loss of half-tone unless the process is carried too far.

The prints have only to be washed, when they may be dried in any of the usual ways. The use of an alum bath to harden the films is not a necessity, even when the prints are to be dried on glass, as the gelatine is not so much softened that it will adhere, unless afterwards treated with alum as it is with the sulpho-cyanide bath. It is probably, however, advisable to use the alum bath for other reasons.

The use of the combined toning and fixing bath is a great saving of labour, and is, in my own case at any rate, a solution of all the troubles that I have had in working the paper. The only thing that can possibly be urged against the method is that there may be danger of sulphur toning, and of consequent damage to the permanency of the prints. I think, however, that there is very little likelihood of this. It is a thing that would not be likely to happen unless the bath were continuously worked, and it is impossible to work continuously in the way that I have described, even if it were wished. I have said that the prints must be put dry into the toning bath. The paper is thick, and it soaks up so much of the solution, that its quantity is very nearly exhausted at the same time that it has been deprived of the gold to tone. I find that about two grains of gold are taken up for each sheet toned.

A word as to preparing glass when prints are to be dried on it. French chalk is commonly recommended to give a surface to which the prints will not adhere, but it is probable that all have, at times, had the disagreeable experience of the obstinate sticking of the print after the most careful French chalking. If, however, the glass be once for all prepared in the following way, there is no further danger of sticking.

Perfectly clean sheet glass is taken, and there is applied to the surface a little of a solution of a few grains of bees-wax in each ounce of benzine. The glass is then polished, first with a clean cloth, and then with French chalk. The French chalk is polished away as completely as possible with a piece of dry flannel—plenty of elbow-grease is necessary—and the glass is then ready to receive the print. After the first print has been removed, it is not necessary to apply the wax solution again, only the French chalk.

I enclose you one or two bits of prints, so that you may judge of the kind of tone that I get. I may say that I



have enclosed prints, toned as I have just described, to remain, one half exposed, to a blazing sun for several weeks, and that there is no perceptible difference between the exposed and the unexposed parts. Of course this is no proof of permanence, but it is some evidence that the prints are not likely to be affected by light for some considerable time at least. I consider that one day in bright sunshine is roughly equal, in the matter of light, to about a year in a common room.



"Grease the surface of the glass," is the advice of the Editor of the *Journal of the Photographic Society of India* to those who lay by their objectives during the rainy season; and from some recent experience we think such advice may not be altogether superfluous in this climate.

From the article, which we reproduce on page 739, it would seem that recently-constructed lenses are more subject to surface deterioration than the older instruments, and foreign lenses are less enduring than the instruments of the best English makers.

We have in our possession a large reversing prism of the Daguerreotype period, the surfaces of which are covered with a multitude of minute fissures going into the glass something like fine diamond cuts. When the prism is left for a few weeks in a damp place, and is then transferred to a dry apartment, a minute ridge of saline exudation is found along the edge of each fissure, giving the whole surface the appearance of being ground. The glass is crown glass, and if the prism is washed and carefully wiped it acts well, and does not render the reversed image unsharp.

Of the making of detective cameras there is no end—in the brains of ingenious designers. Recently we described a camera which is sent up with a rocket and comes down, negative and all, in a Baldwin parachute; and now we have another curious suggestion—the "Soda and Brandy Glass Camera!" A large tumbler, such as is used for a mixed effervescing drink, is provided with a double bottom, space being thus found for the lens, the sensitive plate, and so on. When you wish to photograph, you fill up your "camera glass" as usual, and begin to drink. By regulating your imbibition of the fluid you can keep the bottom of your glass at any angle you wish, and proceed to take the photograph whilst in the very act of drinking. It may be well to add, for the information of teetotal photographers, that the patentee of the B. and S. Glass Camera claims that it can be equally well used when the tumbler part is filled with ginger beer or orangeade!

George Sala is so conscientious and careful a worker in his own particular line, that it is not at all surprising to find him an assiduous collector of photographs of people he has met, and places he has seen. He recently said, "I am indebted to a collection of some thousands of photographic portraits of famous people whom I have known, and views of many cities which I have visited,

which, parcelled by the hundreds, and secured by india-rubber bands, are arranged in their several pigeon holes." It is remarkable how a photograph assists the writer who has to describe or even allude to a place. We know a case of an author of a boy's story the scene of which was laid in India, who was highly complimented on the fidelity with which he described the scenery, and the costumes of the people. The author said nothing, but only thought the more, for he had never been in India, and had drawn his information entirely from photographs. In this case it should be added that the photographs were taken by an amateur, and were of a singularly unique character, giving a very vivid idea of the peculiarities of the people.

M. Marey has lately designed a fresh apparatus of extraordinary delicacy for the study of the successive movements of a body in motion. The images are obtained on sensitive paper which is unrolled as required, but to obtain sharp pictures it is necessary that the movement should not be continuous, but that there should be successive pauses for each pose.

The most notable thing of the forthcoming exhibition at Paris will, perhaps, be the great iron tower now being constructed under the direction of M. Eiffel, this work involving greater difficulties than was at first sight supposed, and being one which may probably lead to important results from a scientific point of view. The height is to be approximately one thousand feet, and the French engineering papers are pretty freely discussing the conditions of stability. Although the tower is only a skeleton of iron, it may have to resist a side thrust from the wind amounting to no less than a pressure of 3,284 tons. It is to be hoped that the photographic opportunities offered may not be wasted, as was the case with the great Giffard captive balloon at the last Paris Exhibition.

In the case of the Giffard balloon, the sole right of photographing was sold to a person who made no use of it. To charge a small sum for each camera taken up the Eiffel Tower will probably pay much better, especially as each photograph exhibited will incite fresh photographers into action.

*L'Amateur Photographe* devotes occasional chapters to suggestions with regard to patching up apparatus when the photographer is away from home. To stop cracks in the bellows, the dark slides, or the camera, you are first to rub white of egg—a material obtainable almost everywhere—on the place, and then cover with fluff scraped from that part of your coat which can best spare it. White of egg mixed with whiting and smeared over a plain glass, forms an excellent substitute for a focussing screen; while the same vehicle incorporated with the soot of a candle will serve to restore a worn black surface; even a broken objective need not make the tourist utterly despair, as if the broken parts are carefully fastened together by narrow strips of paper, cemented over the fractures by means of white of egg, it may still be possible to obtain sharp images. Of course gum may be used



instead of white of egg for all these purposes, and gummed paper—always obtainable in the shape of postage stamps—may do good service to a photographer when in the field. Capt. Abney has testified to the usefulness of postage stamps in cases of emergency.

Capt. Abney's course of Lectures on Light and Colour, at the Society of Arts (November 26th, December 3rd, 10th, and 17th) includes the following:—The production of colour, and its dependence on the kind of illuminant—Simple colours—The characteristics of colour—Interference colours. Production of colour by absorption—By fluorescence—The measurement of the luminosity of colours—The effect of the dilution of colours—Colour contrast—Colour blindness. Mixtures of colours—Impure colours—Effect of ground in water-colours—The measurement of colour in terms of a standard—The reproduction of the colour of a pigment. The action of light on pigments—The cause of change—The effect of sunlight, skylight, and artificial light—Rays effective in causing change—Moisture and oxygen necessary to cause change. Those readers wishing for tickets should write to the Secretary of the Society, John Street, Adelphi.

Queenwood College, Hants, has issued a neat pamphlet of thirty pages, illustrated by photographs, and giving the chronicles of the past summer term. The natural history notes and weather jottings are well put together, and the art prize list shows that photographs produced at the school meet with due recognition. The weather report from April to August is a dismal account, comparing most unfavourably with the previous year, and showing no exception to the general rule in respect of long-enduring rainfall and deficient hours of sunshine.

Owing to the facilities which photography offers for the reproduction of bank-notes, the Scotch banks have for some time past had their notes printed in the most glaring and startling colours. This plan has, however, not prevented forgery, and great alarm now exists across the border in consequence of the discovery of spurious £1 notes in circulation. Whether the forger is an expert in isochromatic photography, or whether the colours of the originals were badly selected, we are unable to say.

Greenwich Observatory is as jealously guarded as the Sultan's harem, and we fancy that a stranger who wanted to see the interior would have some trouble. In America they manage things differently. At the Lick Observatory, where is now the great telescope which is one of the wonders of the world, they have public receptions. We read of these receptions that they interfere greatly with experiments, and the writer goes on to say, "Probably few visitors are aware of the hindrance to astronomical work caused by their entertainment, although as a duty to the public the sacrifice is always cheerfully made." What do the Greenwich sages say to the notion of "entertaining the public" being part of their duty?

With respect to the Lick telescope, it may be mentioned that some difficulty was at first experienced with the long exposures. The usual plan is to keep the telescope pointed by hand, but it was found impracticable to move the immense mass of the Lick telescope with the extreme delicacy required in the operation, and the photographic plate is now mounted on double slides, one moving in right ascension, and the other in declination, and kept upon a star by means of a diagonal microscope attached to the plate.

## Reviews.

PROCEDES PHOTOGRAPHIQUES POUR L'APPLICATION DIRECTE SUR LA PORCELAINE AVEC COULEURS VITRIFIABLES DE DESSINS, PHOTOGRAPHIES, ETC. Par E. Godard. Crown octavo; 32 pages; paper covers. Price 1 franc. (Paris, 1888: Gauthier-Villars et Fils, Quai des Grands Augustins, 55.)

In this small but clearly-written hand-book we have concise directions for working the "Dusting-on Process" for the production of vitrified photographs, and we can readily believe that many of our readers will avail themselves of the instructions here presented.

L'HYDROQUINONE. NOUVELLE METHODE DE DEVELOPPEMENT. Par George Balagny. Crown octavo; 32 pages; paper covers. Price 1 franc. (Paris, 1889: Gauthier-Villars et Fils, Quai des Grands Augustins, 55.)

So much has been written and said of late regarding development with hydroquinone, and its advantages, that our readers will be glad to have a summary of the subject presented in so clear a way as M. Balagny puts the subject.

LA PHOTOGRAPHIE INSTANTANEE. Par Dr. J. M. Eder. Large octavo; 221 pages. (Paris: Gauthier-Villars.)

This magnificent and profusely-illustrated work is noticed on page 622 of our present volume.

## PHOTO-MECHANICAL PRINTING.\*

### ARTICLE II.—THE PROCESS MEISENBACH.

BY D. WINSTANLEY.

As it is in the lightest shadings of a picture that the more delicate gradations are most perceptible, it will be necessary, in order to get an agreeable rendering, that the disparity in the width of the obscure and transparent spaces shall be somewhat considerable, and at a guess I should say that their proportions should be as ten to one. There must, however, be a point—and not a very indefinite one—at which this disparity of width becomes an evil, and not a gain.

In fig. 2 we have a surface in which two systems of black lines of equal width cross each other at right angles, and leave spaces between as broad as the lines themselves. The whole square which is formed by this device is eight units in length on every side, and has, accordingly, an area of sixty-four square units. The clear parts, however, number sixteen only, and each is one square unit in its area.

It follows, then, that if we photograph a transparency through a screen like this, it is not the whole of it we photograph, but only samples of its parts taken with such impartiality as is afforded by equality of distance, but amounting in the aggregate to twenty-five per cent. only of the whole. If our black lines are twice as broad as are our clear ones, this small area of twenty-five per cent.

\* Continued from page 731.



becomes diminished to eleven per cent., and if our black lines are ten times as broad as are our clear ones, the actual quantity of our transparency visible through these latter will amount to only '826 per cent. of its total area, or less than one-hundredth part. It is evident that though the laws of probability indicate that such a method of selecting samples would in the multitude of cases give an aggregate which was sound, yet in the instance of any individual photograph discrepancies from the literal truth must not only exist, but in some way or

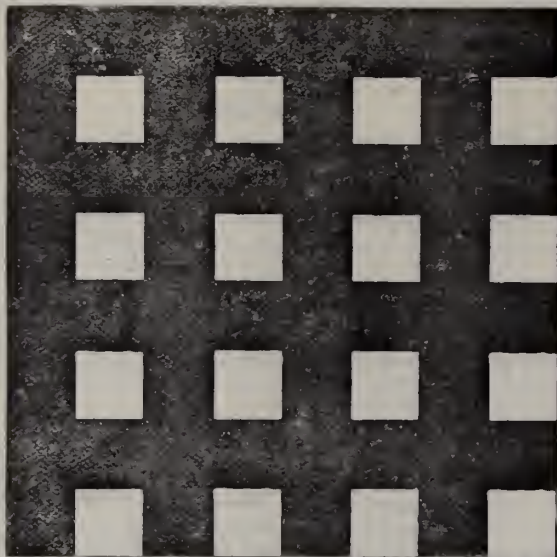


Fig. 2.

other must become apparent, and that the number of these discrepancies must also increase with the disparity in the width of the lines. Hence it follows that the wider our black lines, and the narrower our clear ones, the larger the number of half-tones we obtain, and the larger the number of appearances, hereafter to be considered, which are fictitious altogether, and unlike anything whatever in the negative. The process Meisenbach, however, is further complicated by the very thing which its author emphasises in his claims—the shifting of the one-lined screen. Suppose we have a transparency, and a one-lined

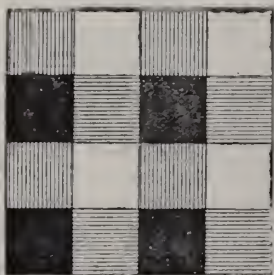


Fig. 3.

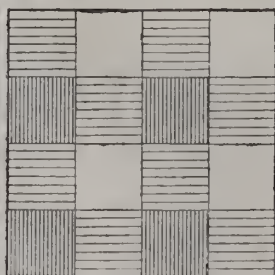


Fig. 4.

screen “joined face to face,” and ready to be photographed, and suppose ten seconds to be the time which will give the best result, and suppose further that five of these seconds have been given, the clear parts of the transparency, even where crossed by clear lines, will have been but half exposed, and on development would yield only half-tones instead of blacks. Suppose now that we shift the screen, and having, without altering the position of its plane, turned its lines in a direction at right angles with that they occupied before, and “joined it face to face” with the transparency again, complete the exposure we have given.

The results will be that the clear parts of the transparency will only be fully exposed where they have been twice crossed by the clear line screen, and they will be represented in the negative by areas of which one-fourth only are up to density, one-half of which are half-tone, and one-fourth of which are clear, as indicated in fig. 3.

The half-tones will be represented by areas of which one-fourth part only is in half-tone, one-half of which is quarter-tone, and one-half of which is clear, as indicated in fig. 4, whilst the dense parts of the transparency will be given in clear glass alone. This is certainly no faithful way of rendering the different shades of the original photograph employed.

I will next proceed to consider what the results of this rendering will be, and subsequently to show how the theory advanced in my former article may be more accurately applied.

P.S.—The matter of the preceding article and its immediate successor was written in May last, but for various reasons its appearance in print has been delayed. In the interval, as I gather from the PHOTOGRAPHIC NEWS of August 24th, “one of the Meisenbach Patents (No. 2156 of 1882) has been declared in the Official Journal of the Patent Office to be void.” This is the patent of the process under criticism now. The voidance of the patent I expected, but did not apprehend it would take place so soon.

(To be continued.)

## CHAPTERS ON ELEMENTARY PHOTOGRAPHY— A GUIDE TO BEGINNERS.

BY W. M. ASHMAN.

THIRTEENTH ARTICLE.

To be successful in photographing the interior of a room, or church, or any other public building, the exhibition of much skill is seldom required, especially if a moderate amount of well-diffused daylight pervades the place, and the dimensions are not too circumscribed. It should be remembered that the human eye lacks the power of grasping the whole of such a view at a glance, especially when very close to it; but this incapacity is scarcely felt by us under ordinary circumstances, because of the facility with which, in their normal condition, they can accommodate themselves to the different vertical planes in which the objects lie. That is, our natural lenses can only focus one comparatively small point at once, but that focus is involuntarily shortened or lengthened as rapidly as our thought can travel to another plane. Therefore, it is only on the ground-glass of the camera that we can see the whole completely and sharply defined, and so judge of its real value as a picture. On the other hand, our eyes bear one striking resemblance to the type of lens usually employed in the photographing of interiors, in that they subtend the widest angle in a horizontal plane of any optical contrivance known. We can really cover more than 180° in that direction. However, an ordinary wide angle rectilinear lens is quite sufficient for general photographic purposes, and, even with that, the perspective of objects near the sides of the plate often seem to be somewhat forced and unnatural. When taking an interior view of a room, it is essential that the camera should be perfectly level, and at such a height from the ground as will bring the chief objects fairly in the field. For ornamental or painted ceilings, it is a good plan to fix the camera to its stand vertically by means of two pieces of wood screwed together at right angles by a strut fastened across, from side to side. The arrangement is like the letter L; the lower part being screwed to the tripod head, the upright serves to carry the camera, lens upwards.

Camera stands are now made with folding tops; and it may be mentioned that this contrivance is invaluable for copying objects lying flat upon the floor, in which case the camera is simply turned with the lens downwards.



It is generally desired that as much as possible be included in the view of interiors, and as space is most frequently limited, the amateur has, perforce, to submit to some inconvenience in order to get back sufficiently far from the centre of the room. A doorway into hall or passage, or into some other room, will often allow of a little longer range, by accommodating the legs of the tripod; then with a wide angled lens, which will give good marginal definition of objects within an angle of about  $100^\circ$ , a good representation of the interior can be secured. The "Steinheil wide angle lens" ranks among the best for this class of work. It is better to focus the objects in the rooms by the fullest amount of illumination one can command, and with the largest aperture the lens will work with, and, having found the two extremes where sharpness falls off, to select a point rather nearer to the camera than mid-way between those two, and rely upon that as the best general focus for the whole. The laws relating to equivalent foci show that the introduction of a smaller stop adds more to the back of increased depth than to the front. It is usually admitted that to work with a smaller stop than is really necessary endangers the brilliancy of the picture by inducing a tendency to flatness.

Returning for a moment to the subject of halation, which, it was stated in the last chapter, might be avoided by adopting the precaution of backing the plate with an opaque material, it is frequently possible to modify the defect by subduing strong contrast as much as practicable. This can be done by diffusion of light through curtains, &c., which diminishes the major light and increases the minor, so rendering the efficiency of each more equal, and reduces the chances of halation to a minimum. If in the above case of an interior there is a window unshaded by blinds, recourse must be had to a backing upon the plate. It should be noted, however, that this troublesome blurring around the highest lights is almost, if not entirely, absent in the case of the roller slide, where paper negatives or stripping films are employed. Beginners as a rule would scarcely undertake to venture upon such a process as that of staining the films of their dry plates before exposure, and in the light of the dark room, and subsequently drying them carefully; but there is a plan by which, with the aid of red or orange dyes properly applied to the plate, this same halation may be done away with. Another method is to coat the back of the plate with a thick collodion coloured strongly by orange dyes as above; but this has proved insufficient where the high-lights are very strong.

When all the details enumerated have been attended to, the last thing to remember is that the curtaining and other modification and reduction of the illumination will make a longer exposure necessary, and as halation is increased by such prolongation it will be seen that it is far better to back the plate, and so run no risk.

The same may be said about the use of very rapid and thinly coated plates, which also increase that risk, unless they, too, are prepared in like manner when uncurtained windows are to be photographed.

As living models do not often form part of such pictures, it matters very little if the exposure be three minutes or thirty. With the lens mentioned, and the largest stop, and a plate of medium rapidity, the exposure in the best part of a fine winter's day would be about five minutes, the subject being the interior of a fairly good lighted room.

Interiors of churches have to be taken as they are found, for it is of course impracticable to modify the light by curtain, &c. The only thing to be careful about is, that the best time of the day is selected, when the light is strongest upon those subjects which require to be more clearly portrayed, stained glass often forming the chief ornament, and so often required to be represented in the picture, that the precaution of backing the plate becomes a necessity. In how few collections of such subjects that are offered for sale has justice been done to either archi-

tect or designer, in coloured glass, in respect of the windows and the carving around them?

Photographing the exterior of a building is very simple. In this case the source of light should be behind the camera; or, better still, a little on one side, but on no account in front. Particularly interesting details of architecture sometimes require the light to be quite on one side to properly accentuate them in the picture. The photographer can then, if necessary, form a screen to the lens on that side by standing there at the moment of exposure, being careful not to obstruct any of the view. A portable symmetrical of moderately long focus is, perhaps, the best form of lens to employ where sufficient distance can be obtained, and if there are no trees or live models included in the picture, a slow landscape plate will be as useful as one of greater sensitiveness. But in cases where foliage forms a prominent part of the subject, or figures are introduced, then rapid lenses and rapid plates are desiderata. Suppose that an ordinary dry plate is used the speed of which is about  $18^\circ$  (Warnerke), that the time of day is 2 p.m. in the middle of the month of November, then, with the lens recommended stopped down to about  $f_{32}$ , an exposure of three to four seconds in a good diffused light would prove very nearly correct. If the photographer is so placed as not to be able to fix the camera where it will be raised a few feet above the ground, advantage will have to be taken of the rising front to adjust the image properly upon the ground glass, it being always understood that the camera is perfectly horizontal, or otherwise all vertical lines will be bent, and the picture spoiled.

Passing on to another subject, we will take the case of a stone bridge over a river, say that at Richmond across the Thames. Our point of view would, in all probability, include a bit of the river in the foreground, and a portion of the bank with foliage near on one hand, and distant in the centre and on the other. If a boat can be tied up to the towing path so much the better. The same optical appliance as that used in the previous instance will answer our purpose, but as we are able to get further off, and there are no long vertical lines to be distorted by the use of a single landscape lens, we can employ one of these with a longer focus. Keeping the camera level, we may use the swing-back with advantage, especially when important objects are much nearer to us on one side than on the other, the swing being from side to side, and not from top to bottom.

Here again also, we must be careful to select the time of day when the sun is in the right position with regard to the camera. As a guide to exposure in cases of this kind, where there is an unobstructed light, the time required would be from that of a slow drop shutter to three or even four seconds, according to choice of lens made, the rapidity of the plate, the light, and the size of the stop selected. In spring time an exposure on a subject of this kind under the conditions named should not exceed one second, stop  $f_{32}$ . During the summer months the exposure in the middle of the day would be about half a second, and before 8 a.m., and after 5 p.m., the time required would be more than doubled.

In winter in this country the light is only quick for a short time in the middle of the day.

## EXPERIENCES OF A PORTRAIT PHOTOGRAPHER.

BY A. BOGARDUS.

I ONCE kept a fine music box near my camera (the sitting then required some twenty or twenty-five seconds). As I opened the camera I touched a spring and the soft music commenced. I thought it a good idea and would be pleasing to the sitter. Now, see how differently it affected some folks. I was making the picture of a portly German; the music accompanied the sitting, but he said nothing about the music. After the plate was pronounced a success, he said he would also have a large



picture made, and decided on a 17 by 20. As I was ready to remove the cap, he said, "All right—start der music!"

My next sitter was a lady, and for her the music box was also used. As soon as she could speak, she said:—"Oh, why did you do that? It made me so nervous I know the picture is spoiled!" No "sauce for the goose is sauce for the gander" in photography; rather "what is one man's meat is another man's poison" more appropriate. One man wants his picture with head and shoulders only, not to show below the second button on his coat; the next man says he don't believe in cutting a man in half—he wants the full length, feet and all.

I once had a man bring his pictures back because all of his five fingers did not show. His hand was partially closed, and rightly; but he said he had four fingers and one thumb, and did not want to look deformed. He wanted them all in sight, and straight at that. A young man is having a three-quarter length picture standing. He is posed with light cane in his hand—an easy and stylish pose. His intended said it was perfectly lovely! Another young lady saw the picture, and her first expression was, "What a looking dude!" Now these conflicting ideas bother a man very much, and he finds it necessary to get a clue as to what kind of taste he is trying to gratify.

I once made a Daguerreotype of a man who was to call for the picture. His wife and daughter came to look at it and they said it was perfect; but when he called he said it looked like the devil. I told him I had never seen that personage and could not say as to the likeness, but sometimes a resemblance ran all through families. When I was green I used to insist on doing what I knew to be right and in good taste; but I found it paid better to give the sitter what he wanted and was willing to pay for. If he was over six feet high and wanted full length—fool length—he got boots and all. A lady sits with lace shawl nicely arranged on her shoulders; another criticises it by saying, "was she such a fool as to wear that thing?"

We read of people being colour blind. I certainly think there are people likeness blind; they cannot tell a likeness of their most intimate friend. The father of a family for whom I made many pictures could not tell a likeness; the wife and mother said he could not tell which was the picture of any one of his three boys.

A reader of the *St. L. & C. P.* says he is pleased to see some jokes interspersed with photographic reading. The writer did try to get in a small one once, but it fell flat; nobody ever saw it. Jokes are very high and scarce this season; in fact the politicians have appropriated all the stale ones. If any reader hears of a good fresh one, enclosed find two cents to mail it to the *St. Louis Photographer*.

## VIENNA INTERNATIONAL PHOTOGRAPHIC EXHIBITION.

### AWARDS TO ENGLISH EXHIBITORS.

ALTHOUGH the exhibition included four large rooms in the museum, yet the space was inadequate for the hanging of all the pictures sent, so that the Club of Amateur Photographers withdrew nearly all their own pictures.

The executive committee placed at the disposal of the jury no less than 167 medals. Professor Fritz Luckart acted as foreman of the jury.

Much regret has been expressed that though England contributed about a quarter of the pictures, she was not represented on the jury. Till the last moment, however, there was every appearance that there would be next to no English pictures; and when, at the last, England suddenly took a foremost place, it was too late to make the necessary arrangements.

In the section for Scientific Photography 20 vermeil medals were awarded, 2 to Englishmen. In Section I, there were 62, English exhibitors carrying off 27—or nearly half. Of the 74 bronze medals, 15 were won by Englishmen. Of the 38 diplomas of honourable mention, 5 were awarded to Englishmen. Marion and Co., London, must be mentioned as not being in competition, and therefore not able to receive the recognition they merited.

*Large Silver Gilt Medal.*—H. P. Robinson, Tunbridge Wells; Harry Tolley, Nottingham.

*Small Silver Gilt Medal.*—George Davison, London; Henry Stevens, Addlestone; A. Diston, Leven; W. W. Winter, Derby.

*Large Silver Medal.*—G. Bankart, Leicester; A. Dresser,

Springfield; R. T. Hirst, Huddersfield; Susan Hodgson, Alderley; S. Lange, Liverpool; J. B. B. Wellington, London; A. Pringle, Bexley Heath; W. T. Byrne, Richmond; F. Sutcliffe, Whitby; Werner and Son, Dublin; J. West and Son, Southsea.

*Small Silver Medal.*—H. W. Banks, Kingston; M. J. Harding, Shrewsbury; H. T. Houghton, New Brighton; W. J. Nox, London; J. Rainger, London; A. Waterhouse, Calcutta; E. H. Baldry, Grasmere; D. Hodges, Lytham; Symonds and Co., Portsmouth; Wilson and Co., Aberdeen.

In addition to these were 15 bronze medals and 5 diplomas.

English exhibitors' pictures from the Vienna Exhibition will be returned to them, free of charge, through Messrs. Schenker and Co., 64, Morgate Street, London, E.C.

## THE MOUNTING, FRAMING, AND HANGING OF PHOTOGRAPHS.

WITH the oncoming of the season when the ripe fruits of the camera are ready for the annual exhibition, the grave query comes from the ranks of the amateur and professional, "How shall we mount our photographs so that their good qualities may show to the greatest advantage when hung upon the walls of the exhibition rooms?"

To judge from the many exhibitions we have seen, the conclusion must be reached that as far as mounts are concerned, "Motley is the only wear." The blues, the greens, the reds, the purples, the blacks, the yellows, are made to do service indiscriminately, without any regard to the damaging effects they produce upon the photographs themselves.

It is said that the primary object in mounting and framing a picture is to isolate it from surrounding objects, so that the attention of the spectator may be directed especially to it to appreciate its artistic merits, and that the best service a mount and frame can do for the picture is not to interfere with its effect; but we are assured from experiment that there can be no neutral ground in the action of accessories. If the mount and frame do not enhance the good qualities of the photograph, they do positive injury by their presence. Every one knows of what value to the artist is the knowledge of simultaneous contrast of colours. To the photographer it is equally important—we ought to say, equally essential—to know the effect of the juxtaposition of light and shade in order to produce certain definite effects. All our knowledge, we are told, is relative; so light and dark are only relative ideas—like great and small, hard and soft. We cannot judge of anything absolutely—we judge only by comparison. The dimensions of a certain thing cannot be truly estimated unless we possess some fixed standard as a guide; and the same object is soft or hard, according to the power of muscular resistance. And so the light of one object may be comparatively dark when placed in relation with the light of another object.

This latter fact can be easily demonstrated, so as to show that our errors of judgment are very largely responsible for our mistakes in decision. A piece of grey paper out in the full blaze of the sunlight is in reality much lighter than a pure white sheet in a darkened corner of a room, yet we do all unhesitatingly declare from *a priori* judgment that the sheet is white and the piece grey.

An object of a certain tint always appears darker when placed in proximity to a much lighter object, and *vice versa*. If we take, for instance, a medium grey, and place it upon two different grounds—one of which is lighter, the other darker, than the superimposed grey itself—its appearance will be strikingly different in each case. Upon the lighter ground it will look much darker, while upon the ground darker than itself it will seem much lighter in tone. Anyone can easily prove the truth of this by cutting two circles of the same grey piece, and placing them upon the two grounds. The different effect is so great that it is impossible to realize that both circles are identical in colour until we place them both on the same ground.

Now, this change of brightness by contrast with the ground is precisely what takes place, although the spectator is unconscious of the operation, when a certain tone of a photograph is brought into contrast with a mount darker or lighter than itself. Not only is the character of the photographic tone changed, but the whole perspective is really altered. We know this last remark will be challenged, but we think it may be practically demonstrated, as well as theoretically proved. We have materially changed the character of the perspective by change of mount.



For instance, in a landscape photograph, the distant mountains are rendered much lighter in tone than the foreground. Now, it will be readily seen that this tone may be deepened or lessened by the juxtaposition of a mount whose tone is lighter or darker, and the distance will approach or retire accordingly.

When we look at an object, we do not fix our eyes steadily upon any one part, but the vision wanders over the whole field. When we turn the eye from a dark surface to a light one, there is a superposition of impressions upon the retina; the light portion of the new impression falling upon that part which had previously received the dark portion is made more intense because that part of the retina is less wearied than the part acted upon by the light of the first impression. We have, perhaps, gone too far into the detail of the subject in a practical paper, but we were anxious to show that the character of the mount was not a question to be left to mere individual fancy. There is another factor in the case. We have tried to show how a mount of a tone darker or lighter than the colour of the photograph influences its character. It is equally true that the special colour of the mount also acts injuriously or beneficially upon the photograph. We shall be brief, and only refer to the physiological effect of colours when placed in juxtaposition; how that red, for instance, will give a comparative greenish cast to the tones, and yellow a bluish shade.

It is really worth trying the effects of different coloured mounts upon the same photograph. A yellowish white mount, for instance, when used in connection with a landscape photograph in which the distant atmospheric effect is represented by a perfectly neutral grey, gives a more delicate, bluish, ether-like appearance to the distance; while a grey mount, although inclined in tone to blue, does not show nearly so fine an effect. Now we are sure anyone who values the effect of atmosphere in his photograph would look to the character of the mount. A purplish grey tone in a photograph will be found to look towards bluish when the mount is whitish yellow.

We have not touched upon effects of the various hues of colours which the card manufacturers present in their stock, believing that all the photographic tones may be perfectly accommodated with greys and buffs. We think, too, we have said enough to convince anyone of the necessity of the wedding garment in the colour of the mount, if he is desirous of having his photographs enter the kingdom of art.

Now a word on framing and hanging, and we are through. The most we would ask of a frame would be to be quiet, and not to blazon in scrolls and gingerbread twists its vulgar pretensions. Flat square frames with modest mouldings are most appropriate; but, beseech you, keep clear of plush or velvet mats, or puckered silk and gold frostings, and rustic logs and cross-ties, and bunches of kindling wood.

In hanging, the only suggestion we shall venture is to allow more space between the exhibits, so that the frames are not in visual agglomeration.—*From the American Journal of Photography.*

## Patent Intelligence.

### Applications for Letters Patent.

- 16,224. JAMES LYON, Engineering Department, Cambridge, for "An Instantaneous Photographic Shutter."—November 9th, 1888.
- 16,258. WILLIAM OLDHAM, 23, Southampton Buildings, Middlesex, for "An Improvement in the Method of and Materials or Compound Employed in Developing Photographic Pictures or Images."—November 9th, 1888.
- 16,537. WILLIAM OLDHAM, 23, Southampton Buildings, Middlesex, for "An Improvement in the Method of and Materials or Compound employed in Developing Photographic Pictures or Images."—November 14, 1888.
- 16,556. HERBERT CHARLES NEWTON, 6, Bream's Buildings, Chancery Lane, for "Improvements in Apparatus to be used in Lanterns for Projection."—[Complete Specification.]—November 14, 1888.
- 16,575. WALTER HEATH WELSHMAN, 52, Tenby Street North, Birmingham, for "A Corner Piece for Photographic Frames."—November 15th, 1888.

Patents on which the Fourth Year's Renewal Fee has been Paid.

14,951 of 1884. L. WRIGHT and Another.—Oxyhydrogen Lantern Microscopes.

### Specifications Published during the Week.

3,779. JOSEPH LONDON BERRY, of 43, Cardiff Street, Aberdare, in the County of Glamorgan, Photographer, for "Improvements in or connected with Photographic Cameras."—Dated March 12th, 1888.

Berry's gun-stock support, already described in the PHOTOGRAPHIC NEWS.

The claim is:—

The form of head of holder or stock with the manner of affixing any camera to it with a receptacle for the ball of any pneumatic shutter in it, also the manner of actuating the ball by means of a piston furnished with springs and a trigger operated in the manner of firing a gun instead of the ball being squeezed by hand as hitherto.

1510. RUDOLPH KRUGENER, of Bockenheim, near Frankfurt-on-Main, Germany, for "Improvements relating to Photographic Cameras."—[Specification and drawings next week.]

## Correspondence.

### THE USE OF ARTIFICIAL LIGHT.

SIR,—With reference to the first article in your last week's publication, Dr. Meydeubauer states: "The best means to produce soft shadows (in photographing the interior of buildings) is by moving the artificial light from place to place." Do not you think that two lamps, fixed in ground glass globes, and placed about a yard from and on each side of the camera, would give still better results?—

Yours respectfully,  
E. N. ROFF.  
17, St. Jude's Place, Manningham Lane, Bradford.

## Proceedings of Societies.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The usual weekly meeting was held on the 15th inst., A. PRINGLE in the chair.

A. HADDON exhibited a photograph he had taken by moonlight, in which the telegraph wires, sixty yards distant from the camera, were plainly visible; one hour's exposure had been given.

J. P. CEMBRANO asked the cause of some spots on some collodio-bromide plates he handed round. The emulsion had been filtered three times through cotton-wool.

The CHAIRMAN was of opinion that the spots had been caused by dust, or some particles of the cotton-wool through which the emulsion had been filtered.

S. G. B. WOLLASTON preferred washed wash-leather for filtering purposes.

A question from the box was read: "Can any member give the formula for preparing a toning and fixing bath, for silver prints, which will retain its properties for a month or so?"—No definite information on this subject was elicited.

Another question was read: "Suppose you want to enlarge from a half-plate negative, and you have no condenser the requisite size, how would you arrange the light, and what kind of light is the best: daylight is out of the question?"

J. TRAILL TAYLOR suggested using colourless opal glass with three or four lights behind, the negative being moderately close.

A paper was then read by E. R. SHIPTON, "Cycling in connection with Photography."

At the conclusion of the paper J. B. B. WELLINGTON said it was most important that the carrier should not be rigid. He suggested that the apparatus should be attached and hung from the carrier by several spiral springs. He preferred a detective camera when on a cycling tour, as the unpacking and packing up of the apparatus took up so much time.

S. G. B. WOLLASTON had commenced cycling in 1857, the cycle he then rode weighing 260lbs. He first carried his photographic kit strapped to his back. The camera and slides can be safely carried attached to the spring of the seat of the cycle. It was his custom to thoroughly dust and shake his dark slides before starting on a journey; to this precaution he attributes



the fact that he experienced no trouble whatever from dust. He preferred films to glass.

J. J. BRIGINSHAW, referring to the conveniences cyclists possessed in the matter of hotels, thought similar advantages might be secured to photographers, when touring, who were not cyclists.

J. PEASGOOD was of opinion that Mr. Shipton had over-estimated the speed that a beginner would attain with the weight of the photographic apparatus attached. He believed it would be found to lessen his ordinary speed to one half.

E. R. SHIPTON, in replying to the various speakers, said he considered the L form of carrier a very good one—this was quite rigid; he, however, would allow some latitude of movement. This might be obtained by a spiral spring fastened on to the axle of cycle, which took the weight of the carrier and luggage. A detective camera would certainly be found useful in tours where a crowd might prove troublesome. He generally carried a whole-plate camera—which, with lenses, dark-slides, &c., weighed about 84 lbs. Had given films a good trial, but had abandoned them, and gone back to glass plates. He advised packing the apparatus in a good leather case that would keep out the wet.

C. MAVITTA, of Birmingham, exhibited a camera stand with sliding legs, suitable for cyclists, the tripod head being attached by traversing set screws. Although very light, it was perfectly rigid when set up.

A hearty vote of thanks, proposed by the chairman to Mr. Shipton for his interesting and able paper, was warmly responded to.

J. H. Keene was elected a member of the Association.

#### NEWCASTLE-UPON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

THE ordinary monthly meeting was held in the Mosley Street Café, Newcastle, on Tuesday evening, the 13th inst., H. R. PROCTER in the chair.

The minutes of last meeting were read, and three new members elected.

THE CHAIRMAN opened a discussion on "Stereoscopic Photography." Over fifty beautiful glass stereoscopic slides (several of them the work of members) were shown, also four different forms of stereoscopies, and a novel sliding printing frame, for use without cutting the negative.

THE CHAIRMAN announced that Mr. Bellsmith, of the Eastman Dry Plate and Film Company, London, would at the next meeting of the Association, on December 11th, give a demonstration upon American stripping films, transferotype paper, and bromide enlarging.

#### COVENTRY AND MIDLAND PHOTOGRAPHIC SOCIETY.

A SPECIAL meeting of this Society was held on Tuesday, 13th, to witness a demonstration, by H. S. Bellsmith, on the various processes connected with the working of the American films, transferotype paper, and enlargements, and contact prints on bromide paper. He also explained the working of the Eastman roller slide and the Kodak camera; the questions asked by those present showing how keen was the interest taken in all the various stages.

The meeting closed with the customary vote of thanks to the lecturer, who suitably responded.

#### CAMERA CLUB.

At the November lantern evening, on the 15th inst., a large number of slides was exhibited of every description of make and subject, and prepared with every variety of known developer. About 200 were put through the lantern, including some splendid Woodbury slides, by George Smith, of country hedgerow flowers; Gloucester Cathedral interiors, by Evans; interesting views of Rye, by Charles Whiting; illustrations of Vesuvius, by Dr. Anderson; pictures of Baldwin descending with his parachute, by R. Abrahams; and a very complete series representing Indian life and architecture, by G. G. Butler. Slides by Surgeon-General Ranking were also exhibited, both rapid chloride and gelatine bromide work; and Major Nott lent some of his own pictures of animals, as well as two splendid sets of albumen slides and Notman's wet collodion slides. Other slides, showing instantaneous work from Kodaks and other hand cameras, and landscape studies at home and abroad, were shown by Messrs. Harrison, Cunningham, Hudson, Howlett, Robertson, Grimshaw,

Elder, Bond, Ferrero, Barclay, Stroh, W. Clarke, Dresser, and Davison. A salient feature of lantern slide shows is the number of hydroquinone-developed plates exhibited, this developer, at any rate amongst members of the Camera Club, being very generally used for this particular purpose.

The subject on Thursday, November 29th, will be "A Lesson in the New Cold Bath Platinotype Process," by W. Willis; meeting at 8 p.m.

#### IPSWICH PHOTOGRAPHIC SOCIETY.

THE monthly meeting of this Society was held at the Art Gallery, Ipswich, on Tuesday evening, the 13th inst., the president, J. DIXON PIPER, in the chair.

William Vick, J. Reynolds, and H. C. Gooding were elected members.

A. H. CADE gave an interesting demonstration on "Printing and Development in Carboin Pigments," and successfully developed several prints on opal, paper, glass, &c.

C. WIGGIN exhibited several bromide prints, an enlargement, and some transparencies.

A patent lamp for flashing magnesium was also shown.

#### HASTINGS AND ST. LEONARDS PHOTOGRAPHIC SOCIETY.

A NUMEROUSLY attended meeting of the above Society took place on Monday last, when the Rev. A. B. COTTON gave a most interesting lecture on "Detective Cameras," illustrated by the lantern, with slides prepared from negatives produced by the use of different hand or detective cameras.

The exhibition concluded with portraits of Sir Auchitel A. hburnham, the Mayor (Mr. Councillor Stubbs), and Mrs. Stubbs, kindly lent for the occasion by Messrs. Bradshaw and W. Thomas.

The proceedings terminated with a vote of thanks to the Chairman.

The next meeting will be on the second Monday in December, when a paper is promised by T. J. Northy, on "Photography at Home by the aid of the Flash Light," with demonstrations.

Any persons wishing to join this prosperous Society should send in their name to the honorary secretaries.

#### FORMATION OF THE HUDDERSFIELD PHOTOGRAPHIC SOCIETY.

IN response to a circular letter which had been addressed to some of the leading photographers (professional and amateur), a large and influential meeting took place in Huddersfield on Wednesday evening, November 14th, at the Queen Hotel.

Dr. J. E. FOSTER having been voted to the chair on the motion of T. K. Mellor, seconded by F. W. Mills, said: Some few weeks since, I was asked to subscribe my name to the letter which you have all received convening this meeting. I readily acquiesced, feeling that in a large town like Huddersfield there were sufficient interested in the art-science to form an influential society, and that it would be mutually to our advantage to do so. As amateurs—those of us as are such—we must be pleased to see so many professional photographers present this evening, as I am sure we shall derive much benefit from their co-operation in this undertaking; and on the other hand, it is possible they may learn something from our failures. Be this as it may, I hope we may see our way to form a society wherein we shall have opportunities of pursuing our work in an amicable and social manner to benefit of all concerned.

J. E. SHAW then proposed, and C. K. MELLOR seconded, a resolution that the Huddersfield Photographic Society be now formed, and that the annual subscription be 10s.

This was carried unanimously.

A provisional committee was appointed, consisting of Messrs. Foster, Mellor, Mills, Brierly, Charlesworth, and Young, to draft rules to be submitted to the members present for confirmation at a meeting at the Queen Hotel, on Wednesday, November 28th, at eight o'clock, and to make such arrangements or inquiries as they thought fit for a permanent home for the new society.

On the motion of F. W. MILLS, seconded by E. W. DEBENHAM, Hedley M. Smith, 15, St. John's Road, Huddersfield, was elected hon. secretary.

#### GLASGOW PHOTOGRAPHIC ASSOCIATION.

THE second general meeting of the session was held in the Philosophical Society's Rooms on the 15th instant, President WILLIAM LANG, Jun., in the chair.



W. MacLean, J. Brandebourg, Comrie Smith, G. G. Napier, and William C. Nicol, were admitted as members.

The SECRETARY exhibited a positive which, he stated, was obtained by accident direct in the camera. The plate had been under-exposed, and was carelessly laid aside, no precautions being taken to keep the light from it; on removing the plate from the developer two hours later a perfect positive was found developed on it.

Some discussion ensued, but the matter was finally held over till the next meeting to allow of similar accidentals being brought forward for comparison.

Mr. LANG then explained the working of the Eastman roller slide and detective camera (the Kodak), and afterwards successfully demonstrated the stripping of the film negative. He attributed his universal success in stripping to the use of hydrochloric acid in the hot water.

The PRESIDENT next informed the meeting that the council had bought a Sciopicon lantern for the use of the Association, and

R. B. M. STEWART read a short paper on the result of his experiments with some new lantern plates which Messrs. Thomas had sent down to the Association. These results were shown on the screen, and also a number of slides prepared on their plates by Messrs. Thomas. These fully proved that the plates were capable of producing the purple tones claimed for them.

A number of very fine bromide enlargements of scenes in Norway were shown by John Stuart. The original negatives were  $8\frac{1}{2}$  by  $6\frac{1}{2}$ , and the enlargements were about three feet. They were very much admired by the members for their clearness and richness.

There was a large attendance of members at the meeting, which closed with the usual vote of thanks to the Chairman.

#### DERBY PHOTOGRAPHIC SOCIETY.

THE members of this Society accepted an invitation from the members of the Notts Amateur Photographic Association to visit them at their rooms on Monday evening, November 12th, their reception being most cordial.

On November 13th, the usual monthly meeting was held, when most of the evening was spent in discussing the new rules which the Society are making.

T. SCOTTON handed round for inspection a number of very fine enlargements and contact prints.

Mr. BOURDIN showed a very fine platinotype print made on Chinese paper by an amateur friend in Paris.

On November 19th, a special meeting was held to hear a lecture by R. KEENE on the "History and Practice of Photography," with illustrations, showing prints, &c., by the various photographic processes; and a large number of very fine lantern slides by Messrs. Pringle, Bothamley, Wellington, and Keene, illustrative of the lecture, were exhibited upon the screen.

#### EDINBURGH PHOTOGRAPHIC SOCIETY.

THE twenty-ninth annual meeting was held in the Professional Hall, 20, George Street, on November 7, the chair being taken by the President.

The following gentlemen were elected ordinary members:—Thomas Clark, Richard Cunningham, Henry Paton, M.A., and J. T. Richardson, M.D.

The Secretary and Treasurer then read their respective reports, which were adopted.

The Society next proceeded to elect the office-bearers for 1888-89, as follows:—

*President*—Hyppolyte J. Blanc.

*Vice-presidents*—Dr. T. W. Drinkwater, F.C.S., and W. T. Bashford.

*Secretary*—Hugh Brebner.

*Treasurer*—James McGlashan.

*Curator*—Herbert W. Bibbs.

*Council*—William Dougall, William Forgan, G. G. Mitchell, T. Wardale, A. H. Baird, and W. B. Mitchell.

SYDNEY KEITH then read a paper on "A Trip to Tangiers in 1888," illustrated with a series of transparencies from negatives taken by himself, Mr. Turnbull managing the lantern. In the course of his paper, the reader said:—"Last winter I read two very interesting books—namely, 'A Trip to the Great Sahara,' by a Cockney, and 'Tartarin of Tarascon,' by Alphonse Daudet; and ever since I have felt a great desire to visit the land of the

Moors; so it occurred to me that I would spend my holidays by having a peep at scenes entirely out of my former experience, and perchance I might bring back a few photographic sketches worthy of being represented at this meeting. But as 'the best laid schemes of mice and men gae aft a'gae,' I found it one thing to say I'll do this and that and bring home sketches, and another thing to get them without infringing on some of the religious observances of the natives. A friend and myself sailed for Gibraltar. There is little to relate regarding our trip out. Gibraltar being under martial law, they are very strict regarding photographing, sketching, &c. However, I have one or two which may prove interesting, but for the want of a secret camera, one might have done some more valuable work. But forward to Tangiers, our goal. We got on board a steamer, and started across the straits, which takes from three-and-a-half to four hours to accomplish. At last we arrived in the Bay of Tangiers, and having cast anchor, were assailed by numerous Moorish boatmen, clamouring for patronage to take us ashore. We were landed amid much cry and little 'oo, and having passed the Customs, which is a very primitive one, consisting of two or three sage-looking Moors seated on stones at the gate of the town, who request you to open your baggage with all possible speed and hook it, which we did, and being guided by a Moor named Salem, we soon reached our hotel. The Moors are a fine race of men, and so long as not interfered with in religious matters are quiet and inoffensive; but the reverse if you happen to offend them, as I well know, for one fine morning I had taken a fancy to photograph a certain well and its surroundings, which I had viewed with an artistic eye. I quietly took my position, and set my camera, when all at once a wild hullabaloo—screaming, shouting, dancing, and clapping of hands—warned me to beat a hasty retreat, which I did, in pretty quick time, not liking the appearance of the fierce rolling eyes of a group of sturdy black fellows. The reason for this was, the well was situated within the precincts of a mosque, and to make a picture of it was sacrilege. One is very much surprised at the quantity of donkeys, I should think as many as there are people; but what the Moor would do without a donkey it is hard to say. Those who come into the market simply hobble their donkeys, and leave them in the soko or marketplace until they have transacted their business, and come back and find them as they were left. Their principal market day is Sunday, their Sunday being our Friday, and the great sight is to see the soko on that day. Here there are types of all the different tribes of Africa, and some queer-looking fellows I saw. I cannot enumerate them all, but one particular group, from the far interior, Fauatics, the like of which we never see in this country, were squatted together, perfectly nude, except the usual skin round their loins, and as if carved out of black marble, their arms covered with beads, rings through their noses, &c. I was advised not to attempt to photograph them, or I should have fared worse than at the well; however, the crowd was so great that there was little chance of putting a camera up, so we pushed on to see the caravans from the desert, with heavily laden camels, of which I saw about a hundred altogether, groups of serpent charmers, and many other sights too numerous to mention. The scenery outside of the town is fine, flowers in great profusion, geraniums growing in hedgerows, bamboos, cork trees, aloes, cactus, &c." Mr. Keith closed his paper by insisting on the necessity of taking a secret camera.

#### Talk in the Studio.

STARTING A PHOTOGRAPHIC BUSINESS.—Mr. Commissioner Kerr, the President of the City of London Court, had before him last week an action, in the course of which an interesting description of the starting of a photographic business was given. The proceedings were instituted at the instance of Miss Emmeline Smith, of 67, Bartholomew Close, E.C., who sought to recover bouses at the hands of the defendant, Mr. Joe Parkin Mayall, photographer, of 109, Cheapside, E.C.—Miss Smith, in her statement, explained that her claim was for  $4\frac{1}{2}$  week's bonus at 10s. per week. The defendant engaged her for a month certain, to work up a new photographic business which he was desirous of starting in Cheapside. He promised to pay her £1 per week from the commencement, provided she worked the business up successfully. If it was not a success he was to close the



shop at the end of four weeks, and then she was only to be paid 10s. per week for her services. So that it entirely depended upon her exertions as to whether she made the business, and with regard to its future continuance. Feeling sure she was quite competent to work up the business and make it a going concern, she accepted his terms. She worked for the four weeks and did her best. At the expiration of the time she enquired of the defendant whether he had any intention to close the place, to which he replied, "Oh, no. You are doing more business than I am in Oxford Street." Consequently the business went on, and she stayed with him longer than the time agreed upon. In answer to the learned Commissioner as to whether the plaintiff's version of the matter was in accordance with the defendant's views, Mr. Mayall said so far as the offer went it was true. She was quite correct in that. She was engaged, he declared, at 10s. a week for a month, but the additional money now sued for was only to be paid on condition that the business "paid." To his regret the business did not pay. Miss Smith desired to add that she was with the defendant for five weeks in all, and he was still carrying on the photographic business which she had started. He had endeavoured to dispose of the business, so it must be worth something, she thought. She was to be paid the additional amount if the business was "successful."—The defendant: No, if it "paid," which it did not.—The plaintiff rejoined that she took £10 15s. in the four weeks, and for a new photographic business she considered it paid.—The learned Commissioner was of opinion that no new business could pay in four weeks, or it would be a very extraordinary concern.—The defendant's daughter testified to the arrangement with the plaintiff being as her father stated.—The learned Commissioner: It is going on now, and is profitable? The defendant said that it was not so. He had offered to dispose of the business to two persons, both of whom had declined it.—The learned Commissioner, in deciding against defendant, remarked that he was disposed to think that the plaintiff's was the more probable story of the two. He should find for her. But if the defendant desired to have the case retried before a jury, he would have an opportunity of doing so. Judgment entered accordingly.

**INFLUENCE OF LIGHT ON THE ELECTRIC DISCHARGE.**—*Engineering* gives the following account of the recent experiments of E. Bichat and A. Righi. A metallic cylinder coated inside and outside with lampblack was electrified negatively and connected with an electrometer. On lighting up the interior of this cylinder there was no perceptible increase in the rate at which the charge was lost, but on allowing a beam of the ultra violet rays to fall on the outside of the cylinder the rate of loss was very considerably augmented. In another set of experiments, M. Bichat illuminated a conductor in the neutral state with ultra violet rays, and under these conditions an electrometer connected with this conductor almost instantly showed the existence of a positive charge, the potential of which, in certain cases, was upwards of seven volts. Even higher potentials were obtained, amounting in one case to twenty volts, when a living plant was substituted for the above-mentioned conductor; but in this case the charge is in general negative. M. Righi's experiments go to show that ordinary coal gas or bisulphide of carbon have not the power of robbing a beam of light of its active rays. The best source of light is, he finds, given by the voltaic arc with zinc rods, whilst ordinary sunlight is ineffective; this he attributes to atmospheric absorption. Both authors refer the phenomena to convection currents set up by the light in the surrounding air.

**NORTH MIDDLESEX PHOTOGRAPHIC CLUB.**—Monday evening last was this Club's lantern night, which was given to an audience of close upon three hundred, in the Iron Room, Stroud Green. The next meeting will be on December 3rd, when John Oakley will give a demonstration on "Enlarging," to which visitors are invited.

**PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.**—Monthly technical meeting, 5A, Pall Mall East, Tuesday, November 27th, at 8 p.m.

**SPIRIT PHOTOGRAPHS.**—One of the most successful forms of deception consists in the exhibition of spirit pictures. When these are not produced by actual substitution, or what is known to the profession as "palming," chemistry lends its useful aid to the perpetration of the fraud. The well-known property of certain colourless salts, to assume colour when saturated with equally colourless solutions of other salts, is often made use of by the spiritualistic fraternity. A picture painted with a solu-

tion of the lead acetate will immediately become black when it is moistened with some fluid containing a sulphite. Silver salts, too, have properties which are exceedingly curious, and a photograph treated by a mercuric solution disappears, to return when moistened with a solution of the iodine of potassium. Perhaps one of the most flimsy impositions is that of spirit photography, two negatives being taken. One of these contains an opaque likeness which, by a very great stretch of imagination upon the part of the credulous individual, may be supposed to resemble the face and figure of some dead friend or relative, and the other is a simple photograph of the sitter. When these two negatives are superimposed and the print is made, it will be found that the result presents the dim outline of a ghostly figure hovering above the living subject. With the proper amount of sleight-of-hand, this trick may be made to deceive persons who possess little or no knowledge of chemistry or photography. —*American Magazine*.

**PHOTOGRAPHIC CLUB.**—The discussion on November 28th will be on "Lantern Matters." This is a lantern night, to which visitors are invited.

## To Correspondents.

\* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

**J. CHESTER JERVIS.**—We thank you for sending the paper containing such interesting particulars, of which—as you will see—we have made use.

**W. BATHE.**—It is a special mixture sold for the purpose, but as far as we know, it does not possess any advantages over similar mixtures of which the formulae have appeared in the NEWS.

**J. R.**—You can remove it by means of a damp warm sponge.

**J. B.**—The proper sensitizing solution is a solution of bichromate of ammonium to which enough alcohol has been added to prevent the solution of albumen film, with which the paper is coated, but not enough to coagulate the film. Only a momentary immersion is usual, after which the paper is hung up to dry, a slip of blotting-paper being placed along the lower edge. We will send you a post card with the exact composition of the solution recommended by Husnik.

**L. L. SAUNDER.**—1. Full directions have appeared in the PHOTOGRAPHIC NEWS, and you will also find working details in the forthcoming YEAR-BOOK. 2. Moderately sized paper is best—paper about as hard as that upon which the PHOTOGRAPHIC NEWS is printed—and there is no advantage in using an expensive paper. You can get a suitable material in rolls from Spaulding and Hodge, of Drury Lane, or Spicer, of Cannon Street. 3. One part of bichromate to ten parts of water; but in warm weather you make the solution rather more dilute.

**H. H. SMITH.**—1. Make a stiffish paste with arrowroot, and apply it evenly to the paper with a soft sponge. Finally, diffuse it by going over the paper systematically with the sponge, first in one direction and then in the other. If the arrowroot paste is lumpy, you must squeeze it through muslin. 2. Grind up permanent-white with the coating mixture, regulating the amount by the degree of opacity required. If you have not a formula of the gelatinous mixture, we will furnish you with one.

## The Photographic News.

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# THE PHOTOGRAPHIC NEWS.

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## HYDROKINONE WITH SODA AND SULPHITE.

CONSIDERING that several years have now elapsed since the addition of hydrokinone to our stock of developing agents, and the comparatively small extent to which it has come into general adoption, it may be supposed by those who have not experimented with this substance that there is some inferiority resulting from its use, to account for such use being so restricted. There may be, however, other reasons sufficient to account for the slowness of its adoption by photographers. The price of the article was, in the first place, high, the action was generally slower than that of pyro, and there is a tendency—not to be overlooked—to be loth to take up with a new method or process when in the constant and regular practice of one that works satisfactorily.

As to the question of cost, there should now not be any objection on that score, as owing to the facts that hydrokinone is cheaper than it was formerly, and that the same solution may be used over and over again with good results, it is doubtful which is actually the least expensive to use, pyro or hydrokinone. Even if the cost of the latter agent were the higher, the difference is not one that would be considered from a scientific point of view; still, it is satisfactory that it need not be considered even from the practical point of view of the photographer who has to make consideration of expense an item of importance.

An indication which points to the possibly more extensive employment of hydrokinone as a developer is the interest which it is exciting abroad. We noticed last week a pamphlet by Balagny, published in Paris, relating solely to the use of hydrokinone as a developer; and in Germany, where the scientific aspects of photography receive so much consideration, a large amount of attention is being devoted to the subject. It may be remembered that in Dr. Vogel's experiments with rapid collodio-bromide described on page 693 of the PHOTOGRAPHIC NEWS, the developer which he gave for use with these extraordinarily sensitive plates was one containing hydrokinone. A recent number of the *Photographische Mittheilungen* contains two articles on this developer. The first is by E. Vogel, junr.; in this he states that although formulæ which had been previously published early in the year, in the same journal, gave excellent results, yet the slowness of their action as compared with that of pyrogallol and alkali, and the cost on account of the large quantity of hydrokinone which they contained, had militated against their general adoption. He further says that with the very slow action of the developer there was, when used on bromide of silver paper, a colouration of the parts unacted upon by light which ought to remain white, and particularly when the exposure had been short.

The formula which E. Vogel now gives is a modification of one previously published by Baltin. The Baltin formula,

he says, works very well and quickly, and on account of the small amount of hydrokinone which it contains, the price is moderate. It has, however, the disadvantage that plates of some makes are—especially in warm weather—liable to frill, on account of the potash contained in it. By substituting soda for the potash of Baltin's formula, E. Vogel finds that this evil is quite got rid of, and that the results are altogether very satisfactory. The development, he adds, proceeds quickly and without frilling or blistering. The developer, moreover, can be used over and over again many times, without discolouring to more than a very pale brown hue. Prints on gelatine bromide paper take a rich black or brownish black tone, and the whites remain perfectly pure.

The formula he gives is as follows:—

Water	...	...	900 c.cm.
Sulphite of soda (not fused)	...	...	40 grammes
Hydrokinone	...	...	5 "
Crystallized carbonate of soda	...	...	75 "

With one single portion of this developer, to which a small quantity of fresh solution was occasionally added, Vogel tells us that he has developed thirty transparencies in succession without much darkening of the solution.

It will be noticed that the proportion of sulphite of soda is large—eight to one. Balagny also uses sulphite in a proportion nearly as large as Vogel, i.e., about seven to one. He attached great importance to the free use of sulphite, which, indeed, he appears to consider the key to a satisfactory use of hydrokinone as a developing agent.

To the testimony of these writers we may add that we have made up a solution to contain about the same proportions of hydrokinone and alkali, though with somewhat less sulphite, and that, with a highly sensitive plate liable to fog on pushing with pyro and ammonia, we obtained a result superior both in intensity and clearness to that which we could produce with the latter agent. The manner of mixing the developer which we made use of was, however, slightly different from that above given, as we prefer having the hydrokinone and soda in separate stock solutions, not only on account of keeping better, but so that more alkali or hydrokinone may be used, as the occasion may suggest. Put into the ordinary English measures the developer consisted of two solutions, such as had been recommended by Vogel when developing collodion plates:—

A.—Hydrokinone	...	...	40 grains
Sulphite of soda	...	...	200 "
Water	...	...	6 ounces
B.—Crystallized carbonate of soda	...	...	1 ounce
Water	...	...	8 ounces

The developer for gelatine plates consists of 6 parts of A to 10 parts of B. Distilled water is not necessary, but it is



desirable for the hydrokinone solution that the oxygen found dissolved in ordinary water should be got rid of, and to avoid a good precipitate in the soda solution, it is as well that the carbonate of lime contained in common water should also be removed. Both these ends are accomplished by boiling the water before it is used. The crystallized soda salts are of course also more readily dissolved in hot than in cold water. The most convenient plan for making up the A solution is to pour the boiling water, or water which has boiled and is still hot, on to the sulphite of soda in a jug, and cover till tepid. A little shaking or stirring whilst hot will have dissolved the sulphite, and when moderately cool it is poured into a bottle containing the hydrokinone. To avoid the danger of breaking a glass measure with hot water, the bottle to contain the mixture may have a mark where the solution (just under  $6\frac{1}{2}$  ounces) will rise to, and something less than this quantity being poured on the sulphite to dissolve it, the solution is poured into the bottle, which is finally filled to the mark with water that has been used to rinse out the jug.

For the soda solution no special directions are necessary. We may add that we have found ordinary washing soda to answer perfectly.

There are some characteristics of the hydrokinone developer referred to in the article by Dr. Bannow, following that of E. Vogel, and in Balagny's work, which will be dealt with when we return to the subject.

#### EXPERIMENTS ON GLASS IN POLARISED LIGHT.

At a meeting of the Physical Society, held on the 10th instant, Prof. S. P. Thomson read an interesting paper on the behaviour of glass in polarised light, and the *Chemical News* gives the following report of the paper and the discussion.

Irregular pieces of glass can be tested for internal strain by immersing them in a liquid of equal refractive power. Various specimens of tubing, rod, and thermometer tubes were examined in this way, all of which showed defective annealing. One piece of ordinary rod bent zigzag produced remarkable effects when rotated in the liquid. Prince Rupert's drops, a glass wedge, and a model of the "Regency Diamond" showed vivid colours, and the stems of broken incandescent lamps exhibited various degrees of annealing.

Mr. HILGER wished to know whether paralleled plates had been tested, and with what result; for he had always found pieces of shapes approaching to roundness to show greater defects than parallel plates. For this reason he always cut his prisms and lenses from rectangular blocks.

Mr. BLAKESLEY said that no perfectly annealed thermometer had been shown, and he was anxious to know whether any existed.

Mr. WILSON expressed a doubt as to whether it was possible to anneal anything so as to be perfectly free from internal strain, and thought the act of breaking rods and tubes necessarily introduces strains.

Prof. RUCKER asked whether the usual method of detaching a mercury column for calibrating thermometers produced any injurious effect, but the author was unable to speak decisively on the subject.

In answer to the President, Dr. THOMPSON said the liquid used was a mixture of carbon bisulphite and alcohol. His experience with parallel plates coincided with that of Mr. Hilger. As an example of the remarkable effects which could be produced on glass by various methods of cooling, he directed attention to the fact that Prof. Exner, of Vienna, had produced lenses having plane faces.

#### A RUSSIAN PHOTOGRAPHIC PAPER UPON THE MEDAL QUESTION.

A RUSSIAN photographic paper, edited by Dr. Paul Alchin, refers to the programme of the Moscow Photographic Exhibition, and makes the following remarks:—

Awards at Photographic Exhibitions.—The programme at the photographic exhibition to be held this winter in Moscow, announces an enormous number (165) of various prizes, a thing very much to be deplored, because it is expected that it will result in entirely destroying the real value of medals and other awards. Indeed, some are sarcastically remarking that exhibitors have changed into shops for the distribution of medals. Those whose chief aim is to obtain a prize, undoubtedly, only constitute a very small percentage of the works ordinarily sent for exhibition. A proof of this was given at the exhibition in St. Petersburg this spring. It was opened on the 2nd of February, and only on the 5th did the council of the Imperial Technical Society announce their intention of awarding medals to the best exhibitors; therefore, no awards were contemplated when the exhibition was organized. Nevertheless, a large number of photographers, out of interest in their art, and respect to the public who visited the exhibition, contributed their works with the utmost readiness.

If an exhibition distinction is not to be regarded as a mere compliment, but as a serious acknowledgment that the merits of a production stand prominently above the line of ordinary work, and fulfils all the requirements of a science in accordance with the means at present at command, then there will only be a few awards to make, because it is hardly likely that anywhere are to be found more possessing extraordinary talent than could be counted on one's fingers. Besides this, we consider that judges should not be obliged to award all the prizes at their command. In making selections for the highest prizes there ought to be an incontrovertible standard, and not merely a comparison of the exhibits among themselves. Certainly it might happen that a great number of praiseworthy productions had been forwarded, but none of them, in the strict sense of the word, could be taken as a trial masterpiece. Then it would be consistent to acknowledge that such a *chef d'œuvre* had not been exhibited, and there had been no one to merit the award.

Niggardliness in awarding prizes to exhibits would serve to remove a great deal of enmity and dissatisfaction, which is often the case where there is an abundance of awards. In fact, if at an exhibition in which several hundreds—not tens—of exhibitors took part, only a few prizes were adjudicated, then they would be acknowledged as meritorious distinctions, the acquirement of which would be something to be proud of. Such a discrimination would stimulate every participator to regard the production of his work with greater zeal and attention; which, of course, in its turn, would assist in the improvement and attainment of perfection in photography. At the same time, the small number of awards would possibly alleviate the difficulties of the judges, because it is much easier to settle which production is most prominent among superior work, than to define how much one good work was better than another. Perhaps it would be desirable, where the number of awards was very small, to empower the judges to award honorable mention for the working out of any new special process, or adaptation of photography representing advance in the art, not giving it the character of a distinction of merit, but merely as an encouraging acknowledgment of industriousness.

It appears to us that too many awards were made at the first photographic exhibition (in St. Petersburg). Now, the Moscow organizers are determined to outdo it in that respect, which will hardly benefit our aim, but will surely prepare the way for under-estimating the value of awards for photographic productions. We, however, do not wish that our meaning should be misconstrued; we perfectly agree that the awards made to photographs exhibited in the spring were for very creditable work. At the same time we take the liberty of expressing an opinion that it should be obligatory for everything exhibited to be creditable, and only those be "medalled" which really rise much above the average.



We should much like to see the time when the award of a medal photography would be regarded as an event worthy to be announced to the newspapers by telegraph, and when a medal would be an incontestable witness that the recipient, had out-distanced his rivals in the art.

## HOW I OBTAIN CLOUDS AND DISTANCES IN MY LANDSCAPES, OR THE PERFECT AUTOMATIC SKYSHADE.

BY E. V. BOISSONNAS (GENEVA.)

EVERYONE knows what a charm is added to a landscape if, at the same time that the foliage is well delineated, we can have a sky with clouds; if, in addition to that, we obtain the distance—snowy summits, for instance—the picture becomes still more perfect. Now, this is precisely one of the greatest difficulties of landscape photography. It almost always happens that if the plate has received sufficient exposure for the foreground planes to come out properly, the distance is lost, blended into the sky. If, on the other hand, the plate is exposed for a very short time to preserve the clouds or the distance, the foliage invariably comes black, more resembling silhouettes of cut-out card than trees. What is required is a means of exposing the foreground planes longer than distant ones, unless, indeed, clouds are introduced into the sky when printing. In order to make use of the first named means, “skyshades” have been proposed. We find two patterns of such in the “British Journal of Photography Almanac” for 1885, pp. 121 and 215. The one proposed by Walter B. Woodbury consists of a simple piece of black card cut into notches. The card masks from the lens the rays proceeding from the sky or from the distance. After an exposure sufficient for the foreground planes, the card is removed, and a short exposure is given to permit of the distant planes impressing themselves. This method may succeed in certain cases, when the horizon line is not too irregular, but for the most part it would be difficult or impossible to make use of it. One is then compelled to retouch on the negative the snowy summits of the distance, and to introduce clouds when printing on the paper. This operation is very delicate, and very difficult, not only on account of difficulty of execution, but particularly on account of the choice of the cloud negatives. Mr. Gale has developed this subject with great ability, but his letter itself, by pointing out the delicacy of choice to be made amongst cloud negatives, is enough to make many persons recoil from attempting the operation.

For some years past I have worked a good deal in the preparation and use of “orthochromatic” plates, and the experiments that I have been obliged to make in all the parts of the process, in order to assure myself of the good quality of the plates for various uses (landscapes reproductions of coloured objects, pictures, stained glass, &c.), have led to my finding the automatic skyshade *par excellence*. It consists in the use of orthochromatic plates, and of a yellow medium interposed in the path of the luminous rays forming the image of the camera.

The use of a glass coloured green in conjunction with ordinary plates has already been proposed in order to arrive at this end, but I do not think that much is gained by this means (all my experiments have proved to me that there is no advantage) in a green-coloured glass of ordinary gelatine plates are used).

In fact, let us suppose that we have to photograph a landscape containing foliage in the foreground, a vaporous bluish distance, snowy mountains in the background, and white clouds in a blue sky. Let us consider what takes place if we put a yellow medium in the path of the luminous rays forming the photographic image. Looking on the ground glass we notice that the foliage of the foreground is in no way darkened by this yellow medium; on the contrary, it seems that its tint has become lighter. The bluish tint of the atmosphere separating the vapoury

distance from the lens become changed to a greenish colour, and from this fact, the distance, compared with the foliage of the foreground, appears darker than it was before the interposition of the yellow medium. The tint of the snowy mountains and of the white clouds becomes pale yellow, the blue sky becomes green.

In these conditions let us expose an ordinary plate. Although the yellow colour of the snowy mountains and of the clouds is infinitely lighter than the green tint of the sky, the ordinary plate being less sensitive to yellow than to green, these two shades are reproduced in a uniform manner on the negative. At the same time we have obtained no advantage in the exposure of the foliage of the foreground.

We obtain then a result as bad as if we expose the ordinary plate without the interposition of the yellow glass.

If we expose an orthochromatic plate under the same conditions the result is quite different. This plate (if properly prepared) reproduces all the colours with the relative value appropriate to each, the pale yellow colour of the snowy mountains and of the clouds will be reproduced lighter than the green tint of the sky. The greenish tint of the vapoury distance will permit a sufficiently long exposure to be given for bringing out the foreground planes, without causing the distant planes to disappear from the negative. Result: The foreground planes will be sufficiently exposed, the more distant ones will not be too much so, they will therefore be distinct; the snowy mountains and the clouds will be visible in the sky. Thus, by the employment of a yellow medium and an orthochromatic plate, we possess an automatic sky-shade *par excellence*.

By this method I have been able to photograph Mont Blanc from Geneva, the distance being about 80 kilometers. Never before, to this day, has anyone succeeded in obtaining this result. In the same way, from the summit of Mount Rose, I have been able to photograph Mount Viso, distant about 200 kilometers. I think, then, that this mode of proceeding will be applicable, with success, to photography at a great distance.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

REDUCTION OF SILVER RESIDUES—PYRO DEVELOPMENT WITH POTASSIUM META-BISULPHITE—PRESERVING GELATINO-CHLORIDE PRINTS—THE PHOTOGRAPHIC ROCKET—TRANSPARENCIES BY GELATINO-CHLORIDE WITH DEVELOPMENT.

*Reduction of Silver Residues.*—Mr. A. Lainer has presented to the Imperial Academy of Sciences of Vienna a paper on the Use of Hydrochloride of Hydroxylamine in the Quantitative Analysis, which contains very useful hints about the recovering of the metallic silver from photographic residues. Hydroxylamine hydrochloride, in combination with caustic potash, reduces the silver out of silver nitrate, silver bromide, and silver iodide in a short time perfectly. Instead of the pure hydroxylamine hydrochloride, Mr. Lainer recommends the use of the reducing salt which is placed on the market by the Badische Anilin und Sodafabrik, of Karlsruhe, and the kilogramme of which only costs 2 marks. If this reducing salt is mixed with silver nitrate solution, a whitish precipitate is formed. Addition of caustic potash solution causes effervescence, and at the same time precipitates the metallic silver, which forms itself into balls if the mixture is warmed. By decantation and washing with hot water it is freed from the adhering caustic potash, potassium chloride, &c.; then it is dried and placed in a covered crucible on a coke fire, and gradually heated. In the same manner are treated silver bromide and silver iodide; also solutions of chloride, bromide, and iodide of silver in hyposulphite of soda solution. The precipitated and molten silver may at once be worked off silver nitrate.



**Pyro Development with Potassium-Meta-Bisulphite.**—In the *Correspondenz* Dr. Eder communicates his experiences with meta-bisulphite as an addition to the pyrogallic acid solution for development. The meta-bisulphite is a whitish crystal powder which, in the solid state, as well as in the form of an aqueous solution, smells decidedly of sulphurous acid. An aqueous 2 per cent. solution of this salt dissolves pyrogallic acid with a slightly yellowish colour. The solution, preserved in half-filled bottles, has kept very well for four weeks, and was then better conserved than the usual solution of pyrogallic acid and sulphite of soda. This solution, mixed with soda, quickly develops a picture which, however, is decidedly yellow-coloured in the gelatine film. To obtain an agreeable brownish or blackish colour of the negatives, more sulphite of soda must be added to the soda solution. If the proportion of the meta-bisulphite in the pyro-soda developer is increased, the latter acts very slowly; larger quantities of potassium meta-bisulphite act therefore like a powerful restrainer. If only small quantities are added no injurious restraining action shows itself, but the plates then acquire in this developer very clear shadows, and the image appears more slowly and increases more slowly in vigour. Dr. Eder obtained good results with the following solutions:—

A.—Pyrogallic acid	...	...	4 grammes
Potassium meta-bisulphite	...	...	1½ "
Water	...	...	100 c.c.

The solution keeps for weeks in well-stoppered red bottles.

B.—Crystallized soda	...	...	10 grammes
Sodium sulphite (neutral)	...	...	15 "
Water	...	...	100 c.c.

Before use are mixed—

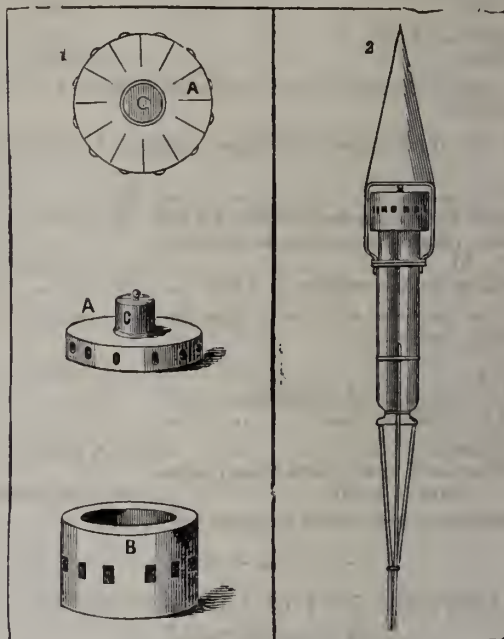
Pyro solution A	...	...	20 c.c.
Soda solution B	...	...	20 "
Water	...	...	20 "

The developer acts about one and a-half times more slowly than the ordinary pyro-soda developer, to which it in general comes very near, and imparts to the negatives an agreeable colour and a pretty tenderness with clear shadows. If it is intended to make the negatives thinner, more water must be taken, 30 to 40 c.c., for instance; if, however, the negatives are to be made more vigorous, the proportion of the soda is increased and the proportion of the water diminished in the developer. It is recommended to place the negatives in an alum bath before fixing. An advantage of this developer is the great keeping quality of the pyro meta-sulphite solution. The price is about the same as of the usual pyro developer. At all events, the potassium-meta-bisulphite deserves to be tried further, as it also preserves well hydroquinone solutions.

**Preserving Gelatino-Chloride Paper.**—Recently it has been recommended by some operators, in order to prevent the prints on gelatino-chloride (or aristotype) paper from turning yellow, to add a little nitrate of lead to the combined toning and fixing bath. About 5 grammes of the salt are added to 1,000 c.c. of the bath. If half a grain of nitrate of lead is added to the hypo bath, it will bring up an undertoned silver print.

**The Photographic Rocket.**—An interesting photo-pyro-technical apparatus, invented by Amedée Denisse, is described in the *Archiv*. It is a photographic parachute arrangement, consisting of a small cylindrical camera, round the circumference of which twelve small lenses are placed at regular intervals. Inside the camera, between the lenses, are partitions, which prevent the rays entering the various lenses from crossing and interfering with each other. The dark slide, which has also a cylindrical form, and which contains the sensitive film, C (fig. 1), is inserted in the centre of the camera. A circular shutter, B, in which twelve apertures, corresponding to the twelve lenses,

are pierced, works by its own weight. It is fixed to a quick-match, which is set on fire by the rocket at the end of its flight. As soon as the quick-match has burnt through, the shutter falls down, and thereby quickly opens and closes the lenses. At the same time the end of the same quick-



match operates upon the locking-spring of the parachute, and puts it up. The rocket is held captive by a long string, by which it is then drawn down again by the operator. In fig. 2 the photographic rocket arrangement is shown ready for use. It is said that the resulting small negatives are sharp and clear enough to make enlargements from them.

**Transparencies by Gelatino-Chloride with Development.**—In Dr. Eder's excellent Year-Book for 1889, the first part of which has just been published, is described a process for making gelatino-chloride for transparencies with development, as it is practically worked at the Imperial Teaching Establishment of Vienna. According to this formula the emulsion is prepared in the following manner:

A.—Silver nitrate	...	...	30 grammes
Water	...	...	50 c.c.
B.—Gelatine	...	...	25 grammes
Chloride of sodium	...	...	14 "
Water	...	...	200 c.c.
C.—Winterthur gelatine	...	...	25 grammes
Water	...	...	250 c.c.

are dissolved by heat. In the dark room B is mixed with C, and then A gradually added to it, well stirring all the time. When cooled, the emulsion is washed in the usual manner. The above quantities will give about two litres of emulsion. The transparency plate, coated with this emulsion, is exposed in daylight under the negative in the copying frame for one-half to two minutes. The plates are developed with a weak solution of ferrous oxalate, or ferrous citrate, or hydroquinone.

I. **The Ferrous Oxalate Developer** is prepared by mixing equal parts of the following solutions:—

A.—Neutral potassium oxalate	...	...	25 parts
Bromide of ammonium	...	...	1 part
Water	...	...	100 parts
B.—Ferrous sulphate	...	...	10 parts
Water	...	...	150 "

Citric acid, a small portion.



II. *The Ferrous Citrate Developer* :—

A.—Citric acid	...	...	...	25 grammes
Water	...	...	...	700 c.c.
Ammonia (0.91 sp. w.)	...	...	...	16 "
B.—Ferrous sulphate	...	...	...	1 part
Water	...	...	...	3 parts
C.—Chloride of sodium	...	...	...	1 part
Water	...	...	...	30 parts

Before use, 15 parts of A are mixed with 5 parts of B and 1 part of C.

III. *The Hydroquinone Developer* is prepared by mixing of—

Water	...	...	...	30 c.c.
Alcoholic hydroquinone solution (1 : 20)	...	...	...	10 drops
Aqueous potassium carbonate solution (1 : 5)	...	...	...	5 to 10 drops
Chloride of sodium solution (1 : 20)	...	...	...	1 to 3 "

The plates are fixed with hypo, then they are toned in the following bath :—

A.—Water	...	...	...	1,000 parts
Sulphocyanide of ammonia	...	...	...	40 "
Hyposulphite of soda	...	...	...	30 "
B.—Water	...	...	...	1,000 parts
Solution of gold chloride and potassium (1 : 50)	...	...	...	60 to 80 parts

Both solutions are poured together before use.

## PICTURES BY THE ACTION OF COLD.

BY D. WINSTANLEY.\*

## ARTICLE III.

I AM almost ashamed to admit that I am surprised by the results of my own experiments, for such surprise is an evidence that my theorising has been either insufficiently or defectively performed. The fact, however, is that on the morning of October 5th I was again and agreeably surprised in the matter of my pictures by the action of cold.

On raising the screen of paper bearing the cross in black, about two-and-a-half hours after sunrise, when possibly the air without was warmer than the air within (though the sun did not shine upon the window), when, at any rate, evaporation of the dew deposit had set in, I found the picture in moisture had assumed another form, and consisted now of a clear glass cross upon a ground of spangling stars. The feeble moisture which the night before had formed the seeming ground glass figure of the cross had disappeared, and the spangling drops alone remained, doubtless diminished in their size, but not visibly altered from what they were the night before. The reason of this is obvious. There was less moisture in the figure of the cross than in its background, and so in any case, when evaporation had set in, it would exhale the first, and, further, the black cross would absorb heat and become warmed sooner than the paper on which it was depicted, and give a greater amount of heat to the moisture near it than the unpainted paper gave to the ground near it. I should, accordingly, expect that pictures by exhalation would be producible by the use of screens such as I have described, even when the quantity of moisture in the shape of dew was substantially evenly disposed at the commencement of the experiment. This is, however, a matter for future observation.

Another form of experiment was next tried. A stencil representing leaves was cut in a sheet of tin, and the metal was silvered by rubbing with a little mercury. This stencil was fixed within about a quarter of an inch of one of the window panes, the idea being that in the cold of night the radiant energy of the room would strike upon

the glass through the openings in the stencil, and so retard its cooling; whilst behind the tin itself the deposition of the dew would go on with some amount of energy, and produce a moisture picture, with the pattern in pure glass upon a diffusive ground.

The experiment proved this view to be correct, and a picture of the kind was so obtained. Later in the night it was succeeded by the second kind of picture—a misty representation of the stencil lines upon a spangled ground, and in the morning this was followed by one having a similar ground with a clear glass picture on it. My experiments of this kind are now becoming numerous, as I continue their repetition daily with several screens varied as experience or curiosity may suggest. Sometimes days pass by without the production of any pictures whatsoever, as, for instance, when the temperature does not fall sufficiently low, or when the moisture in the air is not present in sufficient quantity. My best results have been obtained when a thermometer in the room has sunk to 40° on Fahrenheit's scale, and when wet and dry bulbs have shown readings which were similar, indicating comparative saturation of the air.

I now pass on to other considerations in connection with this matter, and to experiments of another kind. The Chinese tradition Mr. Harrison alluded to in his history of photography "credits the sun with sometimes producing pictures of the neighbouring objects on the ice-covered surfaces of lakes and rivers." Of course, the pictures which the sun produces are not frigerograms at all, but thermograms, notwithstanding that they are produced upon an icy surface, and so are the exhalation pictures which have been described.

Near to where I live there is a church, "surmounted" by a dome-capped tower, which, when the sun is shining during certain portions of the day, throws its shadow on the roof below. Last winter I observed this shadow projected on the roof when the latter was covered with hoar frost. The sun shone brilliantly for some fifteen minutes, and was then obscured by clouds. The result was a thermogram of the tower, a "fuzzy" picture in hoar frost, on the dark damp background of the slates. It was an instance of the sun producing a picture of a neighbouring object on a surface covered with ice. Such pictures, far from being rare, must in fact be common. A range of mountains, a clump of trees, a house, a haystack, a cart, a heap of stones—anything, in fact, which casts a shadow—will suffice for the production of its picture in hoar frost when the sun has power enough to melt that "frost" and reveal a comparatively darkened ground. The sharpness of the picture, and the time of its duration, will depend amongst other things on the rapidity with which it is produced, and on the obscuration of the solar rays after its production. The "texture" of ice itself I have observed (in circumstances yet to be described) to be altered by the passage of the sunshine, and I have no doubt, when carefully looked for, pictures of neighbouring objects will frequently be found depicted on surfaces of pure ice.

In the *Scientific American*, several years ago, I remember there was an engraving from a photograph of a block of ice cut from the East River at New York. In this block there was an excellent picture of a table, an umbrella, and a chair, though how in the world they got there I can neither gather nor surmise.

Seeing that thermograms and frigerograms can be easily produced in moisture, and probably in ice, one is naturally led to the enquiry, "Can they not be produced in something else?" From a theoretical point of view the thing seems easy, as the physical properties of chemical bodies vary very considerably indeed. We have substances which melt, vapourise, sublime, or condense at almost every natural temperature of the air, and it seems probable that amongst them substances may be found which will give us pictures of neighbouring objects by the operation of either heat or cold. We have chemicals which appear of one colour when anhydrous, and



of another when hydrated. The nitrate and the chloride of cobalt are conspicuous instances of the kind. Both these salts in their "natural" and hydrated state are pink, and when they are anhydrous they are blue. The pink is faint and pale; the blue is full and dark. These are the materials used in the formation of some of the so-called "sympathetic inks." When a weak solution of either of them is written with, the writing produced is almost if not altogether indistinguishable when "dry," but appears of a full blue colour when the paper on which it has been inscribed is warmed, and this blue colour fades away as the paper cools, and the cobalt salt upon it becomes impregnated by its deliquescence with moisture from the air.

I have accordingly tried one of the salts of cobalt for the production of pictures by both heat and cold, and I have been encouraged in these experiments by success. The chloride was the salt I used, and the strength of the solution was one in tens by weight, water being the solvent of the salt. Sheets of common writing paper were brushed over with the preparation and spontaneously allowed to "dry," when their colour was pale pink. Exposed behind a stencil for a moment to the radiance of a fire, a vigorous blue picture shot into existence in two or three seconds' time, and faded when allowed to cool. Such a result was of course inevitable, and followed as the night the day on the action of the salt.

Far more interesting, however, from a philosophical point of view, were the following experiments, though the results were much less bright:—

Experiment No. 1. A sheet of cobalt paper, brushed with the solution on both sides, was warmed before the fire until it had assumed a dark blue tint. It was then placed in contact with a sheet of uncoloured paper, marked coincidentally on both sides in Indian ink with the figure of a cross, and also warmed. The two were stretched between a pair of cardboard frames held together by letter-clips at their sides, and the combination was exposed on a warmed board with the cobalt paper to the evening sky. The result was a cross in blue upon a ground of pink, not brilliant, but perfectly distinct. The ground had cooled the soonest and had faded first. Of course the whole picture presently disappeared.

Experiment 2. This same combination, the cobalt side then pink, was placed the following morning in a window with the cross side to the rising sun. Result:—The picture of the cross came up in blue.

(To be continued.)

## RECENT ASTRONOMICAL WORK AT THE LICK OBSERVATORY.

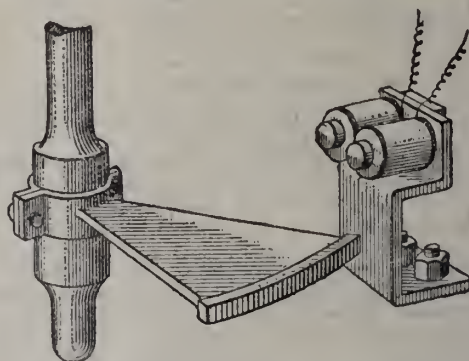
BY JAMES E. KEELER.

THE Lick Observatory was transferred to the Regents of the University of California on June 1st, 1883, and has, therefore, been in active operation as a State institution for about four months. Much of this time has been devoted by the astronomers to studying the instruments under their charge and determining the constants necessary for future work, the great telescope naturally claiming the largest share of attention; but many observations of important phenomena have been made, and the objects of greatest interest in the sky have been carefully examined with a view to the discovery of new features, as well as for the purpose of testing the performance of lens.

The sun has not yet been observed with the great telescope, but it is doubtful whether any advantage can be gained here in the study of his surface by the use of a large instrument. The seeing on Mt. Hamilton is usually poor in the daytime, owing probably to the heated air of the surrounding valleys, which is rapidly cooled at night by radiation, or shut in by the fogs which then pour in from the ocean. Mercury and Venus have been seen in the daytime only, and, therefore, under the same disadvantageous circumstances. There are, however, days of good seeing, when the features of these planets can be profitably studied.

The moon is a most beautiful and interesting object with the great telescope. It was photographed throughout an entire lunation in August, and the pictures then obtained are a distinct advance on all previous work in this direction. The diameter of the lunar image on the negatives is five-and-a-quarter inches, and with the plates used the exposure required was a little less than half a second. Observations were made with the various instruments during the total lunar eclipse of July 22nd, and will be published in the memoirs of the National Academy of Sciences.

Mars had become too low in the west after the transfer of the observatory to be well seen. Numerous drawings were, nevertheless, made by Prof. Holden, Mr. Schaeberle, and myself, and published in the *Astronomical Journal*. The principal canals of Schiaparelli were seen, not as double, but as single, ill-defined lines; and the continent of Libya, which, according to M. Perrotin, had been submerged or did not exist during April and May, appears on the drawings in its usual shape and position. The micrometer observations of the satellites made by myself when the planet was in opposition have been published in the *Astronomical Journal*. The satellites, which appear to have been seen with great difficulty elsewhere, were bright and easy objects with the 36-inch equatorial—a fact which affords gratifying testimony as to the superiority of the instrument and the excellence of the atmospheric conditions. Phobos was seen on July 18th, when its brightness was only 0.22 of that at mean opposition, and one-eighth of that at the time of discovery by Prof. Hall. From the ease with which this satellite was seen in close proximity to the planet, it seems to me probable that we can observe eclipses during favourable oppositions, and determine the mean motions of the satellites with greater accuracy than is obtainable by micrometer observations.



ELECTRIC CONTROL OF THE GREAT TELESCOPE.

Jupiter was frequently examined on fine nights in June and July. His surface showed a wealth of delicate detail which would have required a much longer time to record satisfactorily than it was possible to give. A number of observations were made of curious appearances presented by the shadows of satellites in transit. The satellites themselves appear as large and well defined discs.

Saturn has not been observed since the telescope was first mounted in January. It was then a splendid object, all the wonderful details of the system shining with a brilliancy and distinctness probably never before equalled. The outlines of the rings were sharp and clear, and a fine dark line was seen close to the outer edge of the outer ring, with a dark shading extending inward toward the great black division. The gauze ring was very conspicuous.

Neptune has been observed by Prof. Holden and Mr. Schaeberle, and (with its satellite) has been photographed several times.

Many double stars have been discovered and measured by Mr. Burnham with the 36-inch and 12-inch equatorials. Perhaps the most interesting of this class of objects discovered with the aid of the large telescope is the star  $\rho^6$  (Gamma)  $\gamma$  Cassiopeæ, which is found to have a minute companion distant 2.2", in position angle 256°. It has been frequently observed lately with the 12-inch equatorial. Difficult stars previously known have also been measured by Mr. Burnham.

The planetary nebule have been studied by Prof. Holden and Mr. Schaeberle, who have observed in several of these objects



curious helical forms, which do not appear in earlier drawings with smaller instruments.

The ring nebula in Lyra is a wonderful object in the great telescope. The central star discovered by Von Hahn is very conspicuous, and four other stars of exceeding minuteness appear within the limits of the inner ellipse, while a star almost as bright as the one in the centre is seen exactly at the preceding extremity of the major axis of the ring. Many other small stars not so critically situated, and therefore less interesting, are seen in proximity to the nebula. These minute stars are beyond the range of all but the most powerful telescopes, although it may be noted that there is a class of observers with very small telescopes prepared to immediately "verify" all discoveries made by powerful instruments, even when, as has sometimes been the case, the supposed discoveries are afterwards found to be purely fictitious. There is no way of disproving that a difficult object can be seen by such an observer with an apparently inadequate instrument, or of showing that excess of zeal is made to take the place of sufficient optical power. Mere size, it is true, unaccompanied by other qualities, counts for but little, and the greater part of astronomical work has been done by skilled observers with instruments of moderate dimensions. To many persons the cost and difficulty of construction of great telescopes seems out of proportion to the optical advantage gained, but the same thing is seen in other departments of astronomy, as well as outside of the science. A sextant, with which the places of the stars can be determined to within a fraction of a minute of arc, costs less than a hundred dollars, while thousands must be expended if fractions of seconds are to be taken into account, the error of position in either case being beyond detection with the unassisted eye.

The 12-inch telescope has been used by Mr. Barnard for the observation of comets and nebulae. It has been found by him to be capable of giving photographic images of exquisite sharpness, and in this capacity forms an important addition to the outfit of the observatory. Twenty-five new nebulae have been discovered by Mr. Barnard with this telescope, and a comet (comet *c* 1888) was discovered by the same observer with the 4-inch comet-seeker on September 2nd. It is probable that the 12-inch telescope will be fitted with a new driving clock, in order to better fit it for photographic work.

No change has been made in the dome and hydraulic elevating floor of the large telescope. The convenience and, indeed, necessity of the elevating floor is every day more apparent. The rapid motion of the eye end of the telescope (a foot in eight minutes for an equatorial star) would alone make the use of an observing ladder proportioned to the size of the instrument extremely troublesome. The pier, when finally placed exactly in position, will probably be filled with brick and sand.

The driving clock of the large telescope was provided by the makers with an electric control, for keeping its rate in exact coincidence with that of a standard astronomical clock. The vertical shaft of the governor rotates in one second, and has near the bottom a small projecting pin. A stud on the end of the armature lever of an electro-magnet is struck by the pin as the governor shaft rotates when a current is passing through the magnet; but when the current is broken once a second by a standard clock, the stud is withdrawn at the proper instant to allow the pin to pass. There is also an ingenious and beautifully constructed attachment for breaking the circuit in case the standard clock should, either by accident or design, omit one or more seconds in a minute. The driving clock is adjusted to run a little fast, and is continually checked by the control, the governor being allowed to rotate by turning in a friction collar. It was found, however, that the impact of the pin on the governor shaft against the stud of the armature caused a shock which was transmitted to the telescope, and produced a disturbance of the image fatal to photographic work. The control was therefore removed, and another, which I devised for the purpose of giving a perfectly smooth motion, was substituted for it. The new control answers its purpose so well, and is of such extreme simplicity, that I shall give a description of it here, as it can be applied to any clockwork having a shaft which rotates in an integral part of a second.

A soft iron sector subtending an angle of  $36^\circ$ , and having a radius of 6 inches, is clamped to the vertical axis of the governor, and rotates in a horizontal plane. The sector passes very close to the poles of an electro-magnet (part of the old control) which is mounted on a slightly elastic standard of steel. At every second a strong current is sent through the coils of this magnet by means of a standard clock, the circuit being closed, as in the

case of the old control, by the relay points of the chronograph attached to the driving clock. The driving clock is set so as to run a little too fast, and when the governor is started the sector gradually gains upon the click of the chronograph until it reaches the magnet of the control, when the friction produced by the attraction of the latter prevents any further acceleration, and the governor will rotate in exactly one second by the standard clock as long as the control is in operation.

The elasticity of the support on which the electro-magnet is mounted plays an important part in the proper working of the control. When the sector passes at the exact instant of the passage of the current, the magnet springs in toward the sector and comes into actual contact with it, very greatly increasing the friction, while the passage of the sector at any other instant meets with no resistance, the magnet being slightly withdrawn by its support.

The current used with the control is obtained from the battery of twenty gravity cells, employed during the daytime in transmitting time signals to San Jose. As the signals are not sent at night, the battery is then connected with the control by turning a switch. With this control no shock is communicated to the telescope, and the image of a star is steady.

Since, however, changes of refraction and slight irregularities in the clockwork produce small displacements of the image in a telescope, it has always been necessary in photographing with long exposures to keep the telescope pointed by hand, correcting any displacement which may occur by the slow motions of the instrument. It was found impracticable to move the immense mass of the Lick telescope with the quickness and delicacy required in this operation, and after various experiments Mr. Schaeberle suggested that the photographic plate should be mounted upon double slides, one moving in right ascension and the other in declination, and should be kept upon a star by means of a diagonal microscope attached to the plate. A rough experimental model was constructed on this plan by the observatory machinist, and performed so satisfactorily that a plate-holder of more accurate workmanship will be made on the same principle.

The public receptions on Saturday evenings interfere greatly with these experiments, as all apparatus must then be removed to fit the telescope for visual observation. Probably few visitors are aware of the hindrance to astronomical work caused by their entertainment, although, as a duty to the public, the sacrifice is always cheerfully made. Many fine nights are to be expected during the months of October and November, but after that fog and rain will almost put an end to observation until the succeeding spring.—*Scientific American*.

## INDIAN PHOTO. NOTES.

BY J. L. DOBIE.

1. *Plates*.—Most plates will do in India, excepting when and where the climate is hot and damp; then some plates frill hopelessly, as it is difficult to keep the water cool, unless one has ice, while other plates behave well as regards frilling. Chrome alum in the emulsion does a great deal to prevent frilling. The Americans, probably on account of their climate, seem to have paid more attention to the manufacture of tropical plates than the English, who, though the British Empire embraces every climate on the face of the earth, will not look beyond the narrow limits of their own island. Mr. W. K. Burton, who has lately become a professor in Japan, has been experimenting on the addition of chrome alum to bromide gelatine emulsion to prevent frilling, and with satisfactory results. But we have it, on the authority of Mr. E. Stebbing, of the Photographic Society of France, that Mr. Mennons has found that not only old plates, but new ones can be developed in hot solutions, if the plates are previously soaked for a few minutes in a 5 per cent. solution of alum. Possibly, after soaking in the alum solution, it is necessary to use a hot solution, in order to overcome the retardation of development caused by the alum. At any rate, Mr. Mennons is stated to have used his developer hot. (*British Journal of Photography*, August 10, 1888.)

2. *Films and Negative Papers*.—The Vergara Film (Froedman's patent) is as near glass as it can be, and its application in Vergara's dark slides is quick and simple. It is slow, as slow as "ordinary" as compared with "rapid" plates, and it is liable to stain unless quickly developed; therefore it is advisable to over-expose. The transparent substratum, on which the sensitive emulsion is laid, stains during development; and, once stained, it is



difficult, if not impossible, to clear it. Mr. E. Stebbing, aforementioned, has produced a film which seems to be identical with Vergara's. The experience of one of our honorary secretaries with Eastman's stripping films in India has not encouraged me to try them. But I have used Eastman's negative paper, and have produced good pictures with it, most of them instantaneous ones of trains in motion. It is said that the only difference between them, oiled and unoled, is in the time they take to print. But I have found that the unoled show the grain of the paper; whereas the oiled do not. And this is supported by a statement in the *British Journal of Photography* to the effect that Talbot-type prints do not show grain because the paper negatives were waxed. Paper negatives are prone to suffer from Indian damp, and Vergara's film is more liable than plates are to suffer from it.

3. *Printing*.—In this we have large choice of methods. Printing on albumenised or plain salted paper, even when the paper is bought ready-sensitised, requires as much judgment, and takes as much time and trouble, as the slowest of the printing by development processes. And, though some ready-sensitised albumen papers are trustworthy, there is an idea abroad that many are not; that some are sensitised in too weak silver baths, and that the preservative—such as citric acid—used with some, interferes with the toning; in fact, to remedy this latter defect, it is recommended to neutralise the acidity before toning, by the use of an alkaline solution. The changes which take place in albumen and salted paper prints during washing, toning, and fixing, are so great that the judgment required in printing and toning by this process is equal to that required in exposing and developing bromide papers. Alpha paper is slow to print and slow to develop as compared with bromide papers; it also requires toning, as a rule; and it often changes a good deal in toning and fixing. But, when well understood, it gives admirable prints of different tones, as desired—and its delicacy of detail is excellent. Eastman's bromide paper is quick to print and quick to develop; it requires no toning, and fixing does not alter the colour of the developed print. I have used it largely, but have failed to get with it the delicate detail given by Alpha. Judging by the picture of "The Thistle" (*British Journal of Photography Almanac*, 1888), Morgan and Kidd's paper seems very good. Carbon printing has the disadvantage that, in India, one must sensitise the tissue oneself; and this disqualification applies to the old Platinotype processes, whether by hot or cold development. With the exception of the printing-out process for albumenised or salted paper, all the above have been printing processes by development; but now we have Captain Pizzighelli's new printing-out platinotype process, in which the printing can be watched, and in which fixing is done by a solution of hydrochloric acid. Paper (ready-sensitised) for this process can be obtained of C. A. Rudowsky, 3, Guildhall Chambers, Basinghall Street, E.C. It is called "Pizzighelli Platina direct printing paper." The Platinotype Company supplies the paper, and chemicals for preparing it. Printing by daylight and washing in hydrochloric acid solution are the only operations required. To make a good print, by any process, a good negative is essential. Thin negatives, especially those which are thin from over-exposure, may be improved by intensification, which is well described in the *British Journal of Photography* of August 10 and 17. In bad cases the dusting-on process (described in the same *Journal* for July 6 and 13) may be applied to the back of the plate. Reference is made to this form of intensification in the number for August 17. The idea seems to be gaining ground that the fading of prints fixed by hypo may be due to insufficient fixing, rather than to insufficient washing; and someone has lately published a method by which he says he secures permanent silver prints; the method consists in using the usual strength of hypo bath, but plenty of it, and the fixing of only one print at a time, after which the solution is thrown away; a fresh solution being used for each print.—*Journal of the Photographic Society of India*.

### Notes.

Photographers who indulge in excessive retouching have much to answer for. A case where the exaggerated beautifying of a portrait was the cause of much annoyance has lately come under our notice. A young girl had

mysteriously disappeared, and it was thought desirable that her photograph should be reproduced and circulated, together with a description of her dress. The only photograph which could be discovered was, however, one in which all character was destroyed by retouching, leaving nothing but an inane simper. The photograph had to be used, as it was a case of Hobson's choice; but as the friends of the girl scarcely recognised the likeness, it is hardly likely that strangers would be more successful.

A prominent place among the illustrated annuals will be taken by the English edition of the *Figaro* New Year number (*Figaro Illustré*), which has been issued at a price of 3/6 by Boussod, Valadon, and Co., of New Bond Street. In it we have some striking specimens of modern photographic block printing; and especially worthy of remark are the reproductions of florid modern French paintings in polychrome, by phototype blocks—"Chromotypogravure," the publishers call the process.

Another French illustrated work worthy of mention, is the catalogue of French New Year Books, issued by the Paris Library Club, and giving sample illustrations of the books referred to.

Our suggestion of a few weeks ago that some explanation of the technical terms used in a Photographic Exhibition Catalogue might be useful to the lay public, has, it seems, been anticipated by the management of the last Exhibition in St. Petersburg, and a correspondent is good enough to give us the following translation as an example of the sort of information contained in the glossary of technical terms:—"Platinotype—A process for obtaining photographs in which the image is formed by a salt of platinum instead of silver, as in ordinary prints on albumenized paper."

Speaking of a new illustrated guide to Eastbourne, the *City Press* remarks that it is "immeasurably superior to the dreadful photographic albums visitors to watering places desirous of taking away a permanent record of their visit generally have to be content with." What are these "dreadful photographic albums" which so exercise the minds of our contemporaries? As a rule, the photographs of most of our watering places are exceedingly good.

There is log rolling in photography as well as in literature. Here is a case in point. In the *Woman's Suffrage Journal* we have an enthusiastic notice of her own portrait by the editor, and the printing in full of the letter which accompanied the portrait. The letter runs thus:—"I have the honour to inform you that after twelve years of careful study I have at last discovered the art of reproducing the colours latent in the negative of the photographs, and I am now ready to accept orders from my patrons. . . . I arrived at my discovery by the aid of spectrum analysis, which led me to the conclusion that every colour in the organic world, when exposed to a suitable photographic film in a colour, registers exact vibrations, and I have succeeded in producing chemical colours extremely attenuated which exactly correspond with the vibrations in the



negative. In a word, I give nature fair play. She stamps her own image on the chemically-prepared tablet, and my function is to help, but not to supersede her."

This exquisitely modest effusion was immediately pounced upon by the *Globe*, which has always unblushingly puffed "photography in colours;" but the way in which the "inventor" patronises nature has been too much even for the *Globe* to swallow. It sarcastically remarks that the "discovery when first made public did not meet with universal acceptance. Cynical people sneered at it, the frivolous made fun of it, and, worst of all, the learned in chemistry declared that it had not been done, and what was more, could not be done. Nevertheless, it has obtained the approval of the *Woman's Suffrage Journal*, and that should be enough for anyone."

One naturally inquires what is the reason of the extraordinary change of tone which has come over the *Globe*. At one time it could not lavish too much sickly praise over the process. Now it seems to incline to pooch-pooch it altogether. Why also this jealousy of Miss Becker, who edits the *Woman's Suffrage Journal*? Can it be that the editor of the *Globe* is angry because Miss Becker has got her presentation portrait, and he has not got his?

In the *Observatory* for November, A. A. Common has an interesting article on photographing the nebula. One observation is worth quoting. He says: "The photographing of nebulae is remarkable as being almost the only actual modern achievement of photography; all else we can do now could be done in some form or other soon after the first application of photography to astronomy." If this be so, astronomical photographers must be sighing for new worlds to conquer.

A good many artists have taken up photography, and have found it enormously useful. In one case, however, it proved a stumbling block, rather than a help. The work of the artist in question chiefly consists of birds and animals, and he conceived the notion that photography would assist him. He accordingly took lessons, and having attained the needful proficiency, began to utilise his new-found skill. But as he afterwards told a friend, he dropped photography quicker than he took it up. "My dear fellow, I found that if I followed those confounded photographs, I should have to begin learning drawing all over again. I would not say whether I have been in the habit of drawing incorrectly, or whether it is the camera which is wrong; but all I know is, that if I went in for anything like the photographs I could not sell a sketch. I have been drawing birds and animals for so many years in a certain style, that the publishers and the public would not have any others. I had better leave photography to the new man."

The *Société d'Etudes Photographiques* have certainly reason to complain of the absurdly small amount of wall awarded to them by the commissioners of the exhibition. This, according to a statement made by the President at

the last meeting, amounted to but two metres, or a little more than two yards. We presume that this means running measure and not square measure, but even then it is little enough. The Secretary was requested to send to all the members asking them if desired to exhibit, and if, after the replies had been received, the committee thought the space was not ample enough, the commissioners would be asked to extend it.

At the last meeting of the Royal Astronomical Society Isaac Roberts read a paper describing an instrument he has devised for measuring the positions and magnitudes of stars on photographs, and for engraving maps of the stars on metal plates. The apparatus elicited the warm approval of the members of the Society, and also the usual diametrically opposed opinions, a characteristic feature of the Royal Astronomical Society's discussions. Thus, M. Ranyard thought that one advantage of Mr. Roberts' method was that the original negatives were in no way damaged in making a plate which would produce a great number of copies on which the smallest and faintest mark seen on the original negative could be shown. He also thought there was not the slightest danger of mistaking small photographic defects for stars. The President, on the other hand, considered there was a difficulty in distinguishing between a speck of dust and something which might really represent a star. He was likewise of opinion that when "we want to discuss the minutiae of the photograph, that we must trust to photographers' reproduction on glass." When the authorities disagree so vitally, the ordinary rank and file in the ranks of astronomy may well despair.

## Patent Intelligence.

### Applications for Letters Patent.

- 16,627. HERBERT EDWARD PALMER, 6, Barker Street, Villa Cross, Birmingham, for "An Easel Card Rest and Ticket combined for Photographs, Christmas, and other Cards."—November 16th, 1888.
- 16,710. HENRY NORRIS, 33, Stoke Newington Road, Middlesex, for "Improved Prepared Glass in imitation of Coloured, Leaded, Stained, Frosted, or Ground Glass, with or without Painted Designs thereon, and with or without an Improved Stand for the purpose of holding Photographs and other Articles therein, and for Improved Transparent Colour Varnishes for Decoration of Glass."—November 17th, 1888.
- 16,715. ARTHUR RICHARD BROWN, 323, High Holborn, Middlesex, for "Improvements in or Relating to Printing Photographs, especially blue printing, and in Apparatus therefor."—November 17th, 1888.
- 16,827. ALBERT TOWERS, 13A, Richmond Street, Liverpool, for "Improvements in Photographers' Printing Frames."—November 20th, 1888.

### Specifications Published during the Week.

- 1,510. RUDOLPH KRUGENER, of Bockenheim, near Frankfurt-on-Main, Germany, for "Improvements relating to Photographic Cameras."—Dated February 1st, 1888.

My invention has for its object the construction of a photographic secret camera, the mechanism of which is so arranged that it accurately fits in a casing which resembles externally, in a deceiving manner, the form and the appearance of a book, and from which neither the objective, the instantaneous cover, nor other inconvenient parts protrude, which might give rise to the belief that there was something else other than a book therein.

My said invention is illustrated in the accompanying drawing, the figures of which are hereinafter referred to.



The apparatus comprises two main parts, the camera proper which conceals the objective cover and plates, and the walls of which are made of sheet metal and the casing of pasteboard or leather representing the book. In the casing the camera is inserted, so that the part forming the backing of the book and containing the objective opening invariably protrudes.

The camera proper consists of a small sheet metal case, the two longitudinal sides corresponding to the backing and edge of a book are open. The said case is divided by two sheet metal strips, inserted crosswise, into three compartments. The one in the middle contains the objective, the upper one can be filled with twenty-four glass plates, each of which is placed in a small frame made of very thin sheet metal. They have a back wall, and the edges bent round and providing a hold for the plate prevent the coating on the back wall of the next small frame from being rubbed off. The coated side is turned towards the objective.

A helical spring *i* presses the small frame backwards firmly against a small board *a*, which closes one longitudinal opening of the sheet metal case. It is on one side provided with a depres-

the slide is placed somewhat deeper than the said ridges. This takes place when the slide has traversed the whole of its way. The strip *d* has taken hold of only one small frame, accordingly it serves, so to speak, as a hook, for by the ensuing downward movement by means of the rod *e* the small frame is displaced into the middle compartment, that is to say, into the focus.

The said frame is prevented from falling over by two springs or by two narrow guide slats. If it be the first frame, it is supported with its lower end upon the bent edge of a plate *h* that carries the helical spring *i*. If, after the exposure, a second plate is to be placed in the focus, the slide is pulled upwards. The hook-shaped strip *d* takes hold of a fresh plate by means of which the previously exposed plate is moved from the focus into the lower compartment, after having moved the bent plate *h* a little to the interior, or else the small frame, if one was already there, by pressing upon the knob. In the slit formed the small frame is moved, and it can, on the release of the knob *k*, be moved quite down. This operation is continued until all the small frames have passed from the upper compartment through the focus to the lower compartment.

The board *a* with the slide can be taken out, and the opening serves for filling and emptying the small frames. Two short pins provided in the sheet metal casing of the camera, and sunk into the wooden ridges *b* of the boards *a*, prevent the small frames springing out in the opening. Each of the said frames has upon the back a continuous number in black upon a white ground.

Through a small window *l* of red glass, which is specially covered by a slide, the exposures effected can be controlled.

The instantaneous closing device is placed in the backing of the book-shaped camera. It is moved between two small boards *t* and *u*, the latter of which, forming the outer one, is somewhat curved, and constitutes the backing of the book camera, thereby closing at the same time the second longitudinal opening of the small sheet metal case.

As the sensitive plates are only inserted in small frames, and not in boxes, light would enter the camera in the adjustment of the instantaneous closing device. A so-called safety slide *m* has therefore been arranged in the same. This operates in such a manner that it must be moved quite down, leaving the opening *n* entirely free, before the instantaneous closing device is disengaged.

Upon the slide *m* is secured a small pin *o*, which when the slide is entirely drawn up, is pressed against the inclined surface *p*, of a lever *q*, moving the latter to one side and disengaging a pin *r*, of the drop slide *s*. The sensitive plates used in the camera are cut from very thin plate glass, and are of exactly the same size and thickness, so that they always fit into the sheet metal frames.

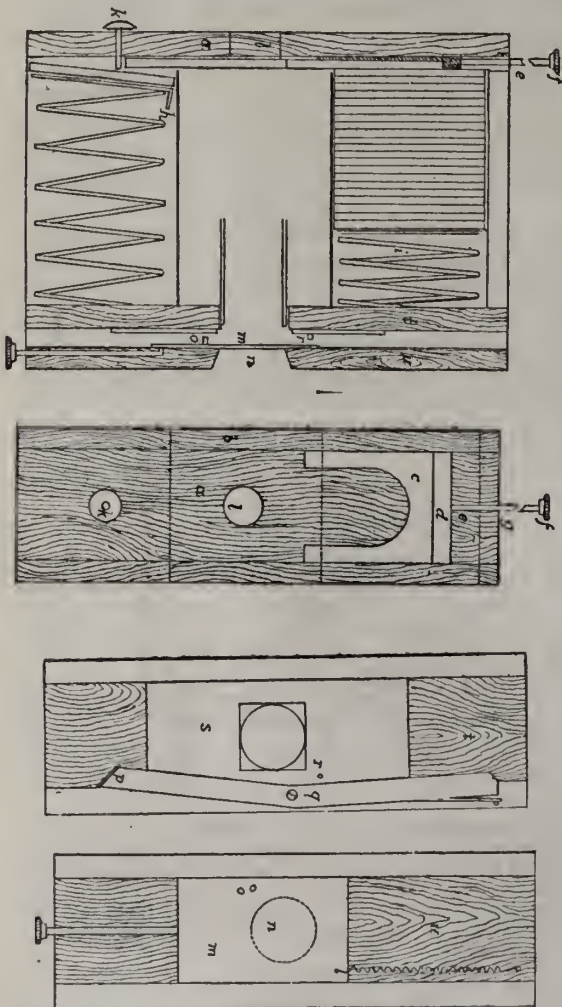
Having now particularly described and ascertained the nature of the said invention, and in what manner the same is to be performed, I declare that what I claim is:—

A photographic apparatus, comprising a receptacle which is divided by partitions into three compartments set in connection with each other and arranged on the side opposite to the objective, one of the said compartments serving for the reception of a number of prepared plates, the other for the exposition, and the third for the reception of the plates that have been exposed in combination with a slide which conveys the plates from one compartment to the other.

4,823. SAMUEL PHILLIPS, Photographer, and ADAM STEPHAN, Lithographic Printer, both of William Street, Woollomooloo, Sydney, in the Colony of New South Wales, for "Improvements in Photo-lithography, Photo-engraving, and other Photo-illustrative Processes."—Dated, 29th March, 1888.

This invention refers to improvements in photo-lithography, photo-engraving, and other photo-illustrative processes, by means of which a transfer, or medium, or a picture in fatty ink may be produced by printing from a photographic negative. By this invention the minutest detail may be directly transferred from the negative to a lithographic stone or stones, or to metals for etching or engraving, or to glass, porcelain, or other substances for similar purposes, or for ornament. By it also any print may be easily divided for chromo printing, and in each division the work will be as well brought out as if the print were taken from one stone or sheet.

These improvements in photo-lithography, photo-engraving, and other photo-illustrative processes, consist essentially in the use of a peculiar specially prepared sensitized transfer medium upon which a print of the negative is obtained in such ink that an impression of said print may be given upon a lithographic



sion in the longitudinal direction in such a manner that a small projecting ridge *b* remains on either side against which the plates are pressed. In the said depression a slide *c* moves, which carries at its upper end a projecting metal strip *d* of about four millimetres broad. To this strip *d*, which does not quite protrude to the extent of the cover of a small frame beyond the projecting wooden ridge *b*, is secured a steel rod *e* carrying a knob *f*.

If by means of this rod the slide is moved upwards the strip *d* slides upon the rear side of the small frame *g* until, being pressed by the helical spring, it slides down on the strip *d*, and can then bear against the wooden ridges *b*, as the other part of



stone, zinc, &c.; secondly, in the complete novel process of transferring a photo-negative illustration to stone, zinc, &c., &c., as a negative print or etching; and, thirdly, in the obtainment of a number of colour-stones, &c., from one photo-negative.

This transfer medium is prepared by first giving paper a coating or film of gelatine upon one surface, treating said surface with a solution of bi-chromate of potassium, and evenly coating it with a material which will protect certain minute portions, or dots, or lines, from the action of light, and thus giving grain to the coated surface; the most suitable material we have found for this purpose is stiff lithographic ink. It is now only necessary to expose to light the transfer thus prepared under the negative until the positive is seen clearly printed upon it. This print is then carefully inked, washed, and then developed by rubbing, when the ink, leaving the high-lights, allows the whole effect to be plainly seen. The transfer, being thus completed, may be used to obtain an impression on stone, zinc, &c., in any well-known manner.

But, in order that this invention may be clearly understood, the whole process of obtaining a lithographic print will be described in detail, it being understood that the obtainment of a metallic etching is proceeded with in a similar manner, and that the obtainment of a photographic print upon glass, porcelain, &c., may be had in negative by using the same process up to the transferring stage.

We prepare a bath consisting of one ounce of Nelson's patent opaque gelatine, or any good soft gelatine dissolved in, say, seven ounces of water for two hours, and to which is added, while at a temperature of about 100° Fahrenheit, say, two grains of chrome alum dissolved in half an ounce of water with or without, say, half a grain of tannin (to render the resulting transfer medium a little tougher), the whole being well strained. This bath being kept at a temperature of 90° Fahrenheit, a sheet of paper—preferably, thick photographic paper, or paper of similar description—is then carefully drawn over it under a scraper, pressing it in contact with the gelatine. When coated, this paper is then hung until carefully dried off, and is then rolled on a roller with a sheet of white paper over its prepared surface.

We next remove this prepared transfer paper into a dark room, and further treat it by floating it for, say, three minutes upon a solution of, say, three ounces of bi-chromate of potassium dissolved in, say, eighty ounces of water, and then dry it in a dark room having a well ventilated even temperature of about 75° Fahrenheit. Still conducting operations in the dark room, we now coat it with the semi-protecting material in the shape of stiff lithographic ink, but any material which will protect minute portions of the surface from the action of light would do. The ink we prefer is made up by mixing four ounces of beeswax, one ounce of spermaceti, half an ounce of tallow, and one ounce of lamp black, with about half the quantity of good lithographic printing ink. The inking is done in the ordinary way on a stone well rolled with ink, on which the prepared surface of the paper is pressed until evenly coated, at which stage, if properly done, a yellow face should show through the black ink, and, if examined with a magnifying glass, the surface should show a fine grain, and the transfer medium is complete.

The printing from the negative is carried out in the usual manner in a frame giving good contact, and preferably exposed in shadow until the shadows of the negative are well printed through the medium, when the print is placed over a stone and thin lithographic ink well rolled over it in a fine even coating. After a washing and thorough soakage, say, for about an hour in clear water, the development is effected by rubbing the print gently, over a flat surface, with a soft sponge, when the ink will come away from the high-lights, and the picture gradually appear until quite distinct; then, after thoroughly washing, it is again rubbed until the grain is quite clear, when it may be dried as complete.

To obtain the picture from the prepared medium on a lithographic stone, &c., the transfer is dampened on the back until the surface is quite sticky to the touch, when it is evenly laid upon the stone, sheet of zinc, &c., and with a roller forced into intimate contact, and then pressed to the stone, &c., in the usual manner; when removed a perfect picture will be found on the stone, &c., with half-tones and all degree of shadow clearly shown. If the impression is upon a stone it will be "gummed," "rubbed up," "etched," and printed from in the usual manner.

When making up colour stones in photo-chromo lithography, we print any number of these transfers in different depths from the negative, and these are transferred to different stones, one being the key and the others tints or parts; or parts may be

stopped or cut out on different stones, or parts cut out, scraped, and patched up for each different colour.

The transfer obtained as before described may, instead of being pressed upon a lithographic stone, be transferred by pressure to zinc, or other metals, or substances for etching or engraving in the usual manner, or it may be transferred to porcelain, china, &c., for ornamental purposes.

We would have it understood that we do not confine ourselves to any particular uses to which our invention may be applied, nor to the precise manner of carrying the same into effect so long as the nature thereof be retained.

Having now particularly described and ascertained the nature of this invention, and in what manner the same is to be performed, we declare that what we claim is:—

1. In photo-lithographic and such like processes the method of producing a grained transfer medium by coating a sensitised gelatine surface with thick lithographic ink or analogous partially protective substance, substantially as described.

2. The process for producing lithographs, etchings, or engravings, by the use of a grained transfer medium such as is referred to in the preceding claim, treated and applied substantially as described.

3. The process for obtaining a number of colour stones for photo-chromolithography by printing a number of transfers from one original, and treating them substantially as herein described.

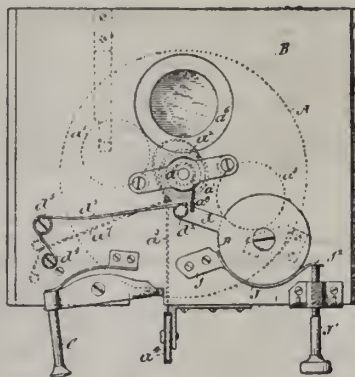
Patent stated in the Official Journal to have become Void by Non-payment of Duty. Non-payment of Fourth Year's Fee.

11,212 of 1884.—ROBINSON, J. V., "Photographic Cameras."

Patented in America.

392,194. WILLIAD H. FULLER, Passaic, N. J., assignor to The Scovill Manufacturing Company, N.Y., "Fly-shutter for Photographic Cameras."—Filed June 6, 1883. Serial No. 276,181. (No model.)

Claim.—1. The combination, with a fly-shutter, of a brake-wheel, a connection between the shutter and the brake-wheel, a spring acting on the brake-wheel for causing the movement of the shutter in one direction, a brake for the brake-wheel



and an adjusting device for the brake, substantially as specified.

2. The combination, with a fly-shutter, of a shaft upon which the shutter is mounted, a pulley on the shaft, a brake-wheel, a connection between the pulley and the brake-wheel for causing the movement of the shutter in one direction, a brake for the brake-wheel, and an adjusting device for the brake, substantially as specified.

## Correspondence.

### BLANCHARD'S PAPER "ON TONING DIFFICULTIES."

DEAR SIR,—Nowadays, when anyone who has been the proud possessor of a Lancaster camera for six months considers himself qualified to read a paper at photographic society meetings, or to write an article for a photographic journal, it is a treat to come across anything written under or over the name of some of the fathers of photography—men who were successful in overcoming the countless difficulties of the wet collodion process, and who



made themselves a name when landscape photography was really a hard labour, instead of a light amusement as it is at present.

It was with pleasure, therefore, that I read the article in to-day's issue of the *News* by Valentine Blanchard on toning difficulties. My own experience bears out most fully every word Mr. Blanchard writes, and I may add that when toning a small batch of prints I give two extra changes of water, and don't hurry the washing. Many makers of ready sensitised paper recommend the use of carbonate of soda in one of the washing waters. As I use a carbonate of soda toning solution I find this unnecessary. Possibly the toning bath I use, which I believe was modified from an old formula of Mr. Sarony's, may not be known to all your readers. It is easily made, and works more quickly than the ordinary acetate bath. Two stock solutions are kept. No. 1 consists of a fifteen-grain tube of chloride of gold dissolved in a two-ounce bottle full of water. No. 2 is one ounce of common washing soda (an impure carbonate of soda) dissolved in a half pint (ten-ounce) bottle of water. For use, one dram of each of these solutions is added to four ounces of hot water; and toning is proceeded with at once, before the water is cold. The mixed bath does not keep, and the tones given by it are warm browns. I have used it for about seven years.—I remain, yours, &c., J. P. GIBSON.

#### TESTING PHOTOGRAPHIC MOUNTS.

DEAR SIR,—Permit me to say a few words in reply to Mr. J. Spiller's able remarks on my paper, on the above subject, in your last issue. I quite agree with Mr. Spiller that, theoretically, backing the test print with a glass plate, instead of with paper, is preferable. I have used it, and continue to do so now, when the result of the test is likely to lead to litigation. Why I recommended the pad of paper as a backing was, that with it the print can be pressed into more intimate contact with the suspected mount than can be done with glass, owing to the intervening paraffined paper, particularly, as is often the case, if the surface of the card swells up and becomes uneven. Of course, in place of Joynson's writing paper, the Saxe or Rives paper might be used, and that would, perhaps, be a purer article.

I do not myself, as a practical test, attach very much importance to the necessity of extreme purity in the paper backing—except for the quibbles of a cross-examining counsel—inasmuch as the whole of the test print is exposed uniformly to its influence, if any; and, therefore, will not affect the result. If the paper next to the print contain a trace of antichlor, the conditions would be analogous, though in a minor degree, to the print itself being imperfectly freed from the hyposulphite of soda. But this will not vitiate the test, for, whatever be the condition of the print, if that portion of it which is in contact with the suspected mount fades or becomes stained before that part which is protected from it, the mount must be the cause.

The object of my short paper, as I explained, was to put photographers in possession of a simple and practical means of protecting their reputation against some of those pernicious mounts now in the market, as well as to help to sustain the credit of photography itself—a subject I know our friend, Mr. Spiller, has quite as much at heart as I have myself.—Yours very truly, E. W. FOXLEE.

22, Goldsmith Road, Acton, W.

#### Proceedings of Societies.

##### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

At the technical meeting of this Society held on Tuesday evening last, the 27th inst., the chair was occupied by JOHN SPILLER.

The ASSISTANT SECRETARY read a letter that had been sent by J. Lendon Berry, of Aberdare, accompanying two negatives upon which certain markings were visible, concerning the origin of which he had formed a theory, but requested the opinion of

the members of the Society thereupon. In the course of the letter, it was stated that the particulars, as well as could be remembered, were as follows:—One gloomy afternoon in November of last year, a sitter had been posed wearing an evening dress suit with the usual large white frontage, and the light being dull, the full aperture of the lens, a Dallmeyer portrait lens of the kind fitted with diffusion of focus arrangement, was employed, with exposures on two gelatine plates of commercial manufacture of twelve seconds and eighteen seconds respectively. After exposure they were placed in an ordinary pine plate-box in adjoining grooves. The plates had been developed with the ordinary pyro solution side by side in one dish in the dark room, which was lit by a lamp well screened, and no unnecessary exposure of the plate allowed. When the images began to appear in about the usual time, one negative had its head towards the operator, and in the other the head was in the opposite direction, proving that they had been in that position in the box with regard to each other, and at the same time they must have been face to face, although separated by the thickness of one groove of the box. As development proceeded the marks above the head in the negative made their appearance simultaneously with the image, and upon reversing the negatives, and placing the films face to face, it would be seen that these marks coincided with the shirt front of each negative. The writer accounted for the marks by supposing that the image of the shirt front had, on account of long exposure, stored up a quantity of light in the same way as does an article coated with luminous paint, and had given off in the plate-box sufficient actinism to impress that part of the other plate which happened to be opposite to it, and which had at the same time received but little action of light, being in the background, and that a dark one. For this reason the action was more apparent than would have been the case with a light or figured background. The writer had not met with a similar experience before or since, although he always stored his negatives in the same manner after exposure, and developed the day's work at night. He further observed that the markings could not be due to any action of the lens, as that would have produced an image in the same direction as the chief image, whereas this ghost or secondary image was in the contrary direction. The writer concluded this letter by remarking that if his theory was correct, and that one exposed plate was capable of impressing another that happened to be in front of it, it would go far to explain the appearance of ghosts that had been in the habit of troubling photographers, and, further, that it pointed to the desirability of having separate divisions in the plate-boxes, instead of mere grooves, so as to keep off the action of stored up light.

The CHAIRMAN noted that the marks did not come opposite to the shirt front when the plates were level and opposite each other, as they would ordinarily be in a grooved box, but that in order to get them to fit, one plate had to overlap the other considerably.

The plates sent being handed round, W. E. DEENHAM said that it was not necessary to suppose a phosphorescent action of the plates to account for the marks, or even to assume that the resemblance of the shape to that of the shirt front was other than an accidental coincidence. If there were a small hole in the side of the plate box, the image might take any form depending upon the light of the dark room, and would in this case, if it penetrated the two plates, show, as in this instance, on the same part of the plate when the heads were placed one way. With regard to the statement that the heads being in reversed positions in the developing dish proved that they had been in reversed position in the plate-box, he thought that that was supposing too much, unless special note had been taken at the time of placing them in the dish, which did not appear to have been done. It was such a usual thing for tourists to keep their exposed plates in grooved boxes for some time before development, that if this phosphorescent action existed to the extent suggested, enough to account for the markings on the plates under discussion, it would in all probability have been noted, and been recognized as a fact with which we had to deal, especially as the skies would represent a much greater amount of light than that emanating from a shirt front.

W. ENGLAND suggested that the marks might be part of a secondary image, formed by a hole in the camera front.

CHAPMAN JONES thought that the secondary image might be due to reflection from the surfaces of the lenses forming a ghost image. He suggested that the camera and lens which had been used should be pointed to a gas flame, and then the image being displaced a short distance from the axial line, it should be noted



whether an inverted ghost image showed itself upon the focusing screen.

H. J. BURTON showed a clip of new design in which the spring was of stout wire, and the ends of the wire being bent round the wood, served the purpose of the usual hinge arrangement.

The CHAIRMAN thought it an improvement on the clips at present in use.

A short discussion then took place on the celluloid flexible films for supporting negative emulsions. Celluloid being perfectly indifferent to aqueous solutions, does not cause any difficulty by expansion during development.

Thanks having been accorded to the writer of the letter, with accompanying negatives, that had occupied the early part of the evening, the meeting shortly afterwards adjourned.

#### BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE annual meeting was held at the Technical Schools, Bridge Street, on November 22nd, E. H. JAKES, Vice-President, in the chair.

J. H. Archer, W. Caswell, and G. Owen were elected members.

The HON. SECRETARY read the annual report, of which the following is an abstract:—"Your Council have much pleasure in submitting their fourth annual report, and in stating that the progress made during the year has been very satisfactory. The register of members shews a total of 204 after deducting resignations and removals for various causes, as against 144 at date of last report, showing an increase of 60 during the year. The average attendance at sixteen ordinary meetings has been 53. [The report then gave a list of papers read and special exhibits during the year, which have duly appeared in our columns.] Your Council has decided for the annual exhibition and competition to be held on December 13th, and special rules for regulating these exhibitions and competitions have been approved, and forwarded to each member. Much useful information has been afforded through the question box. Members are reminded that it is of great assistance and mutual benefit to inspect special apparatus, negatives, and prints, and hope more will be brought to the meetings. The Photographic Convention of the United Kingdom accepted the invitation of this Society to visit Birmingham this year. A local committee was formed almost exclusively from this Society. The Convention was opened by the Mayor of Birmingham (Alderman Pollack) at a conversation held on July 23rd, when about 500 members and friends were present. Excursions were made each day to places of interest in the district, and lantern views were shown on the screen each evening previous to the excursions for the following days. Your Librarian reports that members are availing themselves more of the use to the Library. Your Lantern Committee report progress in number of slides belonging to the Society, which now number 240, and it was felt some system of catalogue and methodical labelling was required. Accordingly they have provided a registration book embodying all particulars of pictures, including make of plates (useful for future reference), with progressive number affixed to the slides. A special room has been engaged during this session for lantern display, and a charge made for non-members, and the proceeds to be handed to the Treasurer for Lantern Fund for purchasing a first-class lantern. The Committee think that a good collection like these American slides would be of greater interest to members if furnished with a fuller description of the views than that supplied in this instance, and specially if arranged as a representative series of the charming country to which they belong." The report, after acknowledgment of favours received from various sources, closed with a summary of the income and expenditure of the Society duly audited, which showed liabilities nil, and assets £42 5s. 7d., including cash in hand, £20 8s. 7d.

The CHAIRMAN then read a letter from the President (R. H. Norris, M.D.), in the course of which he wrote:—"I regret that continued illness prevents me being with you on the occasion of our annual meeting. It would have given me great pleasure to have recounted to you the victories and success of our last session, which has been in many respects an exceptional one of which we may justly feel proud, for not only has it resulted in a great impetus to our own Society, but to the progress of photography generally. I allude, of course, to the meeting of the Photographic Convention of the United Kingdom, which has been regarded on all hands as a success worthy of the efforts and labours of its promoters. During the past session the papers read to the Society have been of considerable interest. As our members 'feel their feet,' I am in hopes of seeing

them attack some of the deeper problems of photography during next year. I trust we shall have papers on 'Orthochromatic Photography,' which is to-day a burning question. Others on such topics has chemical *versus* physical developments; the nature of solarization or reversal; the value of the yellow screen in foggy weather; the precise rôle of the individual agencies concerned in development; the nature of the latent image, weak *versus* strong light, &c. We want to be a wee bit more scientific. The chemistry of plate making should in my opinion also receive a little more attention and discussion, and members should be encouraged to occasionally make their own plates or films, so that they may obtain a more rational and intelligent conception of the process. Now-a-days it is the fashion to begin at the exposure, and thereby lose all the education and excitement which pertain to the chemistry of the process. Some of the prizes should be given, I think, to the best out-and-out productions as we may term them. These are questions which the council cannot altogether control; they rest mainly with the members of the Society, and I am quite sure there are many members quite qualified to undertake original experimental work. You will see these remarks are a plea for new knowledge, which is the great lever of progress in all departments of human knowledge."

The CHAIRMAN made a few remarks regretting the absence of the President, and trusted a short time only would elapse before he was amongst the Society work again.

After passing certain alterations to existing rules, the election of officers was proceeded with, and the results of the ballot was as follows:—

President—R. H. Norris, M.D.

Vice-Presidents—E. H. Jakes, E. Karleese, W. J. Harrison.

Treasurer—Thos. Taylor. Librarian—S. J. Holliday.

Council—F. Barnett, J. J. Button, J. C. Fowler, F. Hoskins, S. G. Mason, E. C. Middleton, A. Pumphrey, G. A. Thomason.

Honorary Secretaries—J. H. Pickard, Wm. Rooke.

On the 20th inst., at a special meeting of the above Society, Mr. BELL SMITH, of the Eastman Co., gave a demonstration of their Stripping Films, Transferotype, Bromide Paper, &c. There was a very large attendance. The lecturer practically illustrated his paper with the whole details of the various processes, and afterwards explained the working of the "Kodak" camera.

#### NORTH LONDON PHOTOGRAPHIC SOCIETY.

An ordinary meeting was held on November 20th, at Myddelton Hall, A. MACKIE in the chair.

R. F. Brickdale, W. Watson, and M. C. Wood were elected members.

A number of specimens of home portraiture, by the Chairman and other members, were passed round, and a short discussion took place on matters suggested thereby.

The CHAIRMAN said he had to announce with regret that their President was unable to be present that evening to read the paper on "Dissolvers for Single Lanterns. On the present occasion a discussion would be invited on lantern matters generally.

In opening the discussion the CHAIRMAN desired to impress the importance of the slides being marked according to the standard method, which was "a white line along the top, or a white spot in each of the top corners of the slide when held so that the picture appeared as in nature." Some slides had been handed in that evening which were marked in no way whatever, and on inquiry being made why they were not marked in the standard way, the owner had replied that he did not know there was a recognized method. He (the Chairman) must express some surprise at any member of the Society pleading ignorance on that point. To mark the slides properly was a duty owed to the exhibitor, for it saved him an enormous amount of trouble as well as to the audience, as nothing was more annoying than to have slides appear on the screen upside down or the wrong way round. Another matter of importance was to have the slides sufficiently warm to prevent condensation of moisture while in the lantern, and as it was not always practicable at the place of exhibition to warm the slides, especially in the limited time there was generally at command, he would recommend members to warm their slides before leaving home.

L. MEDLAND pointed out the inconvenience and difficulty of distributing the slides to their various owners at the end of the entertainment, when the bindings were of the usual uniform black. He advocated that colours should be used for the bindings, each individual choosing his own and binding all his slides that colour. Of course there were not sufficient colours for



every one to have a distinct one, but even if two or more exhibitors happened to have used the same colour, the inconvenience would be much less than at present. He had bound all his slides a deep red, and never had any trouble, therefore, in picking them out.

A. C. COSSOR asked the best method of making lantern slides from larger negatives by artificial light.

The CHAIRMAN explained the method he adopted for reducing to lantern size by daylight. He used a large camera, in the dark slide of which the negative to be reduced was placed; a small camera, the lens of which was pointed through the lens aperture of the large one, being used for the sensitive plate. The whole arrangement was fastened to a board which was tilted to obtain skylight without obstruction. He thought a similar arrangement would be successful with artificial light if a diffuser of paper were placed a few inches from the negative, the source of illumination being, say, two paraffin lamps. In reducing, it was a matter of importance to mask off all light except that passing through the portion of the negative required.

A sheet of opal glass having been suggested as a diffuser, J. JACKSON said opal glass stopped a very large amount of actinic light. In his dark room he used an opal globe to the gas, and one thickness of thin yellow paper. He found this a safe light for developing bromide paper.

In reply to a question whether an optical lantern could be used for the illuminant, E. CLIFTON said it would answer admirably. An evenly lighted disc a little larger than the negative would form the best means of illumination that could be used.

W. Bishop, J. Jackson, and other members also took part in the discussion, after which a number of interesting slides were exhibited by means of the optical lantern, among them a series by Mr. Dunsterville, of Madras, who is a member of the Society.

The next meeting will be held on December 4, when J. Traill Taylor will read a paper on "Dissolvers for Single Lanterns."

#### CAMERA CLUB.

ON Thursday, November 22nd, W. BEDFORD read a paper entitled "Some Few Misconceptions concerning Orthochromatic Photography." WILSON NOBLE, M.P., occupied the chair, and in introducing the lecturer, expressed the appreciation which was generally felt at Mr. Bedford's kindness in bringing forward so interesting a subject at so short a notice, W. Cadett's address on Development having been compulsorily postponed to December 20th.

Mr. BEDFORD referred to some half-dozen prominent points in orthochromatic photography, concerning which misconceptions were entertained; and in doing so he very ably covered the ground relating to the subject.

A discussion followed, in which the Chairman and Messrs. Gotz, Webber, Clark, Greene, Sturmyer, Davison, Rodgers, and Mackie took part. Illustrations bearing on the subject under discussion were kindly lent or brought by the lecturer, by Messrs. Edwards and Co., Mr. Gotz, and Mr. Webber.

The subject for Thursday, December 6th, will be "Single and Stereoscopic Hand Cameras," when a paper will be read by E. R. Shipton. Slides from negatives done by various makes of hand-cameras will be put through the lantern, and a selection of stereoscopes and stereoscopic pictures will be on view.

#### DEVON AND CORNWALL CAMERA CLUB.

A MEETING of this Club was held at the Freemason's Hall, Cornwall Street, Plymouth, on the 21st inst., J. PODE in the chair.

Miss Tatham, J. Brooking Rowe, E. H. Micklewood, W. Luxon, P. L. Norrington, A. R. Norrington, and N. Hearle were elected members.

A. A. CARNELL gave a demonstration upon "Stripping Films" which was most attentively listened to. In the course of his remarks, he pointed out that the process was not so difficult as it appeared from reading the directions sent out. He much preferred using French chalk instead of india-rubber solution, to prevent the film sticking to the glass plate. The former was cheaper, cleaner, and more easily worked. There was no necessity to float the film over the glass plate; it could be laid down and squeezed to it, a piece of rubber cloth having been first placed over the film. The skin was also squeezed to the film, but without the interposition of the rubber cloth. He also pointed out that very little developer was required with films. He used only 1½ ounce, being one ounce of that recommended by the Eastman Company, diluted with half an ounce of water. This he found ample for the development of a whole-plate negative.

In answer to queries, Mr. Carnell said that although films were slightly more expensive than those plates which he had tried, he thought he was well repaid by the result. He acknowledged that the cost of the roll-holder at present was excessive, almost prohibitory, and deterred many persons from trying the films. If the Eastman Company could see their way to a considerable reduction in the price of the roll-holder, the increased sale of films would soon recoup them, and glass plates be almost driven out of the market.

A number of film negatives were passed round for inspection and comparison with paper ones and others.

A vote of thanks was given to Mr. Carnell for his demonstration.

The next meeting will be held at the same place on the evening of the 5th prox.

#### NOTTS AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE fortnightly meeting was held in the Cavendish Chambers, Market Street, on the 26th inst. The room was again very attractive in appearance, the walls being decorated with lace curtains and frames of photographs, the latter being the work of members. Over a hundred ladies and gentlemen were present.

In opening the proceedings, the President, HENRY BLANDY, expressed the gratification it was to see so many lady friends present. It was by special request that the present meeting had been arranged; the previous lantern entertainment, given by their vice-president on the occasion of the visit of the Derby Association to their rooms, being so highly eulogized among the friends of the Association, that it had been decided to repeat it.

There were then shown on the screen a series of slides illustrating the Rhine, embracing views of Cologne, Bonn, Seven Mountains, Andernach, Coblenz, Ehrenbreitstein, Boppard, St. Goar, The Lorelei, The Mouse Tower, Mayence, Frankfurt, Mauheim, &c., &c.

After the lantern entertainment, the ordinary business of the Society was transacted, when the following gentlemen were proposed as members:—W. Towers, J. Middlebrook, J. Plant Holroyd, F. Gell, and T. Ellis.

The next meeting of the Society will be held on December 10th: "Experiments on the Flash Light."

#### PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A MEETING was held November 7th, Vice-President JOHN G. BULLOCK in the chair.

WILLIAM H. RAU, director, representing the Society in the American Lantern Slide Interchange, reported that the Society's quota of slides had been sent to the executive committee, who had selected therefrom 97, which would be sent on the circuit of the various organizations connected with the Interchange.

The executive committee of the interchange had selected, from the slides for 1886-7, two hundred to be sent to England in exchange for the same number to be sent to this country. Fifty-seven of the slides selected for the purpose were the work of fourteen members of this Society.

Mr. STIRLING made the announcement that, on behalf of Mr. George W. Childs, the pleasant duty devolved upon him of presenting to the Society a set of the Muybridge plates illustrating animal motion, reproduced from the instantaneous photographs recently made under the auspices of the University of Pennsylvania. In making the presentation, Mr. Stirling referred to the great scientific and artistic value of the work, and said it had been Mr. Childs' desire that this copy of it should be in the hands of some permanent organization to which it would be of value.

Mr. CARBUTT showed his new flexible negative film, intended as a substitute for both glass and paper negatives. The films are but one one-hundredth of an inch in thickness, and can be printed from either side. They weigh about the same as paper, or about one-twelfth as much as glass. They can be used in any ordinary plate holder, or in special thin holders made for the purpose. The manipulation of exposing, developing, fixing, washing, &c., are performed exactly as with glass plates. The difficulties and inconveniences of paper negatives and stripping films are entirely voided. Mr. Carbutt also showed a holder devised carry twenty-four films. By use of a changing bag, after exposure each film was removed from the front to the back of the holder, a fresh film being brought into position ready for the next exposure.

Mr. BARTLETT presented to the Society, on behalf of Mr. McCollin, an improved ignitor for use with flash-light compounds, of compact and convenient form. He also brought to



the attention of the members an improvement in mercurial intensification of negatives. When, after bleaching with bichloride of mercury, a solution of sulphite of soda is used, if left too long in the second solution the negative becomes reduced in density. If the sulphite of soda solution, which is usually alkaline, is rendered neutral with sulphuric or other acid, this reduction will be prevented, and the intensification will continue to the point desired with an improvement in colour.

Mr. SUPLEE called attention to a report, lately published in the London journal, *Engineering*, of a discussion of the Physical Section of the British Association for the Advancement of Science, at the meeting held at Bath. But for the distinguished body before whom the matter was brought, and the serious manner in which it had been treated, the report would seem like a fairy tale, and not worthy of consideration. It read as follows:—"Mr. Friese Greene's paper 'On a Photographic Image of an Electric Arc Lamp probably due to Phosphorescence in the Eye,' is a contribution of singular interest. Mr. Friese Greene actually exposed a sensitive plate to the light issuing from his eye, and photographed with it. He stared at a 3,000-candle arc lamp in Piccadilly, at a distance of three feet only, for fifteen seconds, closed his eye and brought it rapidly over the sensitive plate within one inch distance from the film. Thus he obtained a very faint yet distinct image of the arc, the two carbons, the image of the arc and the reflector, and also a faint indication of the cone. A second attempt failed. The arc probably produced a bright spot on the retina, which remained luminous for a moment after the lamp had been shut off. One remarkable circumstance of this novel mode of photographing was pointed out by Mr. Shaw: 'The image is in focus, so that the focus of the eye must have changed most rapidly.' Several speakers would have liked to suggest a continuation of these experiments with a weaker source of light, less deleterious to the eye; but Mr. Greene had failed to obtain any effect with gas lights."

JAMES WILSON showed a lens mounted in aluminium instead of brass, reducing the weight two-thirds. He also showed a lens fitted with Bausch and Lomb's Iris Diaphragm Shutter for time and instantaneous exposures.

Mr. TRUSCOTT, a visitor, showed a lens fitted with an adjustable mount, which enabled the glasses to be brought more or less close together, thereby changing the angle of view. A lens by Steinheil of 3 inch focus and extreme wide angle was shown. The lens would certainly cover a  $6\frac{1}{2}$  by  $8\frac{1}{2}$  inch plate, and probably 8 by 10. He also exhibited one of Steinheil's Group Anti-Planatic Lenses, No. 2 series, an extremely rapid lens, as testified by some excellent prints of a base ball field with the players in most rapid motion.

#### THE DAVOS AND ST. MORITZ PHOTOGRAPHIC SOCIETY.

The annual general meeting of the Davos and St. Moritz Photographic Society was held at Hotel Buol, Davos, Switzerland, on Wednesday afternoon last, and was remarkably well attended. The chair was taken by Mr. Gardner-Waterman, who explained the manner in which the Society was carried on during the last winter season, and also in what particulars it might be advisable to make alterations in the rules with a view to encourage the efforts of beginners, and generally increase the scope of the Society and the number of exhibits. Numerous amendments having been fully discussed, the rules as altered by the meeting were agreed to and ordered to be printed. In accordance with these, two subjects will be named by the committee, for illustration every third week. The photographs contributed will be circulated amongst the members, who can vote by ballot upon those eligible for competition, and they are invited to make remarks and suggestions upon them all. Two prizes will be given at the end of the season. In order to put new members and those commencing photography on some sort of equality with the older members, the competition is limited to pictures taken after the annual general meeting; but members are also asked to send in prints to illustrate the subjects, irrespective of the time at which the work was done. A very good new rule is, that if a member do not send in a photograph on either of the fixed dates, the portfolio containing the three-weekly contributions to which he has not added will not be sent to him. The subscription remains at three francs. The following were elected to act as the committee:—Messrs. W. Gardner-Waterman, A. Herbert, and N. C. Young. Mr. Read most liberally offered a special prize, the work competing for which is to be judged by its photographic excellence. He gave some idea as to the conditions of the competition, and asked for the views of the

members with reference to its date. A cordial vote of thanks was unanimously accorded to him, and it was decided that he should confer with reference to holding meetings for purposes of mutual instruction and interchange of information upon photographic matters, and the committee were directed to endeavour to arrange them. The prospects of the Society for the ensuing season appear most promising. The object of the Society is to bring to bear the influence of art upon photography.

#### Rules.

1. The Society shall be called the Davos and St. Moritz Photographic Society.

2. An annual subscription of three francs shall be paid by each member.

3. The affairs of the Society shall be managed by a committee. Such committee shall consist of two members, and the secretary and these shall be elected at the annual general meeting, which shall be held on, or soon after, the 1st of November in each year.

4. A list of subjects of periodical illustration by the members, together with the dates of contribution, shall be issued by the committee within a week after their election.

5. All contributions must be the individual work throughout of the contributor, and must be sent in punctually to the secretary, together with the contributor's name and a notification as to the subjects they are respectively intended to represent, and which of them (if any) are intended for competition.

6. No photograph shall be eligible for competition unless it shall have been taken subsequently to the annual general meeting, and shall not have previously appeared in one of the Society's portfolios.

7. Every member must, on each of the appointed dates, contribute at least one photograph illustrative of the subject, or one of the subjects, named by the committee for illustration on that date.

8. No signature or other distinguishing mark must appear on work intended for competition, and no contribution must exceed the size of the portfolio (17 by 23 inches).

9. A portfolio containing the contributions of each separate date will from time to time be circulated among the members in succession. Each member must write against his name on the list accompanying the portfolio the date of its receipt and despatch, and must send it on to the member whose name is next below his own. Any member not forwarding a portfolio on the day subsequent to that on which he shall have received it will be fined half a franc.

10. If, and so often as any member fail to comply with Rule 7, the portfolio to which he shall not have contributed shall not be sent to him, and he shall not be entitled to vote upon the contributions therein unless he shall have paid a fine of one franc before the portfolio ought, in the ordinary course of circulation, to have been returned to the secretary.

11. Every member may give three votes upon each of the subjects named by the committee. These three votes must be divided between the two best competing photographs illustrating the subject. No member shall be compelled to vote or to give the maximum number of votes. Votes shall be recorded by the member filling up one of the voting forms (a supply of which will be circulated with each portfolio), and securing the same from observation by enclosing it in an envelope which must be placed in the pocket of the portfolio.

12. At the close of the season two prizes will be awarded; viz, one to each of the members who shall respectively have obtained the highest and next to the highest number of votes.

13. Every member may write *bona fide* criticisms, suggestions, or queries upon the photographs or any other matter connected with the Society, but the same must be enclosed in the envelope containing his voting paper, or otherwise secured from observation, and shall not be disclosed until the whole of the votes upon the portfolio to which they relate shall have been recorded.

14. Any matter not provided for by these rules shall be in the absolute discretion of the committee, whose decision shall be final.

The honorary secretary, Arthur Herbert, Villa Vecchia, Davos-Dorf, will be pleased to give all information respecting the Society and to receive the name of anyone wishing to join.—*From the St. Moritz Post.*



## LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The ordinary weekly meeting was held on the 22nd inst., J. TRAILL TAYLOR presiding.

A demonstration of ferrotype was given by S. G. B. Wollaston. Two negatives were exposed to gaslight for 100 seconds at three feet distance, and 90 seconds at two feet six inches respectively. The films were then removed from the frames, and soaked in water for a short time, when they were ready for development. The ferrous oxalate developer was used, one part in six of saturated solution slightly acidified with acetic acid, ten drops of a 10 per cent. solution of bromide being added. The demonstrator preferred also adding a little old ferrous oxalate developer; it gave a better character to the image, and kept the whites clearer. Three washes in acidulated water were then given, and the films transferred to the fixing bath; this should be quite fresh. The films should be allowed to remain in the hypo bath some little time after apparent fixation. The transfer of the film is effected by bringing them in contact with the mount under water; they are then squeezed and left under pressure for some time, after which, by the application of hot water, the soluble substratum is dissolved, and the films readily part with their support.

Several opals, upon which films had been transferred, were passed round.

The CHAIRMAN remarked upon the necessity of thorough fixation; to effect this a sufficiently long immersion should be given to remove any hyposulphite of silver formed.

W. WALLIS asked if it was not a condition that the fixing bath should be always neutralised.

A. COWAN considered that the addition of ammonia to the fixing had improved the colour of the image.

The CHAIRMAN remarked upon the probability of the soluble substratum becoming insoluble by long contact with the sensitive film, which had been treated presumably with chrome alum, and thus prevent their being stripped.

S. G. B. WOLLASTON said, in his experience with films it was not unusual for him to find films obstinately refuse to yield to any of the dodges with which he was acquainted for stripping. In cases of this kind he had invariably traced the cause to either heat or damp.

A MEMBER thought the cold tone of the print an objection.

Mr. WOLLASTON said immersion in a bath of weak hydrochloric acid would impart a warm tone.

H. STARNES had improved the tone of pure bromide prints with a bath of weak hydrochloric acid and perchloride of iron. The prints were then washed, and transferred to a platinum bath.

The CHAIRMAN read an extract from a communication from W. K. Burton, of Tokio, Japan, to a member of the Association, to the effect that some relics had been recently unearthed in Japan, and that the Government there had instructed him to take photographs of them, and to print 40,000 copies of them in platinotype.

H. M. HASTINGS showed an apparatus for burning magnesium ribbon; the ribbon was wound on a roller enclosed in a small circular box, and worked between two friction rollers by the first finger of the hand holding the apparatus.

H. S. STARNES exhibited some chloride transparencies printed out.

A. HADDON passed round some prints on Alpha paper, printed by moonlight in thirty-five minutes from the negative exhibited at the previous meeting, which had also received a moonlight exposure.

The CHAIRMAN showed a transparency produced fourteen years ago, that he believed was the first one made on a gelatine plate.

A vote of thanks to S. G. B. Wollaston closed the proceedings.

## Talk in the Studio.

PICTURES IN BLACK AND WHITE.—By GEORGE MASON.—Here we have an attractive little book containing cleverly written sketches of studio life and character, most or all of which have appeared in the *British Journal of Photography* over the *nom-de-plume*, Mark Oute. Mr. Mason is to be congratulated on the attractiveness of his little book, illustrated as it is with numerous wood-cuts. The book is published by Henry Greenwood & Co., of 2, York Street, Covent Garden.

BEEN THERE HIMSELF.—Magistrate: "What is the charge

against this man?" Officer: "He threw a photograph lens at a baby and cut its head." Magistrate: "Are you a regular photographer?" Prisoner: "Yes, your honour. I had been trying for two mortal hours to take a picture of that little imp—I mean little baby, your honour, and—" Magistrate: "You are discharged. I used to be a photographer myself." Prisoner: "Thank you, sir, your honour."—*Philadelphia Photographer*.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—On the 6th prox., Mr. Willis will illustrate the practical working of the "Cold Bath Process."

PHOTOGRAPHIC CLUB.—The subject for discussion on December 5th will be "Preparation of Gelatino-Bromide Paper."

## To Correspondents.

\* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.," while Advertisements and Business letters should be forwarded to "PIPER AND CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

TEINBRIDGE.—We have not used the particular make of paper referred to, but believe it to be a gelatine emulsion paper. If so, we are inclined to think it probable that the prints on it will, on the average, last longer than those on ordinary albumenized paper.

T. WILLIAMS.—A lens of the type you mention, having an equivalent focus of about 12 inches, will be a very suitable instrument for your purpose, although, if you only want the animal sharp, and do not care much about the surroundings, you may find a portrait lens with full aperture more suitable, as it will work in about one-third of the time. 2. Depth of focus can hardly be expressed in linear measure as you put it, but with the lens and aperture you speak of, the limits of reasonably good definition will hardly exceed one-thirtieth of an inch. 3. You can easily find a position at which it will give an image an inch high, but if the object is nearer to the lens the image will be larger.

AMATEUR.—If the spots are due to a fungoid growth, the best way is to sponge the surface over with methylated spirit to which a little carbolic acid (20 drops to each ounce) has been added. If, on drying, there is any local roughness, it is well to varnish the surface. 2. Silver stains of the sort you refer to are difficult to remove, and there is considerable risk of spoiling the negative; but one of the best things to do is to soak the negative in a dilute solution of cyanide of potassium. Commence with a strength of about three grains to an ounce.

J. BRIGGS.—You can probably obtain them from W. M. Spooner, 379, Strand, London, or Mr. Evans, 44, Duncannon Street, London.

PHOTARGUS.—1. There is no occasion to return the number. 2. Any diaphragm shutter, working in the diaphragm and adjustable as you require it, must, of necessity, be a finely made and delicate piece of mechanism, and will be altogether put out of service by a very small trace of dirt or grit. The new iris diaphragm shutter of Dallmeyer is a very fine piece of mechanism, and acts admirably.

J. P.—It is quite evident that the film is unequally hard, either from the cause you mention, or some other. Try long soaking in water before treatment.

B. S.—We admit no letters unless signed by the full name of the writers, so yours is not inserted. If, however, you like to back your statement by whatever weight your personality may carry with it, the letter shall be published next week. Correspondents who desire to be answered in this column may write to us anonymously, as, in each case, our answer only has reference to the question as stated in the communication.

L. BATCHELOR.—1. The firm is still in existence, and carries on business at the same address. 2. It is a matter which in no way affects the course of action which we take.

DARK ROOM.—Small and low-priced dynamos which will work four or five of the two-candle lamps can now be had for three or four pounds, and, ordinarily, they do not consume so much power as to affect the working of such an engine as you describe. There is a shop where such things are sold on the north side of Curator Street, and another on the east side of Waterloo Road. We should suggest that, before purchasing, you should try the machine with the lamps you intend to use.

LITHO. DRAUGHTSMAN.—The Husnik paper is perhaps the most suitable, and we are under the impression that it is obtainable from Marion, of Soho Square; if not, you can obtain a few sheets by post from Ed. Liesegang, of Dusseldorf, Germany. Your best way will be to send a P.O.O. for a few shillings, and ask him to send paper to value.

C. CATHERTON.—1. We cannot give you a useful answer on such vague information. 2. In this case, the marks are undoubtedly due to imperfect fixation. The hyposulphite solution may have been cold, cold being always produced during the dissolution of the crystals. The prints may not have remained in the bath a sufficient time, or the solution may have acted imperfectly for want of frequent separation and shifting of the prints.



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## HYDROKINONE DEVELOPMENT.

### SECOND ARTICLE.

WHEN referring last week to the newly-awakened interest in hydrokinone as a developer that is being displayed in Germany and France, mention was made of a work on this subject by G. Balagny, which has just been published by Gauthier-Villars, in Paris. As Balagny's method of proceeding is somewhat different from that which has hitherto been customary, we think it desirable to indicate the principle upon which he works. A leading feature with him is to have two stock developing solutions, one of which is fresh, or rather, has not previously been used; the other consists merely of a developer which has already served for several plates. These solutions he mixes in various proportions, or employs singly, according to the character of the work which they are required to perform.

Balagny's formula for a hydrokinone developing solution is very like that quoted last week from Vogel, in the relative proportions of hydrokinone, soda, and sulphite, but contains only half the amount of water for a given quantity of the solid chemicals. The solution put into ordinary English measure contains proportions nearly as follows:—

Water ... ..	10 ounces
Sulphite of soda... ..	6 drachms
Hydrokinone ... ..	50 grains
Carbonate of soda in crystals ... ..	1½ ounces

Directions as to the manner of mixing are given, the principal of which is that the hydrokinone must be completely dissolved before the addition of the carbonate of soda; if any little grains are left undissolved, the addition of the alkali will cause the solution to be at first reddened, and later on rendered unserviceable.

The developing bath of these proportions Balagny considers fit only for the development of instantaneous subjects; ordinary work is developed by a mixture of new and old bath, the latter serving as a restrainer. For copying engravings, and other work of similar character, the use of an old bath, without any fresh solution, is recommended. The words new and old are used in this connection to indicate not the time during which the solution has been kept mixed, as it is stated to be but little liable to change; but to define solution that has, or has not, been previously employed for developing purposes. To extemporize an old bath for use in the first instance, 20 drops of glacial acetic acid are added to 3 ounces of the fresh solution, to which mixture a further 3 ounces of water may or may not be added. A fresh bath, without any addition of acid or of previously used solution, may be employed, Balagny tells us, for five or six instantaneous subjects in succession, after which it will still be service-

able for plates that have not received such short exposures. A great point in favour of hydrokinone, the same author states to be, the latitude of exposure which is permissible, and that without alteration of the developing solution. Plates that had been exposed for various lengths of time, varying from two to twelve seconds, all came out equally well. We remember a similar statement being made, not long since, by a member at one of the technical meetings of the Photographic Society of Great Britain. One point more mentioned by Balagny is, that the developing dish should be of glass or porcelain, the black trays so commonly used communicating a liability to discolouration and change, rendering the solution useless.

Dr. Bannow, in the *Photographische Mittheilungen*, says, that since the use of the hydrokinone developer is so rapidly extending, and supplanting particularly the use of the ferrous oxalate method, it is very desirable to dispel the supposed difficulties that have hitherto prevented many photographers from adopting the newer re-agent. It has, he says, been often stated that a solution of this substance is very unstable, often becoming discoloured even whilst filtering. Although without any doubt himself upon the subject of the keeping properties of hydrokinone solution, having kept the same from six to eight weeks without its becoming discoloured or losing its developing power, he thought it desirable to confirm his view by experiment. To this end he made up a solution on October 10th last, and tested it immediately, finding it to contain:—

Hydrokinone ... ..	1·78 per cent.
Sulphite of soda ... ..	7·26 „

Of this solution, a portion, A, was kept in a half-filled bottle in the dark room, and the remaining portion, B, in a similar half-filled bottle in a situation where it was exposed to diffused light. The two portions being tested on October 29th, nearly three weeks later, showed:—

Solution A.—Hydrokinone ... ..	1·78 per cent.
Sulphite of soda 7·00 ..	„

Solution B.—Hydrokinone ... ..	1·78 per cent.
Sulphite of soda 6·70 ..	„

Even with imperfect stoppering the percentage of hydrokinone was not diminished, and the sulphite was only decomposed to the extent of ⅓ per cent. in darkness, and ½ per cent. in the light. This experiment also clearly pointed out that any spoiling of the developer is due to change in the sulphite, and not in the hydrokinone. Some so-called sulphite of soda contains scarcely any sulphurous acid; even good commercial products containing 90 or 95 per cent. of genuine sulphite gradually becomes spoiled and useless by absorption of oxygen, and consequent conversion into sulphate, and this occurs with greater rapidity when the water of crystallization has



been lost by fusion. It is desirable to pick out decided crystals, with no large proportion of small or powder. It is also necessary that the sulphite be kept in well stopped bottles, and not in boxes or in paper.

When this characteristic of sulphite is taken into account, the mixed solution of the salt with hydrokinone may be preserved without potash or soda for several months; with soda added, it will still keep good for weeks.

Another complaint, says Dr. Bannow, that has been much expressed, is that hydrokinone development takes so long a time. With the formulæ at one time in vogue this complaint was justified, but with the more recent methods that have been put forth, development proceeds rapidly enough. He points out, however, the great effect that temperature has in regulating the time required for the completion of the action of the developer. A solution at 20° Cent. will generally accomplish its work in from two to three minutes, whilst if the temperature be allowed to fall to 15° Cent. it often requires from seven to eight minutes to achieve the same result.

We are glad to be able to record the advance in favour with which the hydrokinone developer is meeting, due no doubt in great part to improved or more convenient methods of use, and we hope that as a result of the experiments and researches recently made in connection with the use of this substance as a developing agent, there will be a higher appreciation and more general employment of it in the country to which it owes its introduction to the laboratory of the photographer.

#### MORE ABOUT THE "RIGHT" TO THE NEGATIVE.

It is not often that a customer who has merely ordered photographs or prints sets up a claim to the negative, and it may be said that it is quite an exceptional thing for a photographer who has, in the ordinary way of business, taken a portrait for a customer, to endeavour to make profit by the unauthorized sale of that customer's portrait. Last week, however, a case was before the Chancery Division of the High Court of Justice, in which application was made to restrain a photographic firm from making an unauthorized use of the portrait of a customer.

The following details we extract from the *Evening News* of last Saturday:—

The action of Pollard v. the Photographic Company came before Mr. Justice North, sitting in the Chancery Division, yesterday, in the form of a motion for an interim injunction to restrain the defendant company until the trial of the action or further order, from selling, offering for sale, or otherwise disposing of any copies of a photograph of the plaintiff, Mrs. Alice Morris Pollard, got up as a Christmas card. The plaintiff, who formerly resided at Rochester, where the defendant company carry on business, had her photograph taken by the defendant company, for which she paid £7 10s. Some time after, the plaintiff removed to Ipswich, and recently heard from her friends that the defendant company were exhibiting and selling copies of her photograph got up as a Christmas card, and having the words "A Merry Christmas and a Happy New Year" printed on it. It was contended there was an implied condition, in a contract to have a photograph taken, that the photographer would not use the negative for any other purpose than to supply the person having the photograph taken with copies. On behalf of the defendant company, it was argued that the plaintiff had no right of action, she having no property in the negative. Mr. Cozens Hardy, Q.C., appeared for the plaintiff, and Mr. Emden for the defendant company. Mr. Justice North reserved judgment.

#### CHAPTERS ON ELEMENTARY PHOTOGRAPHY— A GUIDE TO BEGINNERS.

BY W. M. ASHMAN.

##### FOURTEENTH ARTICLE.

In the last article some approximate exposures were suggested, subject to conditions clearly pointed out; but the question for what length of time it is really requisite to submit any sensitive surface to the action of the light

with a view of subsequent development, is the most difficult and perplexing part of all photography. It will have been gathered, from what has already been said, that the haloid salts of silver, suitably prepared, whether spread upon glass plates or upon paper, are acted upon more or less by every artificial light, as well as by that of the sun, and that the action is more or less marked, according to the nature of the sensitive compounds, to the colour and intensity of the light, and to the duration of that light's influence upon the surface submitted thereto. The period, then, during which such a surface is subjected to the energy of any light rays, whether coming through a lens, or through a negative, as in transparency making by contact, or, indeed, through any other partially obstructive medium, is termed the time of exposure, or briefly, *the exposure*.

As a practical illustration, in case any such be needed, let us suppose that a camera has been placed at a suitable distance from an object—say a detached house—and that a rectilinear lens is employed, by means of which an image of the building, with its surroundings of trees, &c., fill the screen, and is fairly sharp from the centre to the margins. This done satisfactorily by means of the rack motion of the camera, and by the introduction of the necessary stop in the lens, the ground glass can be turned back or removed, according to the design of the instrument, and the dark slide, provided with a sensitive plate, passed into the grooves and secured. A black cloth covering the back of the camera and the head of the photographer is essential out of doors, and a focussing eyepiece is also of great assistance. It will be clearly understood that if the rays forming the image are brought to a focus in the plane of the screen, and the film side of the dry plate is afterwards made to occupy the same plane, that the latter will receive the rays seen upon the former. When the lens aperture has been closed by a cap or any other contrivance in the form of a shutter, and when the back of the camera has been covered with the dark cloth to guard against any access of light, then the sliding shutter may be drawn to its full extent, and the cap removed, or shutter actuated, and the exposure so effected.

It is presumed that the time required for the view to be taken has been previously determined upon, and at its expiration the lens aperture is again closed, the shutter replaced, and the dark slide removed, or turned round for the purpose of using the other plate when it contains two. It is always well to take advantage of a double dark slide by making two exposures on the same object, varying the time a little, after which the slide must be put aside at once, when it should be protected from the risk of injury by light. The majority of dark slides are not so well-made as to form perfect safeguards to the plate they contain, when exposed to the full force of the sun's rays. A defective dark slide may admit an appreciable amount of light, which may afterwards become evident, either as partial fogging, general flatness, or a reversal of the image, which neither exceptional skill nor modification of development can counteract. Envelopes constructed of leather, canvas, or waterproof material are useful for slipping the dark slides into when not otherwise protected from the influence of a strong light. Some further remarks upon this subject by the writer will be found on page 372, vol. xxix. of the PHOTOGRAPHIC NEWS, 1885, under the heading of "Hints for Summer Work."

Now the question arises, how are we to ascertain what is the correct amount of exposure to give, seeing that so many conditions are to be considered. The principal factors are: First—The nature of the subject to be photographed as to colour and form—the latter with especial regard to the production of deep shadows, and the former in its relation to its chemical properties, which make it more or less energetic in impressing the plate. Second—The power of the lens in use. Third—The amount and quality of the light at the time. Fourth—The speed of the plate as shown by sensitometer test.



It is evident that the first and third of these are really most subject to change, as it would be possible to keep the others fairly uniform; but the truth is, that the experience of a few failures, intelligently considered, is by far the surest way of learning how to decide upon the relative values of the factors mentioned.

Objects having bright or very smooth surfaces reflect a great deal of light quite independently of their colour, while rough or unpolished substances absorb or diffuse a large proportion of the incident light, and so are far less effective photographically. Professor Tyndall, in his book on "Light," says:—

In all cases where the light is incident from air upon the surface of a solid or a liquid, or, more generally still, when the incidence is from a less highly refracting to a more highly-refracting medium, the reflection is partial. In this case, the most powerfully-reflecting substances either transmit or absorb a portion of the incident light. At a perpendicular incidence water reflects only 18 rays out of every 1,000; glass reflects only 25 rays, while mercury reflects 666. When the rays strike the surface obliquely the reflection is augmented. At an incidence of  $40^\circ$ , for example, water reflects 22 rays, at  $60^\circ$  it reflects 65 rays, at  $80^\circ$  333 rays; while at an incidence of  $89^\circ$ , where the light almost grazes the surface, it reflects 721 rays out of every 1,000. Thus, as the obliquity increases, the reflection from water approaches, and finally quite overtakes the reflection from mercury; but at no incidence, however great, when the incidence is from air, is the reflection from water, mercury, or any other substance total.

A red brick, or the same red in varnished paint, black satin, and black velvet, the glossy leaves of a tree in spring, and the dull greys, browns, and yellows of foliage in late summer and autumn, will illustrate the truth of this photographically. So in the case of the house with surrounding foliage the exposure would be several times more at the end of August than in the beginning of June, quite independently of the actual strength of the light. Looking at the negative of such a subject as this view, parts of it will be noticed as strongly marked, while some portions are represented nearly by bare glass. Between these extremes lie such gradations as really build up the picture and constitute in photographic language the details intervening between the highest lights and the deepest shadows. It is the chief aim of all photographic work to reproduce these details with a value approximating closely to that recognised by the human eye; and it is expressed in the general axiom long ago adopted by all photographers—"Expose for the shadows, and let the lights take care of themselves." In practice this is equivalent to always giving a full exposure, rather over than under, and leaving the production of a perfect printing negative to careful manipulation in the subsequent process of development.

Therefore, in attempting to estimate the probable exposure required to render the more shaded details soft enough to print well, the eyes must acquire the power of judging of the light value of the darkest part of the view; in fact, the only real guide to exposure is the lightness or otherwise of the image as seen on the ground glass, when all extraneous light is carefully excluded by means of the black cloth. Considerable assistance at first may be obtained by the employment of a photometer. An instrument of this kind can be constructed in a variety of ways, provided its design be to measure approximately the optical effectiveness of these same shadows.

Simonoff's photometer illustrated on page 168 of the PHOTOGRAPHIC NEWS ALMANAC for 1885 is one form, Taylor's photometer described on page 82 of last year's volume of the PHOTOGRAPHIC NEWS is another.

Decoudun's photometer is an article of commerce which can be relied upon, and the writer, having used it successfully, can therefore recommend it to those who prefer some guide other than that provided by experience, judgment, and self-reliance. By its use it is unnecessary

to calculate the extra number of seconds required, when it is desired to reduce the lens aperture with a smaller diaphragm. Such assistance, however, must always be independent of the question of colour in the object and rapidity in the plate, as it deals only with the brilliancy or otherwise of the light that goes to form the image. Luminosity of an image in the camera need not of necessity possess the qualities of a quick-acting light; on the contrary, yellow, the most luminous part of the solar spectrum, has but a moderate action upon sensitive surfaces ordinarily employed. When certain dyes, such as cyanine, eosin, turmeric, &c., are employed as in what is termed orthochromatic photography, the yellows are far more active.

With reference to the various methods of opening and closing the lens aperture in the act of making the exposure, a little must be said. There are so many shutters designed for this purpose, that nothing more than a brief classification of them according to their position and principle of action can be attempted. In selecting an apparatus of the kind, the first thing to decide is the place it will occupy. By far the larger number are arranged to go on in front of the lens; many are placed between the camera and the lens; some take the place of the diaphragm, or work by the side of it through or into the lens mount; a few are situated inside the camera front, and fewer still are worked immediately in front of and close to the dry plate. Of these positions the writer has tried all, but the simplest is undoubtedly that in front of the lens.

The mechanical principles involved in the construction of the different contrivances may be summed up briefly in the following list. The simple flap, consisting of a sort of cap of ebonite, wood, or metal, with a flat surface round it at an angle of  $5^\circ$  or  $10^\circ$  to the perpendicular, and a flap hinged at the top, and moveable by a knob at the side. Both the flap and flat portions are better able to exclude light if covered with black velvet. This is useless for quick work; but for views it has the advantage of exposing the lower and darker parts of the view more than the upper and lighter to any extent.

The simple slide, consisting of a strip of wood or metal, &c., with a hole in the centre, the size of the aperture of the lens. There is a catch to hold it in position, a trigger to release it, and a spring (if gravity is insufficient) to make it pass rapidly down, or up, as convenient. This is usually made to work in simple wooden,

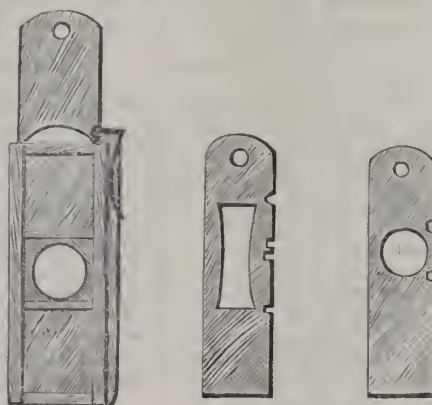


Fig. 19.

ebonite, or metal grooves in front of the lens as shown in fig. 19, or carried through the lens tube by the diaphragm slot.

Then there is the double slide, where two strips of metal or wood pierced with holes pass each other in opposite directions at the same rate in front of the opening. This means greater rapidity, but not more even illumination. Instead of strips or slides many have



discs with a hole therein; single discs to rotate before the opening, or double discs to revolve past each other in the same way as the slides. Then there is the go-and-return form of shutter, in which a piece of metal is drawn up from the opening and returns to it, or two pieces, one passing away, and the other falling to close it. This is the favourite shutter for attaching to lens mount to work by the side of the stop; but the illumination is very unequal, and so is useful for giving shorter time to the sky.

Then there is the combination of a flap and slide, the former opening and the latter closing the lens. Many complain of the jar given with this type of cap, when the camera and stand are light.

Another, very often found at the back of the lens or in the middle of the tube, is formed of a strip of leather hanging over a wire roller, and perforated with a long slit, or two round or diamond-shaped holes. By pulling one end of the strip down the exposure is made, and it is then ready for a second exposure by pulling the other end, and so on. The slit allows for unequal lighting when necessary, and the holes for rapid work coming under the category of instantaneous photography. An adjustable spring may be employed to pull the strip.

There is also great variety in the methods of actuating the slides, discs, flaps, &c., from the elaborate clockwork of some to the simple india-rubber band of the majority; and the appliances for regulating the speed are equally numerous, but the alteration of a coiled or straight spring, and the manipulation of a plain rubber band, are those chiefly used. Much depends upon the purpose for which the shutter is required, and concerning the choice of contrivance we will speak in the next article.

### FRENCH CORRESPONDENCE.

**PROJECTED PHOTOGRAPHIC CONGRESS—PIZZIGHELLI'S NEW PLATINOTYPE PROCESS—UNIVERSAL EXHIBITION—PHOTOGRAPHIC INSTRUCTION—STEREOSCOPIC PHOTOGRAPHY—PHOTOGRAPHIC PUBLICATIONS.**

*Projected Photographic Congress.*—We do not know whether the project relating to the creation of a Photographic Congress, in connection with the great Exhibition of next year, stands any chance of accomplishment. The Belgian Photographic Society made a similar endeavour some years since without success; the representatives of the greater number of the countries invited to take part in it having failed the promoters of this useful, if not indispensable work. The idea has been taken up again by the French Photographic Society, and the occasion appears to be well chosen; nevertheless, we do not dare to predict for this new effort a much more decisive result. It is not an easy thing to persuade diverse nations to sink each its own method, and adopt some particular one. Those in use include several systems long since adopted, and familiar to the constructors of apparatus and to the learned of different countries. We know, for instance, what difficulties the decimal system has to encounter in England; even now there are but few who are beginning to make use of it, and it will require a long time before it will be adopted by the greater number. Besides, we do not know exactly what are the questions to be treated by this Congress; doubtless it will tend to reduce several measures to one or more units. There will be an understanding to be arrived at on some points relating to the standard of light; to the standard of screw-threads in use with lenses; upon the commercial dimensions for sensitive plates; and upon a uniform designation of various processes. For example, the name "phototypy," which in France means a process for obtaining impressions in fatty ink, is elsewhere bestowed upon processes of which typography forms the base. This process has many other names, such as collotype, glyptography, gelatinography, &c. A preparatory committee has been formed to elaborate a programme; it contains

such eminent names as those of Janssen, Wolf, Marey, Peligot, Becquerel, the Brothers Henri, in addition to a certain number of distinguished amateurs whose names are well known in the photographic world. We regret that the number of professional photographers included in this committee should be so limited; there are in all only two, out of forty members. It appears to us that the practical questions to be resolved are of more capital importance than the theoretical questions. We may indeed ask ourselves what is the utility for practical photography of a rigorously scientific standard of light? Such questions relate rather to pure science than to the artistic and industrial applications of photography. However, the Congress will probably assemble, and whatever its work may be, something useful will surely result from the meeting of a large number of *savants*, of professional practitioners, and of distinguished amateurs devoted to the progress of the attractive and marvellous art which engages us. We shall take care to keep the readers of the PHOTOGRAPHIC NEWS informed of the labours of this Congress.

*Pizzighelli's New Platinotype Process.*—This process, which gives results like those which form the subject of Willh's patent, is as yet but very little practised, in spite of the advantages which it presents over the older method; but there is every reason to hope that this method of printing, giving directly images of an assured stability, will ultimately bear the sway, as soon as some new improvements have been introduced into the preparation of the new paper. Among the improvements to be sought for there is, in the first place, one relating to the fineness of the print—in other words, to a more complete absence of rugosity in the paper, so that it may be employed for the printing of small prints full of detail. Then it is important to find greater sensitiveness; the time of exposure is truly too long, and in these days of feeble light it requires too long a time before the negative is done with, especially if that happen to be rather a dense one. Nevertheless, the use of this paper is good in a host of cases, where the rugosity is of no consequence. The path opened by Captain Pizzighelli is most happy, for it insures a diffusion of the process of platinum printing within a space of time which appears to us not likely to be an extended one.

*Universal Exhibition.*—Whatever may be said, the great Universal Exhibition will take place. Nothing less than the occurrence of a war, of which there is but little probability, can prevent its opening. Meanwhile preparations are actively carried on, and everything leads to the belief that all will be ready in good time. The Class XII., which is that of photography, is being thoroughly organised. Already works of installation have been decided on to the extent of 72,000 francs, and this relates only to the fitting up of the hall; each exhibitor will have to be at the expense of his own installation. We are speaking now only of the French section, but there will be, in addition, the space awarded to foreigners, which occupies about half the surface allotted to France.

*Photographic Instruction.*—The utility of regular photographic instruction is more and more felt. Two courses of instruction in practical photography have been commenced almost simultaneously in France—the one at the Polytechnic Society in Paris, where M. Gravier, one of our pupils, has been chosen as professor; the other at Nantes, in conjunction with the Polytechnic Society of that place. The professor in the latter case is the well-known photographer M. Etienne Pinard. We have yet to see created, with the aid of the State, a course of regular instruction of this kind, either in the department of the Faculty of Science, or in the principal schools of Fine Art. Without doubt, this desideratum will not long remain unfulfilled, in the presence of so many private efforts tending to the same end.

*Stereoscopic Photography.*—There are indications that this very interesting branch of photography is in the way



of finding the favour that it formerly enjoyed. We see the manufacturers of apparatus applying themselves afresh to the construction of cameras better adapted this time to the exigences of photography. Unfortunately, the great difficulties attending on printing upon glass in lieu of paper are the cause of the neglect which stereoscopic work has suffered. Certainly, one may content one's self with pictures printed on albumen paper, but stereoscopic views present a much greater attraction when printed on glass; they are much better when seen as transparencies, and, particularly, are more conveniently inspected with the apparatus known as the American stereoscope. When printing directly upon sensitised glass, it is necessary in the first place to cut the stereoscopic negative, and transpose the halves; this constitutes a tedious and risky operation. We run, in fact, the danger of breaking the negative, and glass cutting is not an accomplishment possessed by every amateur. We therefore counsel those interested in this method of printing to make use of one of the well-known methods of transfer, such as the transferotype paper of the Eastman Company, or of gummed paper sensitised with collodio-chloride of silver emulsion. In the latter case, the image is produced visibly under the action of the light, and the transposition of the two prints only takes place at the moment of transference to the glass plate; we have only to apply one stroke of the scissors to the paper, a much less difficult task, truly, than cutting a glass plate. We do not hesitate to give preference to the method with gummed paper and collodion emulsion, because one can see better what one is doing, and also because the operation is one of the most simple and easy. There is nothing to do but to coat the glass with a very thin film of gelatine, a solution containing ten per cent. of gelatine in relation to the water. The plate is dried, and it is moistened at the moment of transfer. The prints, previously cut to the proper dimensions, are applied side by side in the dry state to the place which they should occupy on the film, and a squeegee passed over them; in a few seconds the moisture from the gelatine, penetrating the film, softens the gum, and the paper readily abandons the image upon the smallest effort to detach it. The operations of fixing, and of toning if there is any, are only effected after the transfer to the gelatinised plate. Collodion is found in commerce ready emulsified. It is prepared of very good quality by the house of Blain Brothers, Valence, Drôme, who supply it in two solutions which are mixed only just before coating the paper. Nothing is easier than to spread the collodion emulsion upon the gummed surface. This mode of printing possesses the advantage of yielding images of greater delicacy than that possessed by images on gelatino-chloride of silver, and further, as we have just observed, the details of manipulation present no serious difficulties. In a very short space of time an operator, however little accustomed to it, becomes absolutely sure of his work in the employment of this process.

*Photographic Publications.*—The publishing house of Gauthier-Villars has just issued a series of new photographic publications, amongst which, we think ourselves justified in recommending "Hydrochinone," by M. Balagny, which contains a *résumé* of his formulæ, and of all that he has written on the subject of this excellent developing agent; *L'Art de Retoucher les Négatifs*, by M. Klary; *Traité Pratique de Photo-miniature*, by M. A. Simons; the third edition of the *Traité Pratique de Photo-lithographie*, by Geymet; *Procédés de Reproduction des Dessins par la Lumière*, by R. Colson; *Traité d'Impression Photographique aux Encres Grasses et de Photographie et de Photogravure*, by Mook, edition entirely recast by Geymet. M. Bernard Tignol has just edited the *Guide du Photographe et de l'Amateur Photographe*, by Fabre-Domergue. There are in this series of works many interesting pieces of information; one cannot consult them without deriving profit.

LEON VIDAL.

## FLASH LIGHTING.

BY ROBERT OFFORD.

IT has no doubt occurred to several photographers that a great many doubtful advantages have been claimed for the application of magnesium powder, simple or compound, to photography. Perhaps the truth is that no one of very considerable experience, experimentally or commercially, would deliberately go out of their way to take a portrait by a flash of artificial light, however strong. It is the nearest equivalent to a drop shutter exposure out of doors in fine weather, with a slight advantage in favour of the latter. No one will deny that there is a distinct characteristic about a negative taken very quickly, as there is about a print from an average negative printed in sunlight. True there are subjects that demand the employment of the most rapid process that it is in our power to use; and there are negatives from which nothing short of sunshine will produce a decent print. But these are the exceptions, and for the sake of the occasional necessity which may arise, it is well for nearly all photographers to have some sort of contrivance ready to hand, and to be prepared to make the best of the negatives produced with it. Portraiture is not the field in which it is most likely to be found useful, as even home pictures of invalids, aged persons, fancy and dress costumes, &c., can generally be managed in an ordinary apartment by daylight—certainly, with the assistance of a little magnesium ribbon, in the case of a group, where part of the subject is further from the light than the rest.

But it is rather in photographing the apartment itself, or curiosities in the way of furniture or decoration, which are certain to be placed in an indifferent and unsuitable light. Some subjects one has sometimes to take are really in approximate darkness, and many architectural eccentricities can only be photographed by artificial light.

There is one striking advantage in the flash light over the old plan of burning magnesium ribbon—namely, the wonderfully increased area of the light itself. In the one it is almost a point from which the illumination emanates, while in the other the incandescent magnesia forms almost a cloud, and the larger that cloud is, the less necessity will be found for any diffusing media.

I put out of the question two or more lights, because there are always two or more high lights in the eyes, and the effect upon the face is that of unnatural gradations of tone. Therefore, any apparatus for burning the powder will be, *ceteris paribus*, more or less perfect compared to others, according to the flash produced.

The first point to be considered is portability. Gas is all very well in a studio, but who will care to carry long lengths of tubing, on the chance of their being needed, to attach the apparatus to a distant bracket or gaselier? No doubt the long flame from a Bunsen burner, with good pressure from main, presents all the best conditions for a large and brilliant flash, but it is not always possible to arrange it, so one must fall back on methylated spirit and make the best of it. The question next arises—which is the best direction for the flash to take, the horizontal or the vertical? Each has advantages worth consideration, and perhaps it is well to be provided with both, so as to meet any case. Then the shape of the flame, or burner, and of the opening through which the powder is forced, require a little thought, as does also the pneumatic compressor for producing the necessary power. And lastly, the powder itself may be modified somewhat, to great advantage.

After a good many experiments the following arrangements commended themselves by their simplicity, portability, and effectiveness. To begin with the powder, two precautions seemed to be very desirable, one suggestive of the old motto "Keep your powder dry," and not only the powder, but the tubes through which it passes. One sample I obtained was decidedly damp, and stuck to the sides of the container that held it. The other precaution



is to avoid using very coarsely-grained magnesium, such as is often to be met with in the commercial article, as much of it is apt to go through the flame unburnt. The separation of the finer from the coarser particles is not a very easy matter, for it cannot be washed like emery and other powders, and divided by taking advantage of the variation in the specific gravity in water, but it can be managed in a mixture of water and methylated spirit. This, however, is not so effective as screening it through muslin, which is accomplished most easily by putting the powder in a muslin bag, secured to the cork or stopper of a wide-mouthed bottle. The very fine particles are thus prevented from being lost, as they can be shaken to the bottom of the bottle, but it requires some prolonged agitation to make it pass through the fabric.

The lamp itself consists of a shallow trough, oval in plan, about half an inch wide and deep. The centre is one inch and a quarter long, and half an inch wide, and the whole is easily made of tin plate by any one who can cut it up and use a pair of pliers and a soldering iron. This shape is preferred, as allowing the powder to be spread out in one direction, and so to produce a broad flash. The container is simply a U tube of glass, about five-sixteenths of an inch inside in diameter, one leg being half the length of the other, and shaped at the extremity in a gas-flame into the form of a long narrow slit, as narrow as it is possible to get it, and about three-quarters of an inch long. This could be made of brass, but the glass is preferable, because the smooth surface offers so little friction to the passage of the powder. The other leg is not straight or vertical, but bent at an angle of  $45^\circ$  to keep it out of the way of the flame, and yet allow of the powder being poured into it.

If this tube is fixed to a small block of wood, the lamp can be attached to the same by means of metal feet, in such a position that the long opening in the short end of the tube is just below the opening in the trough, and quite central. Some contrivance is necessary to enable one quickly to attach or remove the rubber tubing; a perforated cork is very well if nothing better is to hand, and the trough is packed with asbestos or sponge. The great thing is to have plenty of spirit, and therefore a long flame. There is one important disadvantage in the use of the ordinary rubber ball, as used for shutters; for when the charge is fired, and the pressure relaxed, the flame is sucked back into the tube and damped by condensation, which interferes with the next shot. I prefer the simple apparatus employed for producing spray, consisting of two small balls, one to press, and the other to act as a reservoir. If a spring-clip is secured to the tube between the second ball and the lamp, the pressure can be regulated to a nicety by varying the amount of air pumped into the reservoir; two impulses generally prove to be sufficient with a short tube and moderate charge. To fire the charge it is only necessary to press the spring-clip, when the reservoir empties itself instantaneously. I have found that this is almost too violent for perfect combustion, so I partly close the tube somewhere by a small piece of cork or an adjusting screw, when the discharge is dragged a little. It is really astonishing how few grains of powder will suffice for a portrait, say an inch and a half head, with a portrait lens stopped to  $f$ , and the lamp within five feet of the sitter. The flame being very large, there is plenty of diffusion with a white reflector on the shadow side.

In employing artificial light for rooms, a source of annoyance is found in the pictures which decorate the walls; the glass of one or more is certain to give a reflection of the image of the flame on the plate, but by making some of them lean forward at the top more than usual, the light is thrown upon the floor, and does no harm.

By placing a good lamp where the flash will come, and moving it about a little, the reflecting surfaces that may prove annoying can be detected and adjusted. Large

mirrors are often impossible to correct, and in those cases day-light must be employed.

In printing from flash-light pictures showing somewhat under-exposure or too great contrasts, an old suggestion of wet plate days is rather valuable, and that is to bleach the negative with mercury and stop at that, as the white deposit is more easily printed through. They are rarely white after a good washing, as ordinary water contains enough lime to render them more or less grey.

## THE RIGHT TO THE NEGATIVE.

BY W. E. DEENHAM.

A RECENT decision by a County Court Judge, awarding the negatives taken of a building to the customer, has naturally exercised the minds of photographers considerably, and been the cause of no little uneasiness and alarm. Photographers have all along supposed that the negative, in the absence of any stipulation to the contrary, is the property of the producer, and if it is really a fact that according to law they have throughout been hugging a delusion, the sooner they are authoritatively made acquainted with their true position the better. In such a case they can consider whether their interest will be better served by requiring special contracts with their customers, by agitation for a change in the law itself, or by a revision of prices such as to fairly satisfy them for parting with the negative after executing the smallest order for prints therefrom.

It seems, however, to be at the least very doubtful whether there is any such authoritative exposition of the law on the point as to decide the case against photographers generally. In the first place, there appears to be a considerable divergence of opinion as to what point the ruling of the judge in the present case depended upon. This diversity of opinion may depend upon difference in the reports as they appeared in different papers. A striking difference in these reports, although one not materially affecting the point in question, is that according to one newspaper, the defendant had paid a certain sum into court, whilst according to another paper, the Judge said that he ought to have done so. However, I have heard it argued that the question was not one involving a doubtful point of law, but of fact; that according to the defendant's version he had, in arranging the price, used words bargaining to have the negative, whilst the plaintiff did not consider this to have been the case, and the Judge, on the whole, credited the defendant's statement. From the reports published in the PHOTOGRAPHIC NEWS, and taken from the *Kent Examiner*, this view does not appear to me to represent the case. According to this version, the Judge decided that the "defendant was entitled to the negatives by law, and that no contract had been entered into that would take away that right." This may be taken to be a specific intimation that in that Judge's opinion, the negative, in the absence of a specific contract, belongs to the customer, and not to the photographer.

Whether, in the present instance, there was any right of appeal to a superior court, has not been stated. If such right exist and is not exercised, it is greatly to be regretted, although it would probably be too much to expect a photographer who has undergone the cost and anxiety of one set of legal proceedings, to undertake another and much more costly process, in which, if he succeeds, he is still likely to be out of pocket. It may be well, however, to consider, so far as we can, to what extent the probabilities tend, as to the ultimate result. It would be out of place for one not in the legal profession to offer any positive opinion, but the basis of law is, after all, in the main, common sense, and although there are deviations from this basis, yet I have sometimes observed that one who takes this for his guide has, in the event, proved right, although the more learned, relying upon some



technicality, had taken an opposite view; the technicality relied upon being overruled by some other technicality, or by some broad general principle.

It appears that the question in dispute is one of contract. What is it that the customer and photographer contract for when a sitting is taken, and an order given in the usual way? The ultimate possession of the negative is not mentioned, and not being mentioned, what is the understanding in the minds of the two parties? It seems hardly open to question that the understanding is that the usual course will be followed. What is the usual course? That the negative remains in the possession of the photographer.

We must all have observed a legal principle which recognises that in matters not specifically mentioned, the "custom of the trade" is taken as deciding an unsettled point. This recognition of the custom of the trade, although sometimes it may seem to strain justice to the injury of the customer, is, in the main, founded on common sense. When a contract or bargain has been made in which it is found that some point has not been specified, what can reasonably be inferred but that the course which is customary is that which was intended?

The custom of the trade in regard to the negative being the property of the photographer should, one would think, be sufficiently firmly established. In the days when glass of a more expensive quality was used, and the photographer prepared his own sensitive film with collodion, there were many who periodically cleaned off their negatives, after a certain lapse of time, and used the glass again. This they would clearly have had no right to do if the negative belonged to the sitter. In selling a business, too, the stock of negatives is often the most valuable item in the property; but if they don't belong to the photographer, he has no right to sell them. What would be his position if, after disposing of his negatives, customers were to demand from him the plates? The law seems to have recognized the right of photographers to the negatives, by the proceedings of the Bankruptcy Court, which orders the sale of the property of an insolvent photographer, including the negatives. If these do not belong to him, but to the sitters, what right could the Court have to dispose of them?

Another consideration, indicating the justice of the claim of the photographer to the possession of the negative, is the fact that his prices have been arranged with this understanding. Whether or not it would be desirable to charge a higher price than is now done for the first copy, or set of copies ordered, and proportionally less for duplicates, is a question that need not be argued. The fact remains that first orders (which include taking, but not parting with, the negative) are not generally charged at prices that make them yield proportionately so much profit as orders for duplicates. There is, too, with the present understanding, the stimulus to do one's best, hoping for reward in the number of copies that may be ordered.

The number of cases in which a customer requires a negative may be very rare, but probably most photographers of long experience will have had cases wherein the sitter has stated that he wishes not merely for the prints, but for the negative, and has arranged for an extra payment accordingly, in the first instance. When enlargements have been ordered from one photographer, from a portrait which has been taken by another, it has been the practice of some to send to the photographer who took the original negative, and, by payment of a certain sum, arrange with him for the transfer or use of the plate.

If all these facts do not suffice to make a "custom of trade" enough to decide a point in the contract not specifically defined, it is hard to see when such a custom can be established at all.

The right to the possession of the negative ought not to imply any right to the use of the negative, otherwise than by permission or desire of the sitter. There is obviously no justice in such a demand, and, so far as I

have observed, it is very few who would put forth such a claim. The mere fact of having taken a photograph in the ordinary way of business (I am, of course, not now speaking of persons who have sat without payment expressly for publication) can give no right to the use of such photograph to the annoyance of the sitter. A case comes to mind strongly illustrating this position. A lady, whose husband had died under suspicious circumstances, had sat some time previously to a photographer. The widow having become a subject of notoriety in consequence of the inquest which was being held, the photographer took advantage of the circumstance to flood the shop window with portraits of the lady. The finding of the coroner's jury did not inculcate her, but she found herself recognised, and an object of remark wherever she went. She secluded herself, took to drinking, and died soon afterwards. The foregoing is, perhaps, an extreme case: whether the photographer infringed the law by his conduct I am not prepared to say, but if there is no protection to the customer from such a course of proceeding, I believe the body of photographers have too much respect for fair dealing to object to such protection being given, and if any legislation should be found necessary, and it is practicable to obtain it, the recognition of the justice of the photographer's claim to the negative should not be endangered by any pretensions to use of the negative not compatible with fair dealing to the customer.

#### MISCONCEPTIONS CONCERNING ORTHOCHROMATIC PHOTOGRAPHY.

BY W. BEDFORD.\*

DR. H. W. VOGEL has recently stated that "whilst in Germany colour-sensitive processes have been introduced into practice for five years, it seems that in England the matter still interests only from a theoretical point of view." Now, so far, at any rate, as landscape work is concerned, this statement can hardly be denied, and, were it not for the important collection of landscapes illustrating the comparative results from ordinary and eoside of silver plates shown at the late exhibition by Dr. Vogel himself, it might, perhaps, still be thought by some to be an open question whether anything is to be gained by the use of colour-sensitive plates for landscape work. I think if any reliance is to be placed at all on these photographs—and I see no reason whatever to distrust them—they will effectually dispose of the objection, which I call Misconception No. 1, that colour-sensitive plates are of little or no value for landscape work, an inference drawn from the surmise that the colours reflected by natural objects would have no actinic value.

Another misconception frequently put forward is to the effect that by using a coloured screen with ordinary plates the same advantage may be secured as by using orthochromatic plates. This is true only to a very limited extent. You will see by these examples that an ordinary plate exposed through a yellow medium gives very much the same effect as an erythrosin plate exposed to white light, but that when the yellow medium is used with the latter the extra colour sensitiveness inherent to it is of enormous practical advantage. The only useful effect of a screen is to cut off those coloured rays which otherwise would be too vividly rendered. No screen or coloured light can impart colour sensitiveness which must exist in the plate. Closely allied to this is the misconception that it is a practical orthochromatic method to make use of ordinary plates coated with dyes dissolved in collodion or varnish. This process was gravely advocated within the past few months by a leading photographic journal, and it has been allowed to pass without question. The advice was founded on a laboratory experiment of Captain Abney, who, I should think, would be the first to disown such a method.

I am afraid it is also a misconception to imagine that any so-called orthochromatic plate will give even approximately correct rendering of all colours by daylight. All that can be urged at present is, that such plates are sensitive to colours; but, in order to represent these colours in their true intensity, it is necessary to use either coloured light, or such a medium as will have the effect of reducing the actinic value of those colours which it is necessary to subdue. Here are two prints from erythrosin emul-

\* Paper read before the Camera Club.



sion negatives, one exposed with, the other without, a yellow glass. You will note how differently the blue sky, the deep blue lake, and the green hedge and bank are rendered in the two cases.

Erythrosin plates are very suitable for landscapes, but when red has to be represented they entirely fail. Several substances have been successfully employed to give red sensitiveness. Here, for instance, are examples from plates coated with emulsion prepared with minute proportions of cyanine and methyl violet. You will observe that cyanine gives the red in this colour-chart lighter than the blue, but not until the actinism of the blue has been sufficiently absorbed by a yellow medium.

When we come to the preparation of colour-sensitive emulsions—and it is to these rather than to both processes that I have given most attention—the first difficulty is to obtain a suitable colour sensitizer. I have experimented principally with various commercial eosins, including erythrosin, also with cyanine and methyl violet. The three last named substances combine with silver in the presence of excess of soluble bromide, and the dye is not removed in the subsequent washing to which the emulsion is submitted. This fact seems to point to a true chemical combination, which appears to be essential to the production of colour sensitiveness; moreover, with some samples of eosin which do not combine with silver, there is an entire absence of colour sensitiveness.

There is some misconception I would wish to point out in connection with the preparation of eosin emulsions. It has been insisted on as essential that ammonia or some other alkali should be used along with eosin, but this, I find, is by no means necessary. In fact, those who, like myself, prefer the boiling method, will be glad to do without ammonia, and I am convinced that colour sensitiveness is in no way impaired by the omission. I have elsewhere described how an erythrosin emulsion may be made, so I need not now repeat the formula.

Finally, I would wish to guard against what would be a most fatal misconception, namely, that we have already arrived at perfection in orthochromatic processes. This desirable consummation will only have been attained when, dispensing with coloured screens, we have at our disposal permanent plates, not merely giving a true translation of all gradations of colour, but also of such rapidity as to render instantaneous photography practicable. If Englishmen can do anything to assist towards this end, they will do more than remove the reproach which Dr. Vogel now, with justice, brings against us.

### Notes.

The adjustment of the clock-work magnesium ribbon lamp, where the speed is determined by the angle at which the fans are set, is difficult and seldom quite satisfactory; and for short exposures, we think most who occasionally require a magnesium lamp will prefer to use a simple and inexpensive lamp of a kind which we have just received from Perken, Son, and Rayment. The body of the lamp is



a trifle larger than a full-sized watch, and the concave mirror shown on the west side of the cut, and behind the tube delivering the ribbon, swings round on a pin so as to centre with the body of the lamp when out of use. The delivery of the ribbon is controlled by a milled disc, about one-third of which is shown projecting at the top of the body of the lamp; the upper edge of this disc being drawn forward by the forefinger of the hand holding the lamp.

In using a magnesium lamp, it is well to wear a pair of dark glass spectacles, the best kind being a sort with cup-shaped glasses that fit pretty closely to the orbits.

"Electric Bells, and all about them," is the title of a new book by S. R. Bottone, and published by Whittaker, of Paternoster Square. Mr. Bottone is one whose work is well known to photographers, and in it one finds a number of bell signal arrangements likely to be of service in a photographic establishment, not only for the oft-needed signals between department and department, but to give warning of such events as unwelcome entries into dark-rooms. The directions for fitting and arranging are so clear that we imagine anyone having sufficient of the instincts of the workman to be a photographer, will have no difficulty in profiting by the instructions.

Up to the present, photographers have rather worked on the pictorial side, and the possibilities of photography as a means of decoration are by no means so developed as might reasonably have been expected. Next week we hope to publish a lecture on "Design," delivered last week by Walter Crane before the Arts and Crafts Society, and this may, if rightly read and well understood, serve as an aid to those who, not neglecting the pictorial side, may wish to develop the decorative aspect of photography.

"Captain Coe, of the *Star*," writes a correspondent, "is a sanguine man. Desiring to give, in his particular column, portraits of sporting celebrities, he asks gentlemen to send in their photographs. Capt. Coe may like to know what my experience has been in this sort of thing. I have for some time past been connected with a paper which makes portraits a speciality, and I honestly say that if there is one thing more difficult than another to procure, it is a man's photograph. In nine cases out of ten he is very coy over the matter, pretends he hasn't got one, or, if he has, it was taken fifteen years ago, and 'is not a bit like me now, you know.' A favourite excuse is that there is only one photograph, and that is in the album of the man's wife, and that on no account will she take it out. When you are fortunate enough to get the promise of a photograph, the chances are two to one that the promiser forgets all about it; and when you rush down in agony to his office at the last moment, you find that the photograph is a long way off at the man's country house. The public, too, have the vaguest notion of time. Thus, supposing you must have the photograph on Thursday night at the latest, they think nothing of sending it about two o'clock on Friday, when it is quite impossible to reproduce it. The difficulty of obtaining a portrait is one of the nuisances of modern journalism."

As bearing on this, we may say that the artist of the *Financial World* was reduced the other day to a curious expedient to obtain the picture of a man he wanted. He was not permitted to be at a meeting of directors of the company—that of the Hop Bitters, Limited—having their own reasons for excluding the press; but he secured a portrait of the chairman nevertheless.

One side of the room had windows instead of panels, in order to give light to a corridor. These windows were frosted; but on one of them the frosting pigment had been



scraped away, leaving a hole about half an inch square. This hole commanded an excellent view of the chairman, and through it the artist looked and obtained a first-rate portrait.

It would be interesting to know how long those who may be termed our best portrait photographers spend over each sitter. It is by no means certain that those who give the most time get the best results. Mr. Herkomer lately said that Mr. Gladstone told him that on each of the three several occasions on which his portrait had been painted by Sir John Millais, the latter only spent five hours over the entire work. Yet these portraits, Professor Herkomer considers, the finest things, in their way, that the painter has ever done. We fancy the experience of most photographers is that if a good expression be not obtained during the first three trials, the chances are that the expression will not improve. But as one would say of rapid painting that it all depends who is the painter, so in the case of a happy expression in photography, it all depends upon the photographer. A capacity to put people at their ease outweighs mechanical skill or even artistic feeling.

Professor Roger Smith, who delivered a lecture entitled "Mistakes in Architecture" a little time ago at the University College, has not a very high opinion of photography as an adjunct to the study of architecture. He thinks that photographs—whether you buy them, or, what is worse (because it takes so much time up), make them—are almost worthless as substitutes for the results of your own sketching and meaning. What you draw, he says, you look at, you to some extent understand, and you will generally remember; while the drawing will always remind you of what you saw, and tried to fix on your paper. This is all very well, but we are afraid that Professor Smith knows little or nothing about photography, or he would not raise the objection that it takes up so much time. We also fail to see the advantage of an unfinished drawing which reminds you of what you could not draw. The professor should take a few lessons in photography, and then give his opinion.

The evening papers have a curious knack of cherishing pet topics which they drag out as perfectly fresh at intervals of about six months or so. One favourite subject is the alleged experiment of an Italian doctor—whose name and address are never given, by the way—as to the effect of certain colours upon persons suffering from mental disorders. The *Evening Standard* resuscitates this fossil this week, and goes through the old tale of how a man afflicted with melancholia was at once made lively by being placed in a room coloured red, and how another suffering from acute mania was subdued when confined in an apartment where everything was blue.

The *Standard* may like to know that we have observed the same thing ourselves. We have seen a grave, sedate, and even sad man rendered almost mad when in the recesses of his dark room—which it is scarcely necessary to

remark is illuminated by a ruby light—we have seen him dash a negative down in a paroxysm of passion, and utter language which, as a rule, would not issue from his lips. It may be mentioned, merely as a detail, that the sitter was a fractious baby, but we do not think this had anything to do with the phenomenon, which we attribute wholly to the effect of the red light. On the other hand, we have noticed irritable persons assume the most angry air when they have sat down in the posing chair in a photographer's studio, which is usually coloured light blue. These interesting facts are quite at the disposal of our contemporary.

## A CHAPTER FOR AMATEURS.

BY C. BRANGWIN BARNES.

Most professional photographers, in the course of their experience, discover or drop across various small aids or helps to this or that branch of the art. Many great things have, ere now, turned on trifles, and the object of this short paper will be to make known to the searcher after light in the amateur ranks of the "Art Science" some few trifles, which, small though they may seem to be so far as their importance in relation to the actual production of the photograph is concerned, may yet prove of great use to those who are compelled perforce to work under difficulties; whose studio is mostly the open air or the drawing room, and whose dark room has to be manufactured for the occasion.

Trifle the first. I have found that the orange paper used for packing plates, and which is mostly torn and thrown away when the box is opened, is very useful if saved. The pieces of this paper, if gummed or pasted together, come in very handy to cover over one side of a conservatory when in use as a studio; also to block the window or windows of any room that is being used temporarily as a changing or developing apartment, though of course new sheets of the same kind of paper may be used if preferred, the only difference being that the half-sheets used for packing whole plates come considerably cheaper, and, being smaller in size, block more light, owing to there being a greater number of joins.

Trifle the second. A good impromptu sink for developing in an ordinary room, and which can be carried with the other apparatus, consists of an ebonite dish 12 by 10, or larger; this will effectually catch any splashings or overflow of developer, and possibly save a blowing-up for spoiling a table-cover or staining a table. The best lamp for dark-room work is one which is sold, I believe, by most dealers, and much resembles an ordinary paraffin lamp, the only difference being that the chimney is of ruby glass, and has a top to it to prevent the escape of white light; it gives a brilliant ruby light, which is at the same time perfectly safe for use with even the most rapid plates. I would never recommend an amateur to develop with anything but artificial light, unless he has a properly constructed dark room. No one knows the difficulty of improvising a dark room, or rather developing room, but those who have tried. Amateurs spoil more plates by fogging than from any other cause, therefore I would recommend that they always develop at night with a ruby lantern.

Imperfect washing, both of the negative and of the print, is a frequent source of failure, as many amateurs imagine that a few minutes' rinse under the tap is quite sufficient for the plate, and are often puzzled as to the cause of the stains which appear on the paper when printing, and of the damp and semi-greasy appearance and feel of the surface of the plate. Insufficient washing is the cause of this, and what is more, it must inevitably ruin the negative, as the soda left in con-



tinues its work for weeks and months, gradually eating away the whole of the image, and leaving a plate covered with white crystals in place of what was once a bright little negative. Over and over again amateurs have brought me their plates in this state to ask the reason of the failure. An hour's washing in running water is the least that can be given to ensure permanence of the cliché, and double or treble this will do no harm. It is easy to tell when a negative is properly fixed, but it is much more difficult to judge the same with regard to a print; imperfect fixing inevitably means fading, and that at a very early date, whereas over-fixing has no such result. In point of fact, a print has to be very much over-fixed indeed to show any difference between it and one that has been timed to the second. Moral—Be sure not to under-fix your prints if you wish them to stand; and when you are sure the hypo has thoroughly done its work, make sure the water does the same. Do not be content with an hour's washing now, but wherever it is possible, give your prints all night in running water, after at least a dozen rapid changes—and in the morning give at least a dozen more. For mounting, use freshly-made starch or gelatine. Avoid such preparations as are sold ready-made by stationers, and which mostly contain an acid which, though it may preserve the mountant, will have the very reverse effect upon the photograph.

The vignette style of printing is of great utility to amateurs as well as to professionals, as bad or defective backgrounds, which are very common in amateur productions, can, by its aid, be obliterated. The best mode of vignetting such negatives is by the use of the commercial vignetting glasses; if used singly they are rarely found to be sufficiently opaque at the edges, and I would therefore recommend that, after adjusting the one best suited to the subject or to the outside of the pressure-frame, another, with a trifle larger aperture, should be placed over it, which will give a better result. Vignetting papers may be used in the same way, but the process of printing will be much slower than where the glasses are used; an alternative method, which may in some instances prove the best, is to cut a cardboard mask: this is especially useful where the ordinary pear-shaped opening will not block out any objectionable portion of the background or figure. To ensure softness of gradation, tissue paper may be gummed over the aperture.

I would strongly advise all photographers, whether amateur or professional, to never omit the process of varnishing the negative, and that before a single print has been taken from it. Damp paper, or a damp atmosphere, will draw the silver into the gelatine film, and irretrievably ruin the plate; and no one knows how valuable that special plate may afterwards become, though apparently of very little value at the time. Whenever a negative has been intensified it should be thoroughly washed, or it is sure to become worthless in a very short space of time.

In exposing, it behoves one to be careful as to the sequence in which the plates are exposed; even where a note-book is in constant use, it sometimes happens that a plate is exposed on two different subjects merely through the operator exposing his plates out of order. As the slides are numbered, so should their contents be exposed, commencing with number one, and so on; not number five first because that slide was the first to come to hand. It is no more trouble to do the thing correctly, and there cannot be anything like the danger of making double exposures.

#### TONING.

BY H. M. ELDER.

ONE of the most important operations the ordinary silver print undergoes is that of toning, i.e., the production of an agreeable tint on the finished print, instead of leaving it to come out what colour it will. No doubt photography would never have

gained the popularity it has, had it been impossible to alter the offensive red of an untuned silver print. It seems equally desirable that a method should be found by which the tone of a bromide print should be brought under control. Since bromide printing first became popular, it seems that very few, if any, attempts have been made to modify the cold blacks and greys produced in the direction of rendering them warmer, and more like a sepia or burnt sienna drawing. M. Vidal, it is true, in a communication to the Photographic Society of France, describes a method of toning Eastman's bromide paper with platinum (*British Journal of Photography*, vol. xxxiv., p. 158), but this only renders the tone colder and bluer than before, an effect hardly to be desired except in some special cases. There can be no doubt that it is desirable to have some method of producing a warm tone in bromide prints, and this is especially felt by those people who live in a large and foggy town, and are engaged in the daytime, and who, in consequence, are compelled to do all their printing by artificial light. As I myself am thus situated, I proceeded to try some experiments with this end in view. It has been said that if a bromide print be considerably over-printed, and then developed with a very weak ferrous oxalate developer, the result is to produce a picture of a much warmer tone than usual. I tried this in every way I could think of, but only succeeded in producing flat, uninteresting pictures, which, at the best, were a muddy, disagreeable brown.

The Eastman Company, in their instructions for making transparencies by transferotype, give a method of toning these with uranium; in fact, they recommend the well-known uranium intensifier. It seemed reasonable to suppose that if this would work well on a gelatine film on glass, it would also work on paper. Application was made to the Eastman Company to know if they had tried it, but they declared it was impossible to get a satisfactory result on paper, as the solutions produced an ugly, yellow stain that could not be removed. However, I thought it worth while to try the experiment, and proceeded as follows:—A print was made, developed, and fixed, and then thoroughly washed in several changes of water under the tap. It was then passed into a weak solution of sulphuric acid to destroy the last traces of hypo and remove any slight traces of the iron solutions that might still hang to it. It was then thoroughly washed again, and passed into a mixture of equal parts of a 1 per cent. solution of uranium nitrate and a similar solution of potassium ferricyanide (red prussiate of potash). After a few moments, the prints visibly began to change in colour, and when it seemed that the change had proceeded as far as it would, it was well washed and passed into a clean hypo bath for a few minutes. The colour again changed, becoming much redder, and, after washing, the print was found to have acquired a tone somewhat similar to that of a burnt sienna drawing. The whites were slightly stained, but not yellow; in fact, the print much resembled an engraving on India-toned paper. Having so far succeeded, I was led to try and modify the tone in various directions. I first found that the whites might be rendered perfectly pure again by passing the print into a bath containing alum and sulphuric acid, after washing out the hypo. Then that a considerable difference could be produced in the final result by not pushing the action of the toner (or intensifier) so far. And, lastly, that by omitting the hypo bath entirely and passing the print at once into alum, or, if necessary, alum acidified with sulphuric acid, a rich brown with an almost purple tinge could be obtained. It is possible, then, to produce a considerable range of tone, varying from a blue-black to a red-brown. The process will be as follows:—

Make up two stock solutions, No. 1, 10 per cent. of uranium nitrate; No. 2, 10 per cent. of potassium ferricyanide (not ferrocyanide). No. 1 will keep indefinitely, and No. 2 will keep very well if well stoppered and in the dark; but as it is somewhat liable to change, only a small quantity should be made up at a time. It is as well also in making this up to pick out bright clean crystals of the red prussiate.

The print to be toned should be very slightly under-exposed, to allow for the intensifying action of the toning bath. It must be fixed as usual, and then well washed and passed into a weak acid bath. This may conveniently be sulphuric acid, and the strength immaterial—about one or two per cent will do. Wash out the acid, and lay the print face up in a clean developing dish. Make up the toning bath of twenty parts water, one part No. 1, and one part No. 2, and pour this on to the print immediately it is mixed. When the action has gone far enough, the toning is poured off, the print rinsed under the tap, and transferred to a new hypo or alum bath, according to the colour desired. The



toning solution is sufficient for two or three prints, one after the other, but it will not keep for more than a few minutes, and the later prints toned in it are likely to be stained.

The action of the toning solution is not difficult to comprehend. It is, of course, the same that takes place when a negative is intensified by this method, and most easily understood by first considering the reducing action of potassium ferricyanide. Chapman Jones's "Science and Practice of Photography" shows that in the latter case the finely-divided silver of the image partly reduces the ferricyanide, forming in general ferrocyanides of potash and silver. In the presence of nitrate of uranium, insoluble ferrocyanide of uranium is at once formed, giving an image of the well-known chocolate-brown colour of this salt. The ferrocyanide of potassium formed in the above reaction probably accounts for a loose deposit of the brown substance that frequently forms on the dark parts of the print, and sometimes gives trouble by staining the white around these.

There are several advantages to be obtained by the application of this method, besides the alteration in the colour of the finished print. As might be expected, the solutions harden the gelatine film, and so render frilling and blistering in warm weather less likely to occur. But the most remarkable advantage appears to be that a greater range is given to the print; a print that is flat and uninteresting before being toned, will be considerably improved in depth and sparkle by it. For instance, it is very hard, and in some cases impossible, by any amount of dodging, to get a decent rendering of distance in a bromide print without "bringing up the shadows" in the foreground completely; but if such a negative be printed for the best result in the foreground, and then toned in this manner—or perhaps it should rather be called intensified—the foreground is not hurt, but rather improved, and the distance is brought up and made visible. In fact, I would say that if uranium is used with judgment, the curve representing the range of bromide paper, as described last week by Mr. Lionel Clark, may be made considerably flatter, and brought much nearer to that of alpha, or silver paper, i.e., a much denser negative may be used to print from.

Of course the process has its drawbacks, as every process must, and the most troublesome cause of failure is the presence of minute traces of an iron salt in the paper. However carefully the washing and scouring may be carried out, there are occasionally some spots to which the iron salts of the developer cling so tenaciously that it is practically impossible to remove them, and wherever there is one of these, a pale blue mark will appear on the finished print. It is obvious that this must be so, since, during the toning process, both ferricyanides and ferrocyanides are present; hence Prussian blue will be formed whether iron is present in the ferrous or ferric state. Also, if in the after-treatment a print be brought into contact with iron before it is dry, a blue stain will result. In fact, in one case I spoilt a whole batch of prints by blotting them off on paper that was almost imperceptibly stained with iron-mould. Another objection to the process has already been referred to—viz., the tendency of the brown precipitate to spread to the high lights round any large dark patch in the print. This may generally, however, be avoided by using an absolutely fresh toning-bath for any print in which it is likely to occur, and allowing the dish to remain still during the operation. If this is done, and the direction in which the solution is poured off chosen with judgment, the high-lights may be kept clean.

#### ON THE MEASUREMENT OF THE SENSITIVENESS OF SILVER SALTS TO THE SPECTRUM.

BY CAPTAIN W. DE W. ADNEY, C.B. R.E., F.R.S.

WITH the exception of my own experiments described in the "Proceedings of the Royal Society," I believe that no one has made a quantitative measurement of the chemical action of the spectrum on the different salts of silver, dyed and undyed. The attempt I have quoted above was successful as far as it went, the principle then employed being to use a large number of plates of the same brand, and expose them, one by one, in a patch of monochromatic light, of differing colours of the spectrum. The plates were then developed together, and the sensitiveness to each colour noted. This method is fairly exact, but it cannot pretend to the exactitude of measurement of the sensitiveness when all the exposures are made on the same plate, and it is this which I have secured. In a paper read before the Photographic Society of Great Britain, in January, 1887, I

showed how the density of a negative taken in the sensitometer could be measured. Briefly, it may be described as an "optical lantern method," by which an image is thrown on a white screen, a rod placed in the beam of light casting a shadow; a mirror placed on one side of the source of light throws another beam of light from the same source on to the screen, illuminating the first shadow, and casting a shadow of its own, which is in its turn illuminated by the direct beam of the lantern. It is this method which I have turned to account in what, perhaps, is an obvious manner—at least, it was obvious to me when I found out the method, and indeed I indicated it in the paper already referred to, and it has only been lack of time, owing to other scientific work, which has prevented me making measures of the photographic spectra before.

The following diagram (fig. 1) will recall to mind the apparatus employed:—

A is the source of light—gas, paraffin, or other lamp; B is a lens of about 9 inches focus, used as a condenser; C is a double frame for carrying the negative, N, which has an upward and side motion, so that any part of the negative may be brought in front of the condenser; D is a lens on a stand, used to focus the negative on the screen E, which is black except one small square as shown, where the image of the part to be measured is thrown; F is one of a series of diaphragms used with D for the purpose of sharpening the image and reducing its brightness when required; H is the rod used to cast the shadow on the white patch; G is a flat mirror reflecting a beam also on E; K is the rotating apparatus placed in the path of the light reflected from G, to diminish it at pleasure; M is the small electro-motor which drives K. The rod H is so placed that the shadows cast by the beam from G, and coming through the negative, just touch, and the two are equalised in brightness by means of opening more or less the rotating sectors K.

I will now describe the plan I have adopted:—1st, to procure the photographed spectra; and 2nd, their measurement.

It is well known that sun-light abounds in dark (Fraunhofer) lines, which, when magnified on the screen, would render the measurement of any particular part of the spectrum difficult, unless the spectrum be slightly out of focus, or the slit of the spectroscopic be wide. All that can be done with a sharp negative is to take an average of the spectrum light, paying no attention to these lines. Another point militating against the employment of sun-light is the fact that at no two times of the day can it be certain that the light is the same, and comparison of the effect of a series of rays, but of varying intensities in each, would give no clue to what we wish to ascertain.

To avoid this, I have used sources of light which are not open to this objection: 1st, the crater of the positive pole of electric light; and 2nd, common gas-light. The former is excellent for eyework, but it is somewhat inferior for photographic purposes to the latter, for the reason that in the extreme violet and ultra-violet of the spectrum carbon bands appear which photograph more strongly than the continuous spectrum. The measurements show, however, that the effect of these bands can be eliminated, and the photographic value of the continuous spectrum shown with great precision.

With each photograph of the spectrum taken with the electric light, a scale of exposure has to be also taken on the same plate, in order that the two may be developed together.

The order of proceeding was as follows:—The plate to be tried was exposed in photo-spectroscope for 10 seconds, the light being reduced to  $\frac{1}{10}$  of its value by placing its rotating sectors in front of the slit. The plate was then placed in another slide, which enabled different parts of a strip of the unexposed surface to be exposed through a square aperture for varying times. These different exposures were given to an argand paraffin lamp, placed 8 feet off the slide. The times of exposure were—7 seconds, 15 seconds, 30 seconds, 60 seconds, 90 seconds, 120 seconds, 180 seconds, 240 seconds, and 300 seconds. The plate was then developed in the ordinary manner, and on the same negative was a spectrum, and beneath it a scale of density corresponding to different times of exposure. [In the above (fig. 2) the continuous spectrum of gas-light is shown, the arc spectrum and the scale.] When the light is as bright as that used, increase in exposure is practically identical with increase in intensity of light; that is, if a certain density of deposit is obtained by an exposure of 2 seconds with a certain intensity of light, the same density of deposit is obtained if the light be doubled in intensity, and only half the exposure be given.

That there is no difference between an exposure for a given time, with a given intensity, and a proportionate increase of ex-



posure with diminished intensity, when, as I have said, the exposures are measured by seconds, I have proved. In order to test this, and likewise the effect of intermittent exposure having a total equal to given exposure with the same intensity, a variety of experiments have from time to time been made. The following is a recent example.

An incandescence lamp, rendered incandescent from accumulators during a time of day during which no other lamps were used, was used as a standard light. It was placed exactly 10 feet from the plate, and varying exposures given to portions of it. On the same plate another series of exposures were given at distances varying from 2.5 to 10 feet, for 15 seconds, very accurately timed. A third set of exposures also in the same plate were made, fixing the lamp 5 feet from the plate, and the rotating sectors were opened with different apertures to correspond with one minute's exposure in the first set of these expo-

sure. The plate was then developed, and the densities of the resulting images measured. The following table gives the results;—

Lamp 10 ft. distant.		15 sec. exposure		1 min. exposure, lamp at 5 ft.	
Exposure	Density	Lamp at	Density	Sectors at	Density.
15 sec. ...	77	10 ft. ...	78	11½ ...	77
30 " ...	52	7 " ...	51	22½ ...	53
60 " ...	29½	5 " ...	28½	45 ...	30
120 " ...	16	3 " 5 in. 15		90 ...	15.5
180 " ...	12	2 " 10½ in. 12		135 ...	11.5
240 " ...	10	2 " 6 in. 10		180 ...	10

These results should be identical; and, considering the errors that may arise, 1st, From the different thicknesses of film

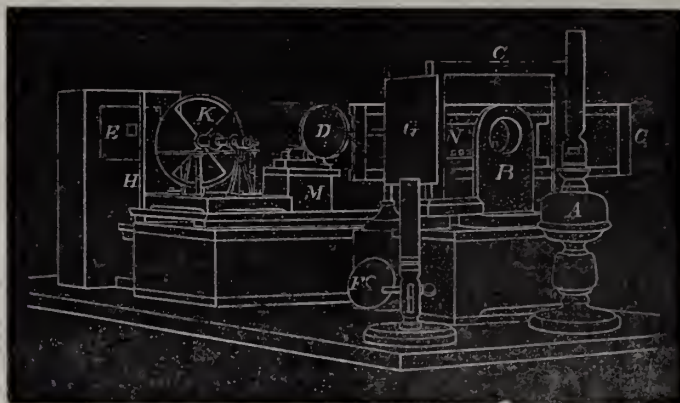
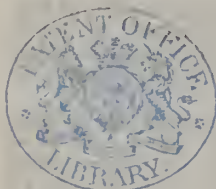


Fig. 1.

at the different parts; 2nd, from a small variation in the exposure, or distance of the plate from the lamp; and 3rd, from defective measurement of the density, the results are as concordant as can be expected.

The negative having been obtained, the next step is to measure the spectrum and the scale. In order for the measurements to

be of any utility it is necessary to know the part of the spectrum measured, and reference is always, at all events nearly always, made to the Fraunhofer lines. To ascertain the whereabouts of any particular portion of the photographed continuous spectrum, another spectrum was used. Instead of the source of light being the crater of the pole of the electric-light, the arc

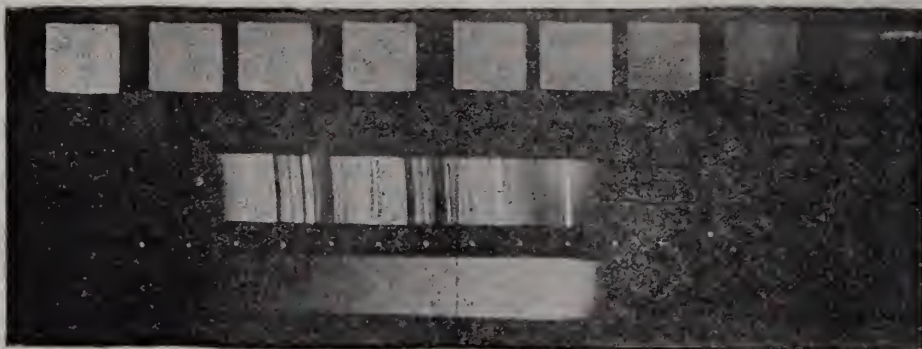


Fig. 2.

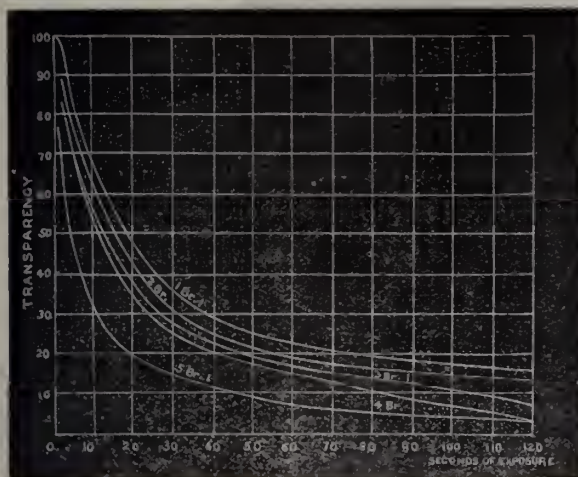
formed between the two poles was used, having a mixture of lithium and sodium vapourised in it. This gave a beautiful spectrum of lithium, sodium, and carbon, the lines being very strong (see fig. 2). In the spectrum to be measured the carbon bands in the violet were well marked as they were in the second, and hence from the second the position of the different lines, and therefore their wave lengths, could be at once laid down on the spectrum. From the carbon band above alluded to a scale of  $\frac{1}{4}$  and  $\frac{1}{8}$  inch was laid off along the spectrum to be measured. The negative was then ready to be placed in the lantern. The negative was magnified some four times by its means. A small white screen  $\frac{1}{4}$  inch broad and  $\frac{1}{4}$  inch high, bordered with black, was now placed in the image, and a knitting needle  $\frac{1}{8}$  inch thick

placed in front, casting a shadow on one side of the screen, as explained before. The reflected beam cast another shadow of the same needle on the other half of the screen. In front of the latter was the motor with movable sectors which enabled the shadows to be equalised. The density of the whole length of the spectrum at the marked points was read off by this plan. The scale was next read in the same manner, a slightly thicker rod and wider screen being used for convenience sake in this case. The measurements were now complete, and nothing remained to do but to plot the curves. This was done as follows (see fig. 3):—The seconds were laid off on squared paper in a horizontal line, and the angular aperture of the sectors necessary to balance the shadows were used as ordinates.



The points thus obtained were joined by a curved line, from which the value of the densities of the spectrum could at once be obtained.

Gas-light also commended itself to me as being a useful light to use, since it was easy to take a spectrum of sun-light and compare it with that of gas-light. Having ascertained the behaviour of the sensitive salt in the spectrum of gas-light, it is easy to calculate what the effect of the same "quality" of sun-light would be on the same salt. The only difference in procedure in using gas-light was that it became necessary to photograph beneath the gas-light spectrum, the spectrum of the sodium, lithium, and carbon lines on the same plate immediately below it, since there were no carbon bands in the former to use as fiducial lines. This plan gave the desired knowledge of the position of the spectrum in reference to the measurements of density of deposit. The exposure to the gas spectrum was prolonged to ten minutes, and the scale was obtained by the same time exposures. The only drawback to the gas spectrum is the want of ultra-violet rays unless the exposure be exceedingly prolonged; a reference to the electric light spectrum, however, enables a calculation to be made of the sun-light value of these rays.



*Fig. 3.*

If a reference be made to the intensities of the different rays as they exist in sun-light and gas-light (see "Phil. Trans.," 1838), it will be seen that no matter where the maximum or minimum of photographic effect comes, their shift in changing from one source of light to the other will be perfectly inappreciable; the relative photographic effect will, however, vary at different parts of the spectrum.

(To be continued.)

## Patent Intelligence.

### Applications for Letters Patent.

- 17,108. GEORGE HEELEY, Victoria Works, Victoria Street, Sheffield, for "A Shell Lime Cylinder or Disc to be used for Lime-light purposes."—November 24th, 1888.
- 17,198. PERKEN, SON, and RAYMENT, and WALTER PEAD, 34, Southampton Buildings, London, W.C., for "Improvements in Photographic Shutters."—November 26th, 1888.
- 17,298. GEORGE SYLVESTER GRIMSTON, Claremont, Glenluce Road, Westcombe Park, S.E., for "Improvements in Instantaneous or Time Shutters for Photographic Purposes."—November 28, 1888.
- 17,328. HENRY JOSEPH REDDING, 34, Southampton Buildings, London, W.C., for "Improvements in Photographic Roll-holder Cameras and in Photographic Shutters and View Finders."—November 28, 1888.
- 17,377. EDWARD WOODS, 43, Southampton Buildings, Chancery Lane, W.C., for "Improved Combined Letter Rack and Photograph Frame."—November 29, 1888.

17,380. DENIS McNAMARA, 9, Westland Row, Dublin, for "Improvements in Photographic Cameras."—November 29th 1888.

### Specifications Published during the Week.

- 9,884. FRANCIS EAST, Chair Manufacturer, 45, and 47, Nelson Street, Dundee, County of Forfar, Scotland, for "A Wall Bracket or Case for Exhibiting Photographs, Pictures, and similar Articles."—Dated July 7th 1888.

An ornamental wall bracket in various sizes—having shelf on top for holding ornaments, hooks &c., two narrow pieces of wood or metal are fixed horizontally on face of bracket having two grooves in each piece in which the photograph slide and glass front are placed, and which are put in or taken out from the end of aforesaid grooves, the grooves in the upper horizontal bar being cut on the under edge, and the grooves in the lower horizontal bar being cut on the upper edge of bar. The ends are closed in by a metal or wood plate, in or on which is fixed a piece of soft felt or other material for excluding dust.

- 13,267. FRANK BISHOP, of the firm of Marion and Co., of Soho Square, in the County of Middlesex, Wholesale Stationers, for "An Improved Machine for Use in Beveilling and Gilding the Edges of Photographic and other Cards or Mounts."—  
Dated September 13th, 1898.

Relates to apparatus for use in bevelling and gilding the edges of photographic and other cards or mounts. Such cards are at present usually held in a pile in a screw-clamp or press similar to the presses used by book-edge gilders, and the cards are chamfered or bevelled by means of a cutter, while the workman holds the press in a slanting position. There are certain objections to the employment of such clamps or presses, the chief of which is the comparatively small number of cards which can be properly held by a single press, owing to the fact that the cards must be arranged so that their edges may overlap one another. If more than a certain number of cards be placed in the press at one time the pile of cards would be liable to become displaced by the pressure of the screw upon them, and it is therefore necessary to employ a large number of such presses.

The object of the present invention is to provide apparatus capable of holding a considerable number of cards or mounts.

The apparatus is composed of a series of carriers for the cards constructed as described in the full Specification, mounted to slide upon a horizontal bed, and serving to sub-divide the cards into separate packs. The whole of these carriers and the cards which they contain, are secured together by a pressure screw, which is applied to the front carrier and clamps the intermediate carriers and the cards together against the rear carrier, which abuts against a stop on the bed of the apparatus. By this means the cards are securely held to form a solid structure capable of being slid along the bed of the machine, to bring the edges of the packs of cards successively under the action of the cutter.

These carriers each consist of a saddle-piece secured by dovetail guides to the bed of the machine, and an inclined back made in one with the saddle-piece, against which each pack of cards rest. The adjacent carriers are connected together by fingers or teeth on the one carrier, engaging with corresponding teeth or fingers on the other carrier, so that the whole assemblage of carriers is extensible, and the cards may be placed in the carriers without liability of falling between them.

The cutter may be the ordinary hand cutter, but the inventor preferably employs a rotary cutter or milling tool with helical blades mounted to rotate in bearings above the cards. The carriers would be drawn upon a horizontal table beneath this cutter, so as to prevent the edges of the cards, which project slightly above the top edges of the backs of the carrier, to the action of the cutter.

The apparatus may be used for holding cards for gilding the edges. In this case the backs of the carriers would be vertical.

Patent stated in the Official Journal to have become  
Void by Non-payment of Duty. Non-payment of  
Fourth Year's Fee.

11.556 of 1884. E. HIMLY.—Photography by Artificial Light.

Patented in America.

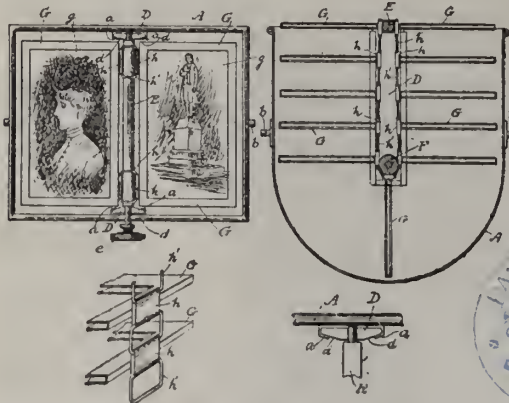
- 392,292. JOHN J. SLOAN, Chicago, Ill., assignor of one-third to Frank Saunders, same place, for "Photograph Exhibitor."—Filed July 13th, 1888. Serial No. 279,857. (No model).  
*Claim.*—1. The combination, with the case A, of one or more



endless chains having links of equal length, frames G, rigidly attached to each alternate link, shafts E and F, the former of which is square in cross-section, plates D D, having bearings therein for mounting said shafts, and suitable grooves within the case for the reception of said plates, substantially as shown and described.

2. In a photograph-exhibiting case, the combination, with the case, of the flanges *a a*, plates D D, shafts E F, mounted in bearings formed in said plates, endless chains having links of equal length, and a series of card-holding frames rigidly attached to the alternate links of said chains, substantially as shown and described.

3. In a photograph-exhibiting case, the combination, with supporting-grooves in the sides of the case, endless chains hav-



ing links of equal length, card-holding frames attached to every other one of said links, a square and a round shaft, and a knob for rotating the former, of the plates D D, having bevelled or rounded surfaces *d* upon their inner faces, substantially as shown and described.

392,586. PASCAL G. CASPIAN, Philadelphia, Pa., for "Adjustable Frame for Holding Printing Mediums or Films."—Filed Feb. 17, 1887. Serial No. 227,948. (No model.)

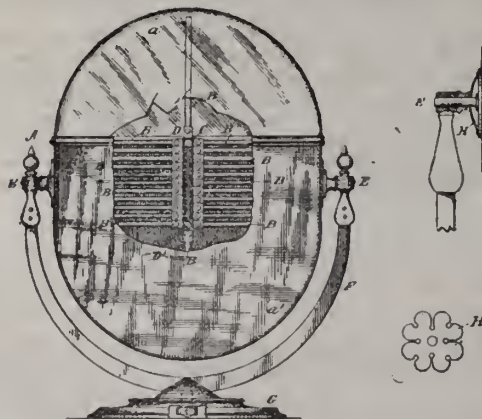
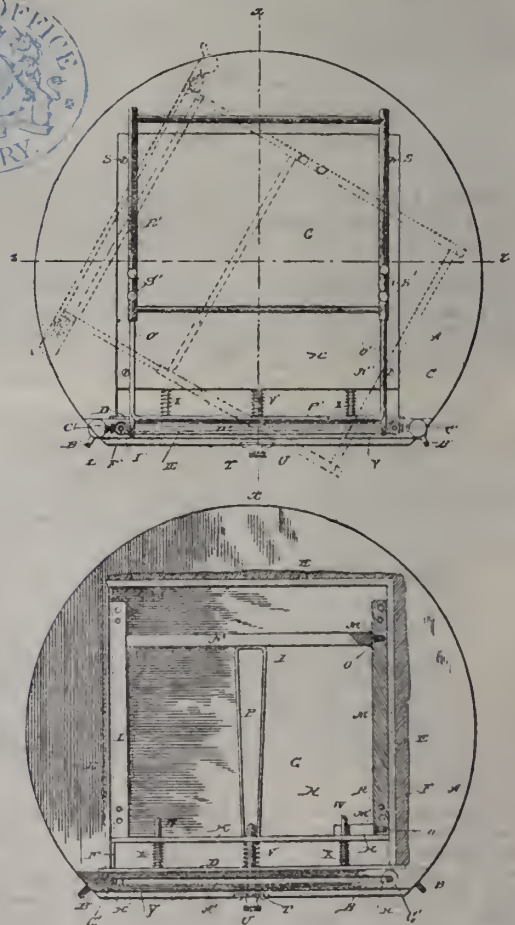
Claim.—1. The combination of the base-board, the bed-bar to which the frame to carry the printing-film is attached, and the

end and provided with a cover *a* for closing the open end, an endless series of frames flexibly connected together and supported within the case and provided with means for turning them, a suitable supporting-frame, and journals E, extending from opposite sides of the body portion *a'* and supporting it pivotally on the frame, whereby the body portion is oscillatory on its support and adjustable thereon to bring the open end, through which the photograph-frames are projected, to a desired angle for convenience of display, substantially as described.

3. A tilting photograph-case comprising, in combination, a body portion *a'*, open at its upper end and provided with a hinged cover *a*, an endless series of frames flexibly connected together and supported within the case and provided with means for turning them, a stand G, a yoke F supported on the stand, and journals E, extending from opposite sides of the body portion *a'* and supporting it pivotally on the yoke, whereby the body portion is oscillatory on its support and adjustable thereon to bring its open end, through which the photograph-frames are projected, to a desired angle for convenience of display, substantially as described.

392,586. PASCAL G. CASPIAN, Philadelphia, Pa., for "Adjustable Frame for Holding Printing Mediums or Films."—Filed Feb. 17, 1887. Serial No. 227,948. (No model.)

Claim.—1. The combination of the base-board, the bed-bar to which the frame to carry the printing-film is attached, and the



frame, and journals E, extending from opposite sides of the body portion *a'* and supporting it pivotally on the frame, whereby the body portion is oscillatory on its support and adjustable thereon to bring the open end, through which the photograph-frames are projected, to a desired angle for convenience of display, substantially as described.

2. A tilting photograph-case comprising, in combination, a body portion *a'* rounded toward its base and open at its upper

clamping devices to secure the bed-bar to the base-board at any desired point, substantially as described.

2. The combination of the bed-bar, having the slot *A'*, the frame D', having the clamping studs working in the said slot, and thereby adapted to adjust the frame D' on the bed-bar, and the frame to carry the printing film pivotally connected to the frame D', substantially as described.

3. The combination of the rocking frame N', having the parallel



horizontal bars O', and the film-frame R', secured to said bars O' and detachable therefrom, substantially as specified.

4. The combination of the rocking frame N' and the film-frame R', secured thereto and adjustable thereon, substantially as described.

5. The combination of the base-board having the opening C and the track or guide bars F in the sides thereof with the table or block G, having the frame engaging the said guide-bars, one side of the said frame being laterally adjustable to take up wear, substantially as described.

6. The base-board, having a rectangular opening C, and formed with guides or ways, combined with the sliding table G working in the guides or ways in the walls of the opening C, as set forth.

7. In combination with the base-board A, having the opening C, provided with the guides or ways, the sliding table G, movable in the guides or ways of the said opening, the pins W, the springs X, the screw U, and the film-holding frame, as set forth.

8. In combination with the base-board A, having the opening C, the sliding table or block G movable in the opening C, said table or block having one of its sides laterally adjustable, as set forth.

9. The combination of the base-board, the rocking frame N' hinged or pivoted thereto, and having the arms O' and the film-frame R', having the longitudinal openings in its sides to receive the said arms, for the purpose set forth, substantially as described.

10. The combination of the base-board, the rocking frame N' hinged or pivoted thereto, the film-frame, and the set-screws S, securing the film-frame adjustably to the rocking frame, substantially as described.

## Correspondence.

### THE WEST LONDON PHOTOGRAPHIC SOCIETY.

SIR,—A preliminary meeting for the formation of the above Society will be held on Friday, December 14th, at 8 p.m.

Owing to the difficulty that has been experienced in finding a suitable room for holding this meeting near the Broadway, Hammersmith, it has been decided to hold it at the "Chiswick Hall," High Road, Chiswick.

Trams pass the door, and access by rail is from Turnham Green Station.

All interested are invited to make every effort to attend.—Yours faithfully,  
THEOPHILUS B. MARCH,  
G. F. BLACKMORE.

"Pentile," Elliott Road, Chiswick, W.

## Proceedings of Societies.

### BATH PHOTOGRAPHIC SOCIETY.

A MEETING, attended by about two hundred ladies and gentlemen, was held at 10, Quiet Street, Bath, on Wednesday evening, the 28th ult., G. F. POWELL presiding.

The CHAIRMAN, in opening the proceedings, referred to the rapid progress made by the Society, and of the energy displayed by the members. He paid a graceful tribute to the abilities of those who were about to entertain them that evening, but he did not think they ought to lean too heavily upon the generosity of a few of the members who were always ready to work in the general interest.

The HON. SECRETARY (W. Middleton Ashman) exhibited and described the working details of Collins' new portable camera and three-fold tripod stand. This instrument was on view at the late Pall Mall Exhibition, and, it will be remembered, is of the Kinnear pattern; it contains some novel adjustments whereby all the swing arrangements, sliding and focussing, are controlled by the front board. The base-board is fitted with McKellan's patent turntable; half-plate size, weighs 3 lbs., and focus extends from three to sixteen inches.

FRIESE GREENE (London) gave a demonstration of enlarging on Morgan and Kidd's opal plates. Having explained the nature of the apparatus used—an enlarging lantern, with paraffin lamp,

condenser, &c.—and referred to the advantage of a good diffuser, such as a plate coated with a mixture of kaolin and collodion, he impressed upon the members the peculiar suitability of opal vignettes as a method of reproduction. The usual plan of vignetting was drawn attention to, after which a half-plate portrait negative was enlarged to 15 by 12 on a screen of opal covered with white paper, which Mr. Green stated was the best focussing screen to use. The lights were then turned down, and an opal plate exposed, developed with ferrous oxalate, cleared, and fixed. This was afterwards passed round among the audience, and proved to be of the highest quality.

PHILLIP BRILAM praised the manner in which the demonstration had been given, and hoped others in the locality would come forward with similar demonstrations, and give the members similar instruction.

C. H. TALBOT, of Lacock Abbey (son of Fox Talbot) said he had great pleasure in being present to witness the demonstration. He did not know how many of the assembly understood the details of that particular process, but he had to confess to his own ignorance of it previous to that evening. He was glad to make the acquaintance of Mr. Greene in connection with the foundation of the Bath Photographic Society, and he felt quite sure that gentleman was ready to go to any amount of trouble to push forward the interests of the Society.

W. PUMPHREY displayed a large number of pictures on the screen by means of his oxy-hydrogen lantern. He used a mixed jet and compressed gases from the cylinders, which gave a splendid illumination, and in passing called attention to points in the choice of a subject, which was most instructive.

Series lent by the Chairman, Austin J. King, and John Dugdale, mostly wet collodion, were first shown; then followed selections from Mr. Pumphrey's own stock, including instantaneous pictures of cyclists, trains in motion, cygnets, street and rural scenes; Switzerland, North Germany, and microscopical sections, some being from film negatives.

AUSTIN J. KING, and Canon WILLIAMS each spoke of the instructive amusement afforded by the lantern; and the making of transparencies in the winter evenings from negatives produced in the summer months recalled many pleasant holiday reminiscences.

Next meeting December 19th, at Royal Literary and Scientific Institution.

### DUKINFIELD PHOTOGRAPHIC SOCIETY.

The usual monthly meeting was held at the Society's Rooms on Tuesday evening, November 27th, T. LEES (Vice-President) in the chair.

Messrs. Basil Hall and Joseph Hutchinson were duly elected members, after which it was announced that the Council had decided to extend the date for sending in prints for the competition to the third week in January; and that the exhibition of members' work, &c., would be held at the January meeting.

WILLIAM JENKINSON and the CHAIRMAN then gave an interesting and perfectly successful demonstration of enlarging by the aid of a sciopicon lantern. The paper used was Morgan and Kidd's, and the subject a capital view of "Hornby Castle," near Lancaster, from a quarter-plate negative by the Chairman. The enlargement was finished in view of the members, who expressed themselves highly pleased at the artistic result obtained.

### CAMERA CLUB.

On Thursday W. WILLIS read a paper entitled, "A Lesson in the New Cold Bath Platinotype Process," F. MACHELL SMITH occupying the chair. The lecture was illustrated by examples, and a complete demonstration of the process was given, a large number of exposed prints being developed before the meeting. W. Willis stated what he recommended as a standard developer, a great point in this being that the cost of the development was materially reduced, without apparent deterioration in result. By varying the proportions of the development and the platinum salts within certain limits, half-tone and a cold colour, or increase of vigour and a warm colour, were obtainable.

A discussion followed, in which S. BOURNE strongly advocated research in the direction of a reliable printing-out method on the platinum basis; W. Willis replying that although it might be true that printing-out processes might be vastly improved, inherent defects in printing paper so prepared must always prevent the best quality of print being obtained thereon.



The subject for Thursday, 13th December, will be "Photographs of Nebulae," when A. A. Common will deliver a lecture. Meeting at 8 p.m.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

The annual dinner was held on the 29th ult. at the Mason's Hall Tavern, J. TRAILL TAYLOR presiding.

After the usual loyal toasts the CHAIRMAN proposed "The London and Provincial Photographic Association and kindred Societies," responded to by J. J. Briginshaw. The Parent Society was replied to by W. England, the Photographic Club by A. Cowan, the Camera Club by F. P. Cembrano, the North London Photographic Society by W. Cobb, and the Convention by S. G. B. Wollaston. The other toasts were "The Visitors" and "The Chairman," proposed by F. A. Bridge.

Numerous songs and recitations were contributed during the evening by F. A. Bridge, W. Cobb, A. Cowan, S. Moran, W. Prestwich, J. Goodwin, and J. J. Briginshaw.

### Talk in the Studio.

CAPT. ABNEY "ON THE MEASUREMENT OF THE LUMINOSITY OF COLOURED SURFACES."—In a communication to the Royal Society, General Festing and the author have described a method of comparing the intensity of the light of different parts of the spectrum reflected by various pigments with that reflected from white; luminosity curves have been constructed, the areas of which give comparative measures of the total luminosities. This method of comparison is accurate, but requires considerable time, and the author has devised a more rapid process. The coloured surface, whose luminosity is to be compared with white, is placed beside a white patch within a dark box. A direct beam of light passes through an aperture in the box, and a black rod casts a shadow on the coloured patch; another beam from the same source is reflected at an angle, and forms a shadow of the same rod on the white patch, the junction of the two shadows coinciding with that of the two surfaces to be compared. In the path of the direct beam is placed a rotating disc with angular openings, adjustable whilst rotating by a simple lever, and by this means the white patch can be made to appear too light and too dark in rapid succession. By gradually diminishing the range of oscillation of the lever, a position of equal luminosities can be found. The coloured surface is now replaced by a white one, and the adjustment again made, and from the angular apertures required in the two cases the relative luminosities are determined. Comparisons made in this way (the numbers relating to which are given in the paper) with emerald green, vermilion, French ultramarine, &c., gave results in close agreement with those deduced from the luminosity curves obtained by the spectrum method.—*Chemical News* report of meeting of Physical Society.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—Ordinary meeting at 5A, Pall Mall East, Tuesday, December 11th, at 8 p.m., when the adjourned discussion will be taken on Captain Abney's paper, read November 13th; J. Spiller reading a short paper on the subject.

LIVERPOOL AMATEUR PHOTOGRAPHIC SOCIETY.—The annual meeting was held on November 29th, B. J. Sayce in the chair, and a most encouraging report was read.

THE HUDDERSFIELD PHOTOGRAPHIC SOCIETY.—This Society, the formation of which was mentioned on page 750, is now fairly organised, and a satisfactory business meeting was held on Wednesday, 25th November last.

THE CARDIFF AMATEUR PHOTOGRAPHIC SOCIETY.—The Society announces the following arrangements for the Winter Session, 1889:—

January	9th—	...	"Optics"	...	Alex. Kellar.
			23rd—"Hydroquinone as a developer"	...	C. H. Murrell.
February	6th—"Transferotype"	(Eastman process)			W. H. Kitchin.
			20th—"Llantwit Major"	...	John Storie.
March	6th—"Photographic Chemistry"				Jesse Williams.
			20th—"Photography as an Art"		S. W. Allen.
April	3rd—"The Lantern, and how to work it"				W. Windsor.
			17th—"Mechanical Processes"		W. Bush.
May	1st—"Spiritualistic Photography"				D. Josti.
			15th—"Platotype Printing"		S. W. Allen.
PHOTOGRAPHIC CLUB.—The subject for discussion on Dec. 12th will be "The Manipulation of Bromide and Chloride Papers."					

### To Correspondents.

\* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.," while Advertisements and Business letters should be forwarded to "PIPER AND CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

C. HERTON LEWIS.—1. In the absence of knowledge as to the composition of the commercial preparation you refer to, we cannot give an opinion. The well-known method of Clark is available for all, and is certainly far less costly than the use of the nostrums you refer to. 2. The spongy iron is prepared from hæmatite ores by heating to redness, and passing over reducing gases, such as hydrogen and carbon monoxide. Pyrolusite is the native peroxide of manganese. 3. A charcoal filter intelligently used is preferable. At intervals, the charcoal must be taken out and exposed to the air, and at longer intervals it requires re-burning.

LITHO. PHOTO.—The addition of a little wax is an advantage, as affording a better resist to the acid than an ordinary printing ink, say one part of wax to four of ink; melt the wax first and stir the ink in. For thinning, a volatile medium such as benzol is better than oil, as it leaves the ink more solid on the lines; but it is far more difficult to work with an ink thinned with benzole than when one of the usual oils has been used.

M. R. BELLMAN.—We are quite at a loss for any explanation, unless we assume that you were mistaken as to the alkalinity of the solution.

J. T. M.—You will find a paper on the subject in the YEAR-BOOK for 1889.

CORK AMATEUR.—You will much favour us if you will post us a copy of the newspaper containing the notice. The cutting hardly enables us to judge of the general character of the paper.

DRAUGHTSMAN.—There is no process which gives black lines which is not very considerably more troublesome than the ordinary cyanifer process, and the best of the black line processes is that to which you refer. If you read German you should obtain a small book on "Lichtpaus," published by Dr. Liesegang, of Dusseldorf.

T. L. S.—It will keep practically unaltered, although a trace of the gold may be deposited.

T. ILLINGWORTH.—There are so many ways that the sketch may have become copyright that we can suggest no satisfactory means of ascertaining. If, for example, it was originally published as part of even the most obscure magazine or book, it is copyright.

ASSISTANT.—Mix a little boiled oil with the paint, and at the same time increase the proportion of pigment—if this latter is necessary—to prevent it drying with a gloss.

EMULSION.—You will find particulars in Abney's "Instruction in Photography."

L. R. T.—The paper you refer to is not published under the authority of the Camera Club, although this might, perhaps, be supposed from the notice you enclose.

GREENWAY.—No intensifier, properly so called, does what you say. We suspect that you have failed to wash properly between the several stages.

C. NORTHWICH.—1. If the solution is alkaline, the oxidation goes on very rapidly; but if a trace of nitric acid is added, the preparation may be kept several weeks without change. Two drops to each ounce of solution is quite sufficient. 2. Imperfect fixation is the cause. In cold weather the hyposulphite solution acts very much more slowly, or may be you have used freshly prepared solution which has not had time to reach the normal temperature.

L. TANNER.—Next week if possible, but soon at any rate.

### The Photographic News.

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For Advertisement Scale see page v.

Advertisements should be forwarded (prepaid) to PIPER AND CARTER, 5, FURNIVAL STREET, HOLBORN, E.C., to reach the office not later than noon on Thursday. A fee of 6d. must be forwarded when the Publishers are expected to receive and forward replies to Advertisements; and when they undertake the receipt of replies, they must be entrusted with the name and address of advertiser, for revelation to applicants, in case they may deem it necessary.



# THE PHOTOGRAPHIC NEWS.

Vol. XXXII. No. 1580.—December 14, 1888.

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### FORTHCOMING PHOTOGRAPHIC EXHIBITIONS IN THE METROPOLITAN DISTRICT.

THERE has been a tendency of late for photographic exhibitions to multiply in number and to become of proportionately less importance and interest; but of the three approaching exhibitions of which photographers are now receiving notices by post, that which promises to be of exceptional interest and importance is the exhibition to be held in January at Richmond.

This exhibition is under the patronage of the Princess Mary of Teck, the Duke of Teck, and the Princess Frederica, and it will be held on January 8th, 9th, 10th, 11th, and 12th of January, 1889, in the Castle Assembly Rooms, Richmond. The Princess Mary of Teck will open the exhibition on Tuesday, January 8.

The circular calls attention to the fact that this exhibition is not promoted with any commercial object, but in the event of there being a surplus it will be equally divided between the Richmond Free Library and the Athletic Association.

The regulations are as follows:—

1. Application for space upon the form provided must be filled up and returned to the Honorary Secretary, Alber Chandler, 1, King Street, Richmond, not later than Thursday, December 20th, 1888.

2. Photographs will be exhibited free of charge, and must be sent in mounted and framed (Oxford frames not admissible), and all exhibits delivered, carriage paid, on or before Saturday, December 29th, 1888, addressed to the Honorary Secretary, Photographic Exhibition, Castle Assembly Rooms, Richmond, Surrey, and bear, in a distinct manner, the name and address of the sender, together with the division and class. The committee reserve the right to refuse any exhibit, without stating any reason for so doing.

3. The committee will undertake to unpack, repack, and deliver exhibits to the carriers for return at the close of the Exhibition, and will, by engaging professional assistance, use the greatest care; but, at the same time, the committee will not hold themselves responsible for any accident, damage, or loss that may occur.

4. All particulars must be written on the back of the exhibit, as well as on a separate label attached to the frame. No name, title, or other particulars allowed on the front, as such will appear in the catalogue, and under no circumstances will the exhibitor's name and address be permitted on the front of the frame, or mount, or picture entered for competition.

5. No exhibit shall be allowed to be removed during the exhibition.

6. In the Apparatus Division a charge of 10s. to each exhibitor will be made for a collection of apparatus, &c. Glass cases will be allowed. Table space will be provided at 6d. per square foot, with a minimum charge of 5s. No exhibitor will be allowed to transfer any portion of the space allotted to him, or to allow any other than his duly admitted exhibits to be placed thereon, without the consent of the committee. Orders

may be taken, but no articles will be allowed to be sold in the Exhibition.

7. Photographs coloured will not be admissible.

8. Reasonable care will be taken to protect exhibits, but the committee will not be responsible for any loss or damage arising from fire, accident, or any other cause. The committee will, however, reasonably insure against fire the whole contents of the Exhibition.

9. The non-transferable admission ticket will be supplied to each exhibitor, and, in the apparatus division, to an attendant where necessary, which will pass the holder in the Exhibition without payment on each day of the Exhibition.

10. No chemicals of a dangerous or explosive nature shall, under any circumstances, be exhibited.

11. All who become exhibitors signify by so doing their compliance with the whole of these rules, regulations, and conditions, and with such other regulations as the committee may think it necessary to enforce.

12. Awards will be made in each class, provided the judges deem any exhibit or exhibits of sufficient merit. From the decision of the judges there shall be no appeal.

13. All correspondence and enquiries to be addressed to the Hon. Secretary of the Photographic Exhibition, Richmond, Surrey.

The following medals are placed at the disposal of the Judges.

**DIVISION A.—Open to all Exhibitors (Professional and Amateurs).—Class 1:** For Landscape or Seascape, or series of same—One silver, one bronze. **Class 2:** For Portrait or series of same—One silver, one bronze. **Class 3:** For Figure Subject or interior with figures, or series of same—One silver, one bronze. **Class 4:** For Architecture, Interior and Exterior, or series of same—One silver, one bronze. **Class 5:** For the best series of Lantern Transparencies—One silver, one bronze. **Class 6:** Stereoscopic Photography; Stereoscopic Slides (Paper or Glass)—One silver. **Class 7:** For the Best Transparency, not under half-plate—One bronze, presented by Messrs. Morgan and Kidd. **Class 8:** For the Best Enlargement on Messrs. Morgan and Kidd's Opals or Paper, any size—One silver, one bronze, presented by Messrs. Samuel Fry and Co., Limited, London and Kingston. **Class 9:** For the best Picture (Landscape or Figure) from a Negative upon Fry's Plates (Kingston Special, Kingston Slow, or 60 Times)—Silver medal. **Class 10:** For the best Slide or Set of Slides made upon Fry's Lantern Plates—Silver medal, presented by The London Stereoscopic and Photographic Co., Limited. **Class 11:** For the best Photographs taken with the London Stereoscopic Company's Apparatus—One silver, one bronze.

**DIVISION B.—Open to Amateurs Only.—Class 12:** For Landscape or Seascape, or series of same, irrespective of size—One silver, one bronze. **Class 13:** For Landscape or Seascape, or series from half-plate or under—One silver, one bronze. **Class 14:** For Portrait, or series of same—One silver, one bronze. **Class 15:** For Figure Subject, or Interior, with figures, or series of same—One silver, one bronze. **Class 16:** For Architecture, Interior and Exterior, or series of same—One silver, one bronze. **Class 17:** For the best Instantaneous Landscape or Seascape, or series of same—One silver, one bronze. **Class 18:** For the best series of Lantern Transparencies—One silver, one bronze. **Class**



19: For the best Collection of Slides of Microscopic Photography—Bronze medal. Class 20: For the Best Picture, half-plate or under (limited to Residents in Richmond, and within a distance of three miles therefrom)—Bronze medal (presented by the Proprietors of the *Amateur Photographer*). Class 21: For the Best Photograph in the Exhibition, irrespective of subject or size (the photograph must be the work of an amateur exposure, development, printing, and toning)—One silver, one bronze.

Photographs must not be entered in Divisions A and B to which prizes or medals have been awarded at other exhibitions.

CHAMPION PRIZES.—(In these classes photographs only which have taken prizes or medals at other exhibitions will be eligible for competition).—*Open to all Exhibitors*.—Class 22: For the Best Photographs, or series of same, in the exhibition—One silver-gilt, one silver, one bronze. *Open to Amateurs only*.—Class 23: For the Best Photographs, or series of same, in the exhibition—One silver-gilt, one silver, one bronze.

In the adjudication, special regard will be taken of artistic qualities, and preference will be given to prints from untouched negatives.

DIVISION C.—*Apparatus and Appliances*.—Two silver and two bronze medals will be placed at the disposal of the judges for the best collect on of photographic apparatus, or for any appliance of special merit.

Of the other exhibitions we may refer to one announced to take place at the Crystal Palace during March, 1889, which, to judge from the preliminary circular, will be too much of a commercial speculation to be thoroughly representative.

What is styled a "champion" exhibition is proposed for holding early in the year (to open January 8th) at 148, New Bond Street. Only works by those who have taken awards during the past ten years are to be shown. Requests for particulars should be addressed to the secretary at the above address.

## LIGHTING IN THE PHOTOGRAPHIC STUDIO.

BY C. P. I. DUCHOCHOIS.\*

THE art of lighting is generally neglected by photographers. The pose attracts all their attention. They pose the sitter at one end of the studio, regulate the light for that particular place, and, whatever be the character, the features of the sitter, it is invariably lighted in the same manner, or, in other words, by the light arranged once for all.

This a great error. The pose and the lighting are closely allied to each other; one gives value to the other; both are subject to the same rules.

A portrait is composed according to the individuality of the person to be represented—that is to say, his character—which is reflected by the features, the expression of the face, his age, condition, and profession. The attitude should be repose, simple; the face, the subject, and everything else related to it. The lines must be varied, well balanced; nothing in the picture should divert the eyes of the observer from the principal subject and destroy the unity; but they should be forced, so to speak, to unconsciously return to it.

If we apply this first rule to the lighting, we see at once that the portrait of a child, that of a young woman, and a man cannot be lighted in the same manner, nor every child, woman, and man treated alike to preserve their individuality.

A child, for example, should be brightly lighted with opposition of well graduated shadows to render his delicate, rosy face.

The portrait of a woman can be treated somewhat in the same manner to impart a calm, pleasing, and youthful appearance to the picture.

For a man, the opposition of light and shade should be more marked, to give firmness to his features.

An old savant, a man of mark with characteristic features, may be lighted *à la Rembrandt*: not the Rembrandt of the photographer, which consists in placing the sitter nearly profile, and the broad side of the face all in the shadow—a manner Rembrandt never used in portraits—but by large effects of light contrasted by dark shadows, the small side of the face in the shade, and the light playing around the sitter to give relief to the figure.

The rules and examples of lighting which will be given in these papers should be studied by analyzing the works of the great painters in the originals, if possible, or in good engravings, in

order not to be misled, and to produce just such effects; for, by an injudicious arrangement of lights and darks one may entirely alter the beauty of the model, or exaggerate the defects of its features, giving hardness to a pretty, smiling face, an undeveloped, insipid appearance to a round face already devoid of character, softness to energetic features, &c.; and thus destroy the characteristics and, therefore, the resemblance, which does not merely consist in exactly reproducing the lines, the form of the head, but also its expression and originality.

## II.

There are two modes of lighting a portrait, and, indeed, any picture.

The first one, which consists in distributing the light in masses by placing the whole subject in the light, is not devoid of grandeur. It has been and is still employed by artists, but the lights should be relieved by half-dark and dark shadows to give vigour and solidity to the whole, otherwise the picture becomes greyish, monstrous, without character.

The other manner is personified by the great master in *chiaroscuro*\* whose works are for the artist and the student an inexhaustible source of study. "The portraits of Rembrandt," says Mr. Charles Blanc, "induce to think, because they think themselves. Not only are they marvels of *chiaroscuro*, of touch and *modelé*, but the nationality of the man, his condition, his temper, his moral physiognomy, all is at once observed. Statesmen, physicians, burgomasters, savants, every one of the models of Rembrandt are characterised first by the adjustment and the accessories, of which not one is not useful; then the soul becomes visible in their features; the habits of the mind, the most intimate sentiments betray themselves by the unexplainable expression of regard—they look at you—and it is there specially that his portraits are living. The interior flame which lightens the eyes renders them more luminous still than the ray of light of which the master has made a pencil. Rembrandt represents life by the thought, and the personages of his paintings can say with the philosopher, 'Je pense, donc je suis.'"

The characteristic manner of this celebrated artist, which produces those bold and dark effects of light, in his paintings and engravings, and gives so much force to the scene he represents, is simple; a beam of light falls on the principal subject, and being diffused or reflected, as in nature, illuminates the secondary subjects, then melts into deep shadows, thus producing strong contrasts of lights and darks without harshness, whilst variety and balance are obtained by abrupt transitions, giving stability to the whole.

As it has been observed by eminent critics, this manner often costs too much, the rest of the picture being sacrificed to the principal subject, and to the brightness of effects. Those who have tried to imitate the master did not always keep within reasonable bounds. Photographers, if we except Adam Salomon and a few others, have exaggerated it to the grotesque, not knowing either the principles of *chiaroscuro*, or the manner of regulating the light in a photographic studio.

As examples of the manner of Rembrandt, study the well-known Dr. Faustus, "Christ Restoring the Daughter of Jairus," "Samson Menacing his Father-in-Law," better known in Germany as "The Prisoner," the portrait in the gallery of Brussels, that of an old gentleman in the gallery of Dresden (a jewel), the celebrated "Night Watch," &c.

Here we cannot refrain from calling attention to the "Descent from the Cross," by the King of Antwerp, an admirable example of composition, both in grouping and in lighting. All the personages of that sublime scene, the holy women, the apostles, concur to the same action, and all the lines so well supported, as rays of light radiate from the Saviour, who is broadly lighted and relieved by a white sheet, whilst the other actors are in a secondary light, melting into shadows, to which half-tones give transparency.

(To be continued.)

## THE EVOLUTION OF THE CERES.

BY JULIUS F. SACHSE.†

WITHIN late years many remarkable discoveries have been made of value to the arts and sciences, by the aid and use of the camera. Some of these discoveries were accidental; others again were arrived at only after a long series of experiments.

\* *Chiaroscuro* (or light-dark) is the art of combining and distributing the lights and shades to produce effect, depth, relief, and colour in a picture.

† From the *American Journal of Photography*.



Notable among the latter are the photographs of animal locomotion, and others, which so completely revolutionize many of the old theories and ideas which had held sway for centuries.

One of the latest applications and uses of the camera has been the successful attempt made to show visibly the growth and development of plant life, and in the experiments hereafter described it will be seen that marked growth, expansion, or development can be shown on the sensitive plate in an almost incredibly short space of time.

These experiments came about in the following manner. Several years ago the attention of the writer was called to the blooming of the ordinary night-blooming cactus, and the development of the bud and flower; this caused a desire for further and more thorough information on the subject. For this purpose a variety of the cactus family, which at that time was ready to flower, was obtained, and the subsequent development and unfolding of the bud into a full-blown flower carefully observed and studied.

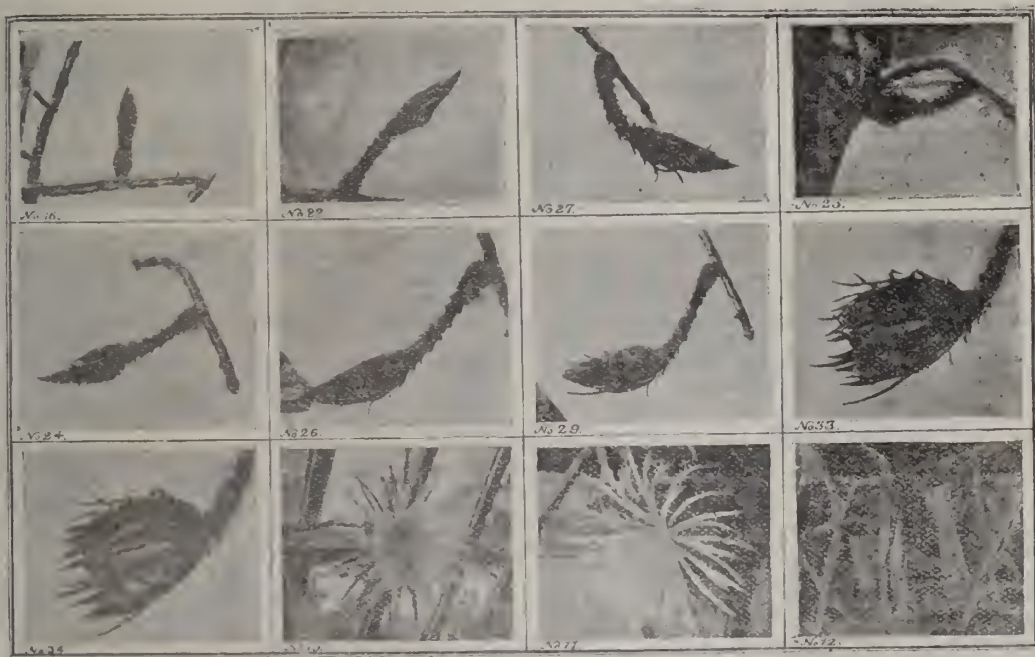
One of the most wonderful phenomena in nature, is how the vital force is stored in plants; how for months the plant lies dormant, without giving forth any sign of life or activity; yet when the time comes, the development of the bud, leaf, or flower, as the case may be, proceeds with certainty and rapidity. This

fact is, perhaps, more beautifully instanced in some of the "cactacea" than any other genus of plant life.

When this hidden energy and life is stored or what force or spark loosens the bonds, and sets the mechanism of the plant in motion, and causes the collapse from the moment when the zenith is reached, or the mysterious power is expended, is as yet an unsolved problem.

Whether this vital force, which so wonderfully causes the rapid development of the bud, with the accompanying straining and tremor of the fibres, from its base to the very point—action which is equalled only by the nervous twitchings of the animal organism—together with the expansion and increase of the cellular tissue of the plant, is the result of some chemical agents or properties, stored somewhere within the cellular system of the hard, dry, and often shrunken stem, or is absorbed from the dry, sandy soil, by the scanty rootlets of the plant, and, if so, whether it is by the aid or action of light, air, heat, or electricity that the unseen mechanism of the plant is set in motion, no one has yet been able to discover.

Arguments have been set forth tending to show that the length of all life in the universe was regulated by the rapidity of the growth of the subject—the quicker the development, the shorter the existence. Many are the theories which have



The Evolution of the Night-Blooming Cereus, Photographed by the Magnesium Flash Light.

been advanced on this and kindred subjects, but all without arriving at any definite conclusion.

The study of these marvellous functions of the plant organism stimulated the desire for further investigation, and led to the determination—if a similar opportunity should offer in the future—to make a series of measurements, and capture, if possible, on the sensitive gelatine plate in the camera, the successive stages of development and growth of this remarkable member of the plant kingdom.

In May of the present year two specimens of the *Cereus MacDonaldii* (Hook) coming in bud were available for experimental purposes, the first a young vigorous plant, showing indications of three buds, the other an older plant with two buds. It may not be amiss here to describe the plant selected.

The plant was discovered by General MacDonald in the wilds of Honduras, during the later "forties" of the present century; cuttings of the plant were sent by him to England, and named in honour of his wife.

The cuttings sent to the Kew Gardens rooted and flourished, and in 1851, during the great exhibition in London, bloomed

for the first time in Europe, the flower, from its size and beauty, attracting much attention and admiration from all who had the good fortune to witness the expanding of the petals.

Linnaeus, called the father of botany, knew but comparatively few of the plants known to us as the cereus; it was Haworth who first considered the distinctive characteristics by which they varied from the cactus variety important enough to branch them off and group them in a new and separate variety, viz., "The Genus Cereus."

The name itself is derived from the Latin, and denotes a wax taper (*Wachsfackel Wachskerze*), and was selected with reference to the use of the porous stalk of some varieties of this plant family by the Indians, by whom they were soaked in wax, gums, or other inflammable substances, and used as torches; in German they are called Fackeldistel or Kerzen-Cactus.

The plant itself is rather unattractive. The main stem, about the thickness of a man's thumb, sends out rambling, far-reaching, climbing limbs or branches. These are about the thickness of a little finger, five to seven cornered, almost round with dull, irregular edges, having, at irregular intervals, small rough knots



or protuberances, covered with bunches of fine prickles or horns; the colour of the matured growth is a dark, dull green. The importance of the plant, which unfortunately is a sky bloomer, consists wholly in the flower, which, when fully developed, is about fourteen inches in diameter, and appears during the month of June.

The development of the bud at first is very slow, being merely a small protuberance on the stem about the size of a pea. After a certain period the bud becomes in size and appearance like a hazel-nut. The development is then exceedingly rapid, as will be shown by the accompanying plates; the total length of the bud and stem, just before the final expansion, is about equal to the diameter of the full-blown flower.

The base of the Perigou tube or stem (*Perigon rovre*) is of bulbous shape, the tube proper, cylindrical, of a brown-green colour, the outer sepals orange-yellow; inner sepals, yellow, all curved backward; the whole form of the flower being liliaceous (*lilienformig*); petals, white, spatulate-shaped (*spatelformig*), the numerous stamens about seven inches long, recurved with sulphur-coloured yellow anthers; pistil, white, truncated, and extended beyond the stamens, with stigma radiating in ten or twelve directions, the extreme points being a very light yellow. For the better illustration we will designate the plant with three buds as "No. A," the other one "B," the buds respectively as I., II., III., IV., V.

As soon as it was found that the two plants above mentioned were available, preparations were at once made, as well as the limited photographic resources and knowledge of the operator would permit, to make the exposures at intervals of fifteen minutes, as soon as the development of the bud was fairly under way.

It may be as well to state at this point, that in these exposures no special care was taken for the purpose of making an artistic picture; the only object in view being to obtain a set of progressive plates of the gradual evolution of the bud into a flower.

The accompanying illustration of this article is a reduction of twelve of the negatives hereafter described. These were selected merely with the view of giving a general comprehensive idea of the results obtained.

The complete set of thirty-six negatives has been printed and mounted; lantern slides of the series have also been prepared, for the purpose of further comparison. The numbers given in the text refer to this complete set of pictures.

(To be continued.)

## DESIGN.

BY WALTER CRANE.\*

ART, like the parti-coloured shield of the fable, has two sides, or two fields, which—to maintain our heraldic simile—are constantly counter-changed one upon the other in the evolution of design.

These may be broadly distinguished as—

(I) Aspect.

(II) Adaptation.

The first comprehending what we call pictorial work, with the impression of the superficial aspects of life and nature as its chief aims. The second comprehending the province of the designer, whose object is rather to suggest than to imitate; or to express and relate by careful selection of the more permanent and typical characteristics of life and nature, or of linear forms derived from these, certain ideas of harmony and relation, or of poetic thought and fancy. The object of the designer being, in short, to ornament, his aim is rather ideal beauty than literal fact.

Since the times of the unity of the arts and crafts in architecture—since their differentiation—these main distinctions have become more and more prominent, until we have reached a period of development in which the very widest divergence of conception, method, and aim exist between one form of art and another, both in principle and in practice.

While on the one hand we have the pictorial artist striving with photographic impartiality and fidelity to record the superficial facts, phases, and characters of nature in their most unstudied and accidental conditions, with as much force but as little conscious selection and combination as possible; on the other we have the ornamental designer dealing with purely abstract qualities of line and form, and his work strictly governed by geometric plan.

Now an easel picture, or any pictorial rendering of nature, is supposed to be complete in itself. It does not necessarily concern itself with its surroundings; and even its frame—the last relic of the connection of painting with architecture—is often only an arbitrary boundary, not to define its decorative limits, but to isolate it more completely. We might call pictorial art of this kind unrelated art; its form dependent only on the caprice and individual impressions of the painter. Anything in the nature of decorative design, on the other hand, must be consistent in relation and harmony not only with itself, but to its surrounding conditions. The most careful selection must be exercised in the choice of form; the utmost consideration given to plan and play of counter-balancing line. The result may be a picture, but it must also be a pattern.

A poet, while using the common tongue and forms of speech, casts them in certain rhythmical shapes, and in seeking the highest form of literary expression, imposes certain restraints and exercises the strictest selection.

Design, too, is a language full of richness and variety, and in the various forms of its application through the whole range of the handicrafts, by the very necessity of its adaptation to them, finds new methods for the expression of beauty, harmony, fitness, unity in variety, variety in unity—whatever we like to call it.

Now, under our head, Adaptation.

There are at least three main points of view from which we may regard design. Firstly, design in its least applied sense, as connected solely with the embodiment of ideas, and expressed by beautiful drawing alone—depending on qualities and conditions of line, and colour, and value—design, in fact, on the pictorial side, less dependent on material, although always influenced by it, as in the hands of different individuals different qualities are brought out. For instance, the characters and quality of a drawing with a pen and ink will differ from one in pencil, though by the same artist; while in the designs of different masters of different ages and countries, the greatest contrasts in spirit and methods of expression are found even when the material is the same, as for instance, between a drawing of Albert Durer and one by John Flaxman, whether rendered by pen or graver.

So from the very simplest methods of the draughtsman, to the utmost complexities of the painter, design must be influenced by the characteristics and facilities of the materials with which the artist works, and must constantly vary in intellectual and poetic expression according to individual use and touch.

The second sense in which we may understand design is as constructive drawing; as the plan, working drawing, or pattern to be translated or expressed in other materials, and adapted to certain spaces or objects, and as deriving, therefore, its chief value and interest from the success with which it is adapted to such materials and such spaces or objects, over and above its own intrinsic qualities, and the measure of its beauty and invention. The third conception of design is as it may be expressed by means of the characteristic qualities of the different materials themselves, and as the natural outcome of those qualities with which it is inseparably bound as thought with language. This is when designer and draftsman are one, and think and work in the material of their thought, as it follows the ductibility of the metal, the crispness of the wood, the pliability of the leather, the plasticity of the clay, or whatever may be the vehicle of expression.

It is chiefly of design in the sense of constructive drawing as understood in the second of my three divisions that I propose to deal to-night; though, necessarily (since there is no hard and fast line between them) with occasional excursions into the first and third.

If it may seem that in this matter of design I am drawing mostly on my own experience and my own illustrations, it is because I think it may be more useful to give the results of a definite personal practice as far as it goes, than to rely on theories and assumption about the work of others which could not possibly have the same certitude.

In these literal and photographic days, one of the first questions which meets the designer is the degree of naturalism which is within his scope and purpose.

There are endless ways of looking at nature. We may use our eyes alone, or we may use all our faculties and not find them too much. It is certain that what we feel and know enters as largely into art as what we see.

Now the designer may make as many careful studies from

\* A Lecture delivered before the Arts and Crafts Exhibition Society.



nature as the painter, but he will look for different facts, and express them in a different kind of shorthand.

Take an oak tree, for example. The pictorial sketchers might represent it somewhat in this way (illustration)—his method of saying, "This is an oak tree."

But the designer, while he might also make a sketch from this modern landscape point of view, could not stop here if he wanted to make a decoration of it. He would have to formalize it, or systematize it, to make a pattern of it; in short, to make it speak clearly and intelligibly in decoration. He would go to work somewhat in this way (illustration). This would be his manner of saying, "This is an oak tree."

Now the first or pictorial method of representation involves quite as distinct a convention, in its own way, as the second or decorative method. In the first, a species of shorthand is employed for the statement of certain external facts, uncontrolled by any ornamental intention or decorative purpose. The second emphasizes certain facts, but makes external appearances subservient to the decorative purpose. In making a book illustration, for instance, the artist may think exclusively of the scene he has to represent without reference to what may be called the architecture of the printed page, or the mechanical conditions of its existence. The result, however admirable and brilliant as an independent work, remains unsuitable to its purpose and conditions. Or he may, availing himself of these conditions, produce not only an illustration, but also a decorative design fitted to the mechanical conditions of the press, and adding to the beauty of the book—a point brought home by Mr. Emery Walker in his admirable lecture on letter-press printing.

The designer would, moreover, have in view some particular space or shape he wanted to fill with his oak tree, and so he would control its contours with an imaginary line, curved or angular, as might best adapt itself to his decorative purpose, and the method and object of the work.

While he might rest content with his round-headed oak tree as a device complete in itself, in adapting it on a square principle to fill a panel he might find it desirable to balance the design, and add to the interest by the addition of stags beneath (illustration); and by repeating the device obtain a motive for a diaper pattern, and by printing it on wall paper or cotton bring a whole deer park within the modest domain of the landless citizen.

Supposing we plucked a field daisy and drew its portrait, somewhat like this (illustration), we should feel it made a somewhat meagre device for a panel; but if we proceeded to make a treatment of it, thus (illustration), we should fill our space and produce a design.

Here, again, we build upon a linear plan geometric in its origin, and we follow the alternate system in the arrangement of the leaves and flower.

These geometric plans which govern all ornament are the very alphabet of design, and, like all alphabets, have played a very important part in its history.

The earliest forms of ornament were purely linear and geometric. Borders were constructed of a series of horizontal or perpendicular lines and strokes, or by the simple repetition of geometric forms such as the square and circle, as in the examples from the gate of Mykenæ, as well as in the patterns of all primitive peoples.

From the square and circle, as from parental roots, a whole troop of patterns develop. For instance. We get here certain leading types of controlling systems or plans of pattern and design—square, circle, spiral, scroll, scale, radiating, or fan, which form not only the plans and bases in design, but themselves in combination forming patterns, are what might be called decorative units. Governing these, again, we have other controlling systems or principles in design, such as the symmetric (example), the alternative (example).

Under such systems of structure, or their varieties, all designs might be classed. Perhaps the most universally valuable is the radiating principle—the spring of a series of lines from a common centre—or which might be termed "local self-government" in design.



We may find this principle controlling the simplest repeating border up to the highly complex figure design. Take the drapery of a figure, for instance. We may have a vast number of different centres, and our lines may diverge sharply or gradually from their common centre, but so long as these invisible centres are felt, the design gains a certain vitality and organic connection throughout (illustration).

And where we see the principle most emphatically expressed,

as in the scallop shell, and the wing of a bird, it conveys a sense of both organic vigour and yet lightness, combining, in fact, the minimum of weight with the maximum of strength.

The human figure contains in its plan, and the principles of its structure, all the most important principles of decorative construction, besides being itself the most inspiring source and chief factor and most expressive unit in design.

Its outline consists of a series of counter-balancing curves; the outlines of the limbs express the same principle, and emphasise the alternate system in their counteracting curves.

Never thus—  
but thus—

We get the radiating and combining principle in the ribs, and in the set of the fingers or the toes.

The figure itself, built on the firm and symmetrical framework of the bones, yet expresses in its contours a series of counter-balancing curves. Its beauty depends upon its construction. The human figure, too, being the most adaptable of all forms, lends itself to treatment in filling spaces—which brings us to another important principle in designing.

(Illustrations of the adaptation of the figure to spaces.)

Connected with this question of filling spaces, the designer has another important consideration before him in the determination of his mass or silhouette. This in itself may be considered as a distinct and most important part of designing, as, apart from plan and line, in contriving the masses of a design, any amount of ingenuity and invention may be spent. In adapting a figure to fill a particular proportioned space—in decoration, for instance—one would think of it as a mass capable of infinite variation either as a dark upon a light ground, or light upon a dark ground, and requiring modification accordingly. If we were to place a figure on the principle of even symmetrical balance in a panel thus (illustration), it would be felt to be rather a dull affair. We should try to vary it as much as possible; we should think of an idea, a motive for the action of our figure, and might get a result something like this (illustration). Even then our space would want more filling, and so we shall be led on to enrich it with drapery and other details.

The boundaries of the silhouette will be the measure of the interest of our outline. The determination of the quality of this line, and the degree of its emphasis, is another very important consideration with the designer, as the expressiveness of his whole design will largely depend upon it.

This is, of course, in the case of applied designs, practically determined by the material in which the design is to be rendered. The lead lines necessary in building a stained-glass window, for instance, are taken account of in the cartoon, and, so far from being disguised, at once become important decorative elements of the highest value in determining the chief masses of the design. (*Vide* instances in the Arts and Crafts' Exhibition.) There is, in fact, no sort of flat design in decoration to which outline is not essential. It may be as fine as an etching needle or pen can make it, or substantially built up in a row of solid tesserae in mosaic, but is always under the necessity of expressing its purpose according to its conditions: apart from modelled work in relief, where, though still controlled by lines, it is rather the construction lines of the plan than any actual outline, the decorator's effect depending on the pleasant and varied, though ideal, opposition of light and shade.

(To be continued.)

## HELIOCHROMY.

BY FRED. E. IVES.\*

IN my lecture on "Some Recent Advances in Photography," delivered before this Institute in February last, I briefly described and illustrated a method devised by me for producing photographs in natural colours. I now have illustrations of the process, comprising a sufficient variety of subjects to more fully demonstrate its capabilities and value.

I claimed for this process that, unlike any similar process yet suggested, it was based upon a true conception of the nature of light and colour vision, and was a strictly scientific method of accomplishing the object sought after—which is to produce, by an automatic process, pictures which counterfeit not only the light and shade, but also the colours of all objects which may be photographed.

I explained how some others who experimented in this direc-

\* A Communication to the Franklin Institute.



tion failed because they built upon the false theory that there are only three primary colours of light. I recognized the fact that there are, strictly speaking, thousands of primary colours, but also that all colours, whether simple or compound, may be counterfeited to the eye by means of three type colours, separate and mixed, in different proportions. I assumed that we might counterfeit all the colours of nature in a photographic picture, by making each ray of simple colour select automatically, in the operation of the picture-making process, such a type colour or mixture of type colours as will counterfeit it to the eye, and showed how this can be accomplished by means of photographic plates made sensitive to all colours, and exposed through compound light filters, which are suitably adjusted by experiment upon the spectrum itself.

For the mechanism of the process and some demonstrations, I refer to my original communication, which appeared in the *Journal of the Institute* in May. I believe the problem had never before been stated with reference to the possibility and necessity of representing most of the primary colours by colour mixtures, which, though not the same, produce the same colour-sensation.

In order to make clear the fact that my plan of operation is in accordance with what is now recognized as the true theory of the nature of light and colour-sensation, I make the following quotations from a recently published text-book on "Colour," by A. H. Church, M.A., London.

"Young's theory does not assume the existence of three primary colours, but of three primary colour-sensations; a very important distinction.

"Every ray of differing refrangibility in the visible part of the spectrum is in one sense a primary colour, for it is simple, and excites a definite sensation. But there are many reasons, mainly connected with the structure and functions of the eye, which have led to the selection of certain coloured lights—generally three in number—as yielding primary colour-sensations. This primariness is then not objective, but subjective in respect of human vision.

"Young's theory of colour-perception amounts essentially to this, that in each elementary part of the retina of the eye there is, at least, one set of three different nerve fibrils, each of the three fibrils of a set being especially adapted for the production of its own specific colour-sensation, yet in a less degree of the two others. Thus the receptive structure of the retina, as a whole, may be said to consist of an immense number of nerve fibrils of three orders, what we may call red fibrils, being particularly acted upon by such long light waves as those in the red, but being also stimulated in a minor degree by the shorter waves in the green, and still less by those in the blue, the green fibrils will respond most actively to green waves, and in some measure, also, to red and to blue waves; while the blue fibrils will be most excited by the blue rays, though not uninfluenced by green and even by red rays.\* It follows that when all three kinds of nerve fibrils are equally and simultaneously affected, the complex sensation of white light alone is produced.

"Coloured lights may be, and often are, compound, sometimes consisting of two, and often of many more differently-coloured elements, although the eye recognizes but a single colour in the complex ray. A striking instance is afforded by yellow. There is an elementary yellow in the solar spectrum lying on the green or more refrangible side of the line D. By no contrivance can we optically decompose this spectral yellow, to which belongs a definite wave-length. But there are many compound yellow lights—lights which give us, as the sum of the simultaneous visual impression of their several components, a sensation of yellow not to be distinguished by the brain from the simple yellow of the spectrum. Such a compound yellow may be formed by throwing on the same portion of a screen a part of the red light and a part of the green light of a pure spectrum. Similarly there is a pure and simple blue in the spectrum, but a blue indistinguishable from this in hue may be obtained by mingling green and violet light.

Now, although I worked out my process on the simple plan of making each primary ray of colour select from three type colours to counterfeit it—or, in other words, to produce the same colour sensation—it becomes evident that in accomplishing

this I have produced one negative, by the action of solar rays, very nearly in proportion as they excite the "red nerve fibrils" of the eye, another in proportion as they excite the green fibrils, and another in proportion as they excite the "blue fibrils."\* And in recomposing the picture by means of lantern positives and coloured lights, I have employed those rays which excite most powerfully the corresponding colour sensations.

Red, green, and blue being the primary colour-sensations, those colours of light are of course used in recomposing the heliochromic picture upon the screen; but when pigments are used instead of coloured lights, owing to the fact that their combination adds shade to shade instead of light to light, the complementary colours (something like Prussian blue, magenta-red, and yellow) are required. In one respect, the diagram in my original communication seemed wrong to some, who, not noticing my distinction between the two methods of reproduction, failed to observe that pigment reproduction colours were meant to be indicated, and that therefore it would be the deepest shadows of the corresponding negatives which represent those portions of the spectrum. I have to confess that the diagram should have been made to allow these facts by itself; but it was at least made evident that by my plan of operation, the relative degree of representation of any part of the spectrum in any one negative could be regulated at will to agree with the character of the pigment laid down by that negative.

The question has been asked whether the action of the primitive rays, in selecting type colours to counterfeit them, would secure also the correct representation of mixed colours. I conclude that it will only be necessary, in order to secure this result, to employ such type colours as represent the primary colour sensations.

Admitting the theoretical soundness of my mode of procedure, which I believe I have fairly demonstrated, there remains only the question of practicability and commercial value to be considered. The process is practicable, if the same operations, repeated in the same manner, can be relied upon to produce pictures which counterfeit the light and shade and colour of all objects. Three subjects which I shall show to-night, a delicate oil-painting, a brilliant Prang chromo, and a beautiful sea-shell, were made with the same light, same camera, same preparation of sensitive plates, same set of colour screens, same relative exposures, and same development. They show a very great variety of colours, mostly compound in the painting and chromo, but pure spectrum colours in the sea-shell; yet the colours of all are alike faithfully counterfeited to the eye. Although there should be no question of the fact, I will here state that these finished results have been obtained without any retouching or artificial manipulation whatever.

#### PHOTOGRAPHY OF THE LEAST REFRANGIBLE PORTION OF THE SOLAR SPECTRUM.

BY J. C. B. BURBANK.

It has been stated by eminent authorities that the process of staining dry plates with various dyes is not applicable to the photography of the invisible rays beyond the red of the solar spectrum. To test this question I have undertaken a series of experiments with the dye cyanine. This dye has of late come into considerable prominence in photography, owing to its orthochromatic effect when mixed with other dyes, such as chinoline-red, azaline, erythrosine, and eosine.

It was discovered by Greville Williams, an Englishman, in 1861, but did not come into much prominence until the year 1884, when its usefulness as a sensitizer became more apparent. The dye is easily decomposed by light, and even in the dark both its solution and the plates coated with it are apt to become decomposed, if kept for any length of time. Alone, it has been found very useful to sensitize plates for the orange and red portions of the spectrum. No experiments have, to my knowledge, been made upon the effect of heat-rays upon cyanine plates.

The direct action of absorbents in the infra-red has not hitherto, been tried with any success; moreover, it has been

\* "Helmholtz remarks, that the choice of these particular colours is somewhat arbitrary, and that any three could be chosen, which, when mixed together, would furnish white light. If, however, the end and middle colours of the spectrum (red, violet, and green) are not selected, then one of the three must have two maxima, one in the red and the other in the violet; which is a more complicated, but not an impossible supposition."

\* In "Modern Chromatics" (Rood) p. 114, will be found a diagram showing the supposed action of the spectrum upon the different sets of nerve fibrils, according to Young's theory. It has, however, been shown by actual measurement, that the curves of such a diagram should be shorter than was originally supposed, that the red fibrils are practically unaffected by blue light, and the blue fibrils practically unaffected by red light. A corrected diagram by Maxwell, which is reproduced on page 123 of the same book, very nearly corresponds to the distribution of intensity in some of my own sets of heliochromic negatives of the spectrum.



stated by so eminent an authority as Captain W. de W. Abney, that it was impossible to make plates sensitive to any rays below the A of the solar spectrum by means of the addition of dyes to a film. It is true, however, that Major Waterhouse has succeeded, by means of turmeric, in obtaining evidence of the existence of a few lines on the less refrangible side of A, but in all cases except one these were reversed.

The plates employed were made by the M. A. Seed Co. of sensitizer 22. The method used in staining the plates, and in the preparation of the dye, is substantially the same as that employed J. B. B. Wellington, and is as follows.

Fifteen grains of cyanine are gently heated (over a steam bath) for from thirty to forty minutes in combination with one ounce of chloral hydrate and four ounces of water. The whole mixture should now be stirred vigorously. While this operation is going on, 120 grains of sulphite of quinine are dissolved by heat in a few ounces of methylated spirit; if methylated spirit cannot be obtained, a solution of 90 per cent. alcohol and 10 per cent. wood spirits will answer perfectly well). One ounce of strong aqua-ammonia is now slowly added to the cyanine mixture above. Violent ebullition takes place immediately, chloroform being evolved and cyanine deposited in a soluble form on the sides of the vessel. The mixture is allowed to settle for a few minutes, and then the supernatant liquid is decanted off very slowly, care being taken not to detach any of the cyanine that formed on the sides.

To the remaining cyanine three or four ounces of methylated spirit are added to dissolve it; the quinine solution is then added; and to the whole more methylated spirit, until the whole mixture measures from eight to nine ounces. This solution constitutes the "stock" solution, and should be kept away from all light, as it is very apt to become decomposed.

All of the above operations should be conducted in as little light as possible. The following staining and drying processes should be conducted in absolute darkness.

To 30 ounces of water are added  $1\frac{1}{2}$  drachms of the cyanine stock solution; the graduate that contained the cyanine is now washed out,  $1\frac{1}{2}$  drachms of strong aqua-ammonia are added, and the whole mixture is stirred vigorously. Into this bath two or three plates, or half a dozen strips, can be dipped at once. They should be left there about four minutes; meanwhile, the tray containing the plates should be rocked continuously, so as to insure a uniform action of the dye.

This bath, after having been used once, should be thrown away, as the action of a second batch of plates would be weak and imperfect. The plates can now be drained, dried, and used. While developing, I was careful to exclude all light whatever, although I think it possible that the plates may be developed safely in a dark greenish-yellow light. The developer used was a pyro and potash developer of (generally) normal strength.

In the first experiments the spectrum was produced by a Rowland flat diffraction-grating, mounted on a spectrometer-circle. This grating contained 17,000 lines to the inch. The observing telescope of the spectroscopy was replaced by a camera and lens.

Certain photographs were also taken by means of a Rowland concave grating of 14,500 lines to the inch, and of 21 feet 6 inches radius of curvature. With this grating, the amount of light being less and the dispersion greater than in the former cases, the exposure had to be increased.

In all the experiments ruby-red glass screens were used in order to cut out all of the more refrangible part of the underlying spectrum. In some cases a weak solution of iodine in carbon disulphide was used with good effect.

No difficulty was found in photographing from the A line to wave-length 9,900, or to the limit assigned by Abney as the limit of the diffraction spectrum. None of the lines were reversed. A special study of the A group was made, photographs being taken at different seasons, in order to see if any changes in the remarkable group of lines constituting the A group could be noticed. No existing map represents this group correctly. Employing the second spectrum produced by a concave grating, 52 lines were observed between wave-lengths 7,100 and 8,000. In the same space Abney records only 24 lines. Between the head of A and the tail of A, the latter being the single line before the series of doublets begin, which is so characteristic of the A group, my photograph shows 17 lines. These photographs were taken in June between ten and one o'clock.

These results are of special interest when we consider that Abney has said in a Bakerian lecture, "As a result of these experiments I can confidently state that in no case did the addi-

tion of a dye cause any chemical effect to be produced by the rays below A of the solar spectrum, nor has Vogel claimed that they do."

It is interesting to note that Abney is led to believe that the photographic action which has been noticed hitherto, by the use of dyes as sensitizers, can be attributed to a certain action of nitrate of silver on organic matter. This effect is a bleaching one, and only the more fugitive dyes can produce it. We are led to conclude from Abney's paper that he believes that only a chemical effect produced in a specially prepared emulsion can be used to produce the infra-red rays. After many experiments he succeeded in producing such an emulsion. The colour of this verged upon the blue. Since the colour of plates stained with cyanine by the process I have described is also blue, there may be some physical significance in this resemblance.

My experiments show that a specially prepared emulsion is not necessary for the photography of the infra-red region. The chemical theory advanced by Abney, therefore, seems to need revision.—*From the American Journal of Photography.*

## SELECTIVE ABSORPTION OF METALS FOR ULTRA VIOLET LIGHT.

BY JOHN TROWBRIDGE AND W. C. SABINE.

THE question of the absorption of the ultra violet rays by metallic surfaces possesses considerable interest, both from a practical and a theoretical point of view. By the kindness of Professor Pickering, director of the Harvard University Observatory, we were provided with a number of metallic surfaces prepared by Professor Wright, of Yale College. These metallic surfaces were deposited upon glass by means of electricity. The surfaces were of gold, platinum, tellurium, palladium, copper, silver, and steel. A preliminary trial had shown us that a heliostat mirror of the same composition as that upon which the grating was ruled, did not absorb light of greater wave length than 2,900. We resolved, therefore, to compare other metals with speculum metal. Since our heliostat arrangement required two mirrors to direct the light upon the slit of the spectroscopy, we employed a speculum mirror for the movable mirror of the heliostat, and replaced the fixed mirrors by mirrors of metal, whose selective absorption we wished to compare with that of speculum metal. To our surprise the metallic mirrors of gold, copper, nickel, steel, silver, tellurium, and palladium, all reached the same limit as speculum metal.

Here was a complete experimental proof that colour in no way influences the selective absorption of metals for the ultra violet rays; for the copper mirror, which gave a strong yellow light by reflection, was capable of reflecting light of as short wave length as the brilliant white surface of polished silver. Although the metallic surfaces we employed were bright, slight differences in polish no doubt existed, and therefore we are not justified in placing much reliance upon the evidence presented by the intensity of the photographs of the solar spectrum obtained by light reflected into the spectroscopy by these various metallic surfaces. The photographs, however, can be classified according to intensity in order of numbers as follows, 1 indicating the greatest intensity:—1, steel; 2, gold; 3, platinum; 4, palladium; 5, silver; 6, tellurium; 7, copper.

It was evident from these experiments that selective absorption of metals is far less than the absorption exercised by the earth's atmosphere. We resolved, therefore, to employ the light of the electric spark between metallic terminals, in order to ascertain whether any limit of absorption could be reached.

For this purpose the light of the spark between copper terminals was reflected by means of a mirror of the metal, whose selective absorption we wished to examine, upon the slit of the spectroscopy. To protect the surface of the mirror from the effects of the spark, a thin plate of quartz was placed in front of it. It was found that the copper mirror showed no limits of selective absorption by reflection for wave lengths of light produced by burning copper at the limits of the copper spectrum, that is wave length of 2,100.

The photographic plate taken by this method showed all the lines that the plates showed which were taken by the direct light of the spark, unreflected and unabsorbed by any medium. The palladium mirror was substituted for the copper mirror, and also showed no limit of selective absorption above wave length 2,100.

We are led to conclude, therefore, that the metallic surface of the speculum metal upon which the lines are ruled which form



the diffraction grating does not fix by selective absorption the limit of metallic spectra at 1,800 to 2,000. This limit more likely resides in the materials forming the sensitive emulsions with which the sensitive plates are coated. We have found that a marked difference exists in different emulsions in regard to sensitiveness to ultra violet light. The various staining processes which enhance, to such a marked degree, the sensitiveness of photographic plates to wave lengths of greater length, do not seem to affect the limit of metallic spectra in the ultra violet. Thus plates stained with erythrosine which are extremely sensitive to yellow and green light, continue to give the same limit in the ultra violet after staining as they did before they were submitted to the staining process.—*From the Proceedings of the Franklin Institute.*

### Notes.

The changes which photography has undergone during the last quarter of century find their reflection in the aspects of certain thoroughfares. Regent Street still boasts of its photographers, but their number is sadly reduced; Baker Street is but a ghost of its former self; while a writer in the *Telegraph* this week, describing the shops of North London, does not even mention the photographers of the Upper Street, Islington, and Euston Road. At one time, no one could walk down these two thoroughfares without being struck with the hosts of photographic studios. It was a common thing to find in the Upper Street two men in business next door to each other, and both doing well; and in the Euston Road, half a dozen establishments side by side jostled each other. Indeed, the Euston Road was once described by a writer on London characteristics as being "bounded on the north by photographic showcases, and on the south by tombstones," and the description was not far from the truth. But, like that of Regent Street and Baker Street, the glory of both Upper Street and Euston Road has departed, and the fortunes which were once made there, are now among the traditions of photography.

Photography must now be added to the occupations which solace the hours of those who seek the retirement which the Catholic Church affords. It would not be at all surprising to find that the monks of the various orders were as skilful in the art of photography as their predecessors were in the art of illumination. A letter received at the last meeting of the French Photographic Society from the Saint-Pierre printing establishment at Solesmes says that the Benedictines of Solesmes are preparing to publish in 1889 a collection of—to use the convenient French term—*paleographie musicale*, consisting of photographic *facsimiles* of ancient manuscripts of liturgical chants. These *facsimiles*, printed at various epochs of the middle ages, will be accompanied by introductions and notes which fix the age of the manuscripts, and which will indicate the paleographic peculiarities. The collection cannot fail to be intensely interesting, and suggests that there must be priceless treasures locked up in the Continental monasteries which might well see the light of day through the medium of photographic reproduction.

Photography in Berlin must be more profitable than in London, or Frau Vogelsang must be of an extremely

sanguine disposition. This lady teaches other ladies how to photograph. She has a large studio where she instructs them, and a large house where she affords them board and lodging. The cost of instruction is £5 the month, that of board and lodging is not stated. All things considered, the most stupid pupils should pay the best, as no doubt they would partake of Frau Vogelsang's board and lodging the longest. Frau Vogelsang believes that many ladies who are unsuccessful as painters might make a very fair livelihood in photography. Naturally Frau Vogelsang would hold this opinion, or what inducement could she offer to ladies to come and lodge with her, and learn photography?

It is to be hoped, however, that no lady has the same notion so far as London is concerned. The year just at an end is universally conceded to have been one of the worst known for a very long time. It is not certain whether the cause is due to a dearth of customers, or a plethora of photographers; but the unhappy fact remains. One reason has been found in the enormous increase of amateurs. And it must be confessed that the ease with which anyone of ordinary intelligence can acquire a very respectable amount of skill, has affected the receipts of the professional man. Probably after the mania has passed the public will return to their allegiance, but in the meantime the poor photographer suffers. At any rate, it is pretty certain that any lady who took up photography as a means of livelihood would, at the present moment, run a great risk of failure.

The large views taken last summer by the well-known Alpine photographer, Vittorio Sella, of Mount Etna, from the sides of this mountain, show that he can deal as successfully with water and shipping (as shown in his view of the Bay of Catania, with Etna in the distance) as with ice, snow, and mountains. His picture of the crater, taken within a few yards of the yawning gulf, from which issue clouds of white smoke, is wonderfully soft, and gives an excellent idea to those who have never made the near acquaintance of a volcano.

*Science and Art* gives remarkable information: that Mr. J. J. Williamson, whose skill in copying works of art and in colouring photographs has been so largely availed of by the authorities of South Kensington Museum, has become temporarily insane. A testimony to Mr. Williamson's extraordinary skill was given the other day when an eminent authority, after examining one of these coloured photographs, expressed his belief that it was unwise to expose such precious relics in such a bright light. He thought he had before him the original relics!

In reference to South Kensington, it may be noted that there does not appear to be any class resembling the technical class attached to the *Ecoles des Arts Decoratifs*, which, says a writer in an article on the Paris technical schools and schools of art appearing in the journal we have just mentioned, stands in relation to the technological movement in France much the same as South Kensington does to the similar movement in England. This technical



class is held every Sunday morning, and, says the writer in question, its essentially technical character may be gathered from the fact that representatives from two of the largest photographic firms in Paris—viz., Hausseman and Nadar—were present. The *seance* was on outdoor subjects treated with small quarter-plate cameras, specimens of the latest improvements in apparatus being subsequently submitted by the representatives of the firms in question. This in England, we are afraid, would be considered dangerously approaching the “shop.”

## Reviews.

DIE BROMSILBER-GELATIN, IHRE BEREITUNG UND ANWENDUNG ZU PHOTOGRAPHISCHE AUFNAHMEN, ZU ABDRUCKEN UND ZU VERGROßERUNGEN. Von Paul E. Liesegang. (Sechste Auflage, Düsseldorf: Ed. Liesegang's Verlag, 1889).

THIS new edition of Dr. Liesegang's excellent manual of the gelatino-bromide process contains much new matter, brought up to the current time, so as to give it a special value to all who are interested in the subject.

PHOTOGRAPHISCHER ALMANACH UND KALENDER FÜR DAS JAHR 1889. (Düsseldorf: Ed. Liesegang's Verlag).

LIESEGANG'S photographic annual comes to hand loaded, as usual, with a large fund of condensed information. It contains two excellent portraits, one of Ed. L. Wilson, and another of Daguerre, and it gives due prominence to such subjects of current interest as orthochromatic photography and magnesium lighting.

Dr. Liesegang is to be congratulated on the excellence of his Photographic Almanac for 1889.

## HARDWICH ON THE LIME LIGHT.\*

THE large number of slides shown at the lantern demonstration of the Newcastle Photographic Association on December 3rd prevented me from saying anything with regard to the light. The “oxyether” was the process employed, as on previous occasions, but with Ives' porous saturator instead of Broughton's vapour tank. The working of the latter is perfect, but experience has shown that when it is badly made, or improperly used, an explosion may occur, whereas the experiments of the late Mr. Frederick Barber (whose loss is much to be deplored) seem to show that a dangerous explosion is not possible with Ives' saturator, however carelessly it may be handled. Mr. Barber purposely did almost everything which he ought not to have done, but the only result he could obtain was a crack like that of a small pistol, and a blowing off of the india-rubber tubes. This is a point of great importance now that gas bags are falling comparatively into disuse, and cylinders of compressed gas are taking their place.

In America they appear to use these cylinders without any regulator, and to turn on the gas by little and little with a proper key. This, however, is not a safe thing to do with oxyether, and I have heard of the flame being forced back into the porous saturator, and enough heat generated to burn a hole in the metal tubes of which it is composed. On the evening of December 3 we tried “Beard's new regulator,” and also “Clarkson's patent,” supplied by Messrs. Steward, of the Strand, London. Both answered the purpose sufficiently well, with a single lantern, and it remains to be proved by a longer experience which is less trouble to get out of order.

I have not seen any description in print of the small regulator sent to us by Mr. Beard, but it is quite different from the one we tried last season. Instead of a screw there are two “eccentrics” moved by a “lazy tongs” arrangement, and two or three springs of different degrees of tension are supplied, so that any amount of pressure can be obtained from twelve inches of water up to forty inches, according to the number of lights to be fed.

\* A communication to the Newcastle-on-Tyne Photographic Association.

The porous saturator sent to me by Messrs. Cutts and Sutton, of Sheffield, is a handsome piece of apparatus, of a horseshoe shape, consisting of two nickel-plated tubes lying side by side on an ebonised wooden stand. It weighs 6 lbs. 5 ounces in the scales, and when filled with ether and drained rather closely, gains 14½ ounces, equal to twenty fluid ounces of ether of .717, nearly.

A difficulty with this form of saturator is to get it absolutely ether-tight at the caps. Soap is recommended, but this I did not find to be sufficient. I therefore took off the barrels from the stand (to avoid twisting the bent connecting tube), and, holding one of them firmly in the hand, put a spanner on the nut and worked the cap gently backwards and forwards until the edge of the barrel had ground for itself a groove in the leaden washer. I then did the same with the second barrel, and had the satisfaction of finding that the joints were tight enough to admit of my leaving the instrument for several days, fully charged, without the smallest loss of weight. The proper course would be to ascertain whether the caps were tight before pouring in the ether. To do this you should close one of the taps and suck at the other; it ought to hold the tongue for at least half a minute. Unless you make the apparatus tight there will be an unpleasant smell of ether in the room.

I do not find the saturation as complete as with Broughton's tank, when the porous saturator is closely drained; but, nevertheless, it will answer very well for a two hours' exhibition with a single lantern, and the amount of ether passing through the H-tap will be nearly or quite as great at the end of the lecture as at the beginning. If you want more ether vapour, to prevent “passing back” when the flame is extinguished, there are two ways of obtaining it. First, by adding a third barrel to the saturator, as some of the American firms do; and second, by leaving a little liquid ether in excess when you fill it, as Mr. Ives himself advises. I find with the saturator sent to me by Messrs. Sutton I can put in six or eight fluid ounces extra, and incline the barrels downwards at an angle of nearly 45° without any running out at the taps. Please to notice, however, that if you do this you incur the responsibility of closely watching the saturator during the lecture; because if it happened to be on the table, and the oxygen gas on the ground, the ether might run back into the bag if the barrels were tilted too much downwards.

I have been in correspondence with Messrs. Alfred White and Sons, of Castle Street, Saffron Hill, London, E.C., who are large manufacturers, as to the best quality of methylated ether to use, and I find that they keep four kinds in stock—ether of .750, .730, .720, and anæsthetic methylated ether of .717. The last is by far the best, and it is so dry that it will not leave any water behind in the flannels. Those who live in the north of England, and find it too far to send to London, can obtain an excellent quality of ether of Messrs. Mawson and Swan, Newcastle-on-Tyne. The specific gravity is about the same as that already quoted—viz., .715 to .717 at 60° Fah.

## THE COLD BATH PLATINOTYPE PROCESS.

BY W. WILLIS.\*

TO-NIGHT I propose to confine myself solely to remarks and illustrations of a practical nature; and for general principles I will refer members to a paper read by me at the last Camera Club Conference, and subsequently published in the *British Journal of Photography*. In the paper just referred to, I alluded to the fact that the simplest and most natural of the modifications of the process is the last to evolve itself as a workable method. It is certainly strange that the one method which is similar in form to the iron processes which preceded it—such as the cyanotype, chrysotype, &c.—and the one on which I first experimented, though unsuccessfully, should have taken so long to come to perfection. But though a simple method in theory, yet it has cost more labour and experiment than all the other modifications. And this is not surprising, seeing that several important conditions to success had to be found out, and that a very large number of variations were to be examined and estimated. But I think I may safely say that this method is now not only reduced, as it were, to its lowest terms, but is also put into its best possible form.

In this modification of the process, you are probably all aware, in the first place, that the platinum pigment is derived entirely from the platinum salt in the developer; and, in the second

\* A Communication to the London and Provincial Photographic Association.



place, that the name of the process is taken from the condition of the developer, which is used cold or at ordinary temperatures. I hope to be able to show reasons why this method is entitled to the highest rank among plain paper processes; and this not only on account of the artistic quality of its results, but also because it places in the hands of the printer large opportunities for modifying results.

I will now proceed to describe all the most important conditions to be observed in printing operations.

Firstly, the paper must be protected against contact with metallic dust, or metallic substances, and for this reason the inside of the calcium storage tube should be lined with paper, and the sensitised paper should be placed in the tube with its surface bent outwards. Then, in removing the paper from the tube, care should be taken to prevent its rubbing against any of the unprotected surfaces or edges. In opening and closing a tin or zinc tube, a number of metallic particles are abraded, and any of these attaching themselves will produce comet-like marks. For the same reason, in cutting up paper, care should be taken that the flat surface of the knife blade does not rub the paper.

Now, in order to obtain rich, plucky prints, and to secure a good developing action, the paper must be exposed in a damp state, or, if exposed dry, it must be damped afterwards, and before development. Perhaps, instead of using the word "damp," which is too strong a term, I should have said "not dry." By the exposure of the paper in a cold room at this time of the year—for, say, fifteen minutes before exposure—the paper will be sufficiently damp, or in a dry season a similar exposure in a dampish room will usually be sufficient.

If exposed dry, a similar exposure to damp air before development will be sufficient. But I must here point out that exposed prints, if preserved in a slightly damped state, will slowly gain a tendency to give more half-tone when developed. It is impossible to give any exact time indications, but I should say, as a general rule, that prints removed from the frames, and then put into a drawer for twenty-four hours, will, if then developed, show a maximum of half-tone; after a still longer period fog may set in, but I have not yet seen it; though undoubtedly such a long treatment tends to muddiness.

To contrast the three modes of using the paper:—

No. 1.—If exposed dry and developed without any damping, the prints tend to coldness of colour, feebleness, and sometimes granulation.

No. 2.—If exposed damp and then developed without "ageing," the prints will tend to warmth of colour and maximum pluck without granulation.

No. 3.—If the prints are kept in the same state of dampness as they are when removed from the frames for a long period, or, to apply a term just used, if they are "aged," then they will give on development, warm prints with a maximum of half-tone.

You will at once see that by a little attention to these conditions it is quite possible (as a matter of fact, it is very easy) to obtain from the same sheet of paper a plucky print from a thin negative, and a print full of half-tone from one of strong contrast. The conditions, after a little experience, are much more easily controlled than described.

The necessary presence of moisture in the paper during printing operations fortunately enables us to work in a much more convenient manner than formerly, and I strongly recommend the use of flat boxes with hinged covers, of wood or of paper, one to hold paper to be exposed, and another one to receive exposed prints. Some of the paper boxes made to hold invoices or music are well suited to the smaller sizes of prints.

I will here mention a little precaution which may be useful to some workers; it is this—before handling cold bath paper see that your fingers are not contaminated with platinum salt derived from paper which contains it in its coating, and if your negatives have been used on such paper give them a careful dusting. The neglect of this precaution may involve some curious spots and markings of a slightly brownish colour.

Now, as to judgment of exposure. I know that there are some who fail to see clearly when to stop, and in many cases this may be due to a tendency to colour blindness, but my experience is that most operators are as accurate as they are with silver printing. But the cold bath paper is undoubtedly easier to estimate correctly than hot bath paper. I would suggest that, as a general rule, it is better not to judge solely by the appearance of the high-lights, or of the shadows, but to look first for the degree of visibility of the high-lights, and then to estimate, in relation to this, the strength of the printed shadows. In other words, an estimation of the appearance of the image as a whole is the best

method. The only difficult negatives to print are those which are deficient in contrast, or are in a "low key;" but even these are usually made easy by blackening the rebate, so that during exposure the printed image may be compared with the paper unaltered by light, which lies under and is protected by these rebates.

(To be continued).

## Patent Intelligence.

Patent on which the Fourth Year's Renewal Fee has been Paid.

15,757 of 1884. H. J. HADDAN. (Sack).—Heliographic Copying.

Specifications Published during the Week.

16 186. EDWIN JENNINGS BALL, of 39, Aynhoe Road, Hammersmith, W., in the County of Middlesex, Analytical Chemist, for "The Application of Photography to Automatic Sale and Delivery Machines, and the Utilisation of Automatic Sale and Delivery Machinery for the Production, Sale, and Delivery of Photographs.—Dated November 23rd.

The Patentee says:—

This invention consists of certain arrangements and combinations of mechanism whereby the same will automatically take, develop, and deliver a photograph by the ferrotype or similar process in exchange for a given coin or coins.

The prepared photographic plate of whatever kind that is to receive the impression rests on a framework suspended from a travelling carriage, crane, or arm. This framework is placed in a definite position behind a photographic lens.

A coin or coins having been inserted into the machine, the photographic plate may be suitably exposed by the removal of a shutter covering the lens. It is then carried by the carriage, crane, or arm, over the tanks or reservoirs containing the necessary solutions or other liquids, and is lowered into and lifted out of each of these in succession, and is finally ejected from the machine.

The carriage, crane, or arm, and the framework suspended from it, return to their former positions, and a fresh photographic plate is ready for the next exposure. By this means either negative or positive pictures can be produced according to the nature of the photographic plate, and of the solutions employed. The mechanism is enclosed in a box or outer casing, with a projecting arm mounted on a pedestal of such a height that the object or person to be photographed is in focus when resting against the said projecting arm.

The outside of the box is provided with an indicator by means of which the exposure can be adjusted to suit the light, the said indicator being marked somewhat as follows:—(1) "Sunshine," (2) "Diffused Light," (3) "Dull," (4) "Very Dull," (5) "Gloomy," and so on.

The weight of the coin or coins put into the money slot acts upon the long end of a bent lever, and causes the short end to vertically raise a hinged piece and adjust it behind a pin working in a slot in a guide.

The said hinged piece is connected by levers to a handle or knob projecting outside the case of the machine. By pulling the handle or knob the person desiring the photograph actuates the pin by means of the said hinged piece, and causes the said pin to open a door in the bottom of the plate box, and allow a photographic plate to fall through into a plate-carrier, arranged to catch and hold the said plate vertically for exposure.

The time of exposure is regulated as follows:—The indicator is in connection with a square horizontal shaft, from which a short arm hangs vertically over a wheel. The said wheel is provided with partial ribs or collars, that is to say, the said ribs or collars only partially extend round the circumference of the said wheel; these ribs or collars are equal in number to the graduations marked on the indicator, one reaching, say, three-quarters round the circumference, another five-eighths, a third one-half, and so on. If the wheel is made to revolve, it is obvious that, by adjusting the indicator so that the said vertical short arm is over the longest partial rib or collar, the plate will be exposed for a longer time than when over one of the shorter partial ribs or collars, since the said ribs or collars will act on the lower end of the short arm, and keep it out of its normal perpendicular position. Now, the wheel provided with these partial ribs or collars is made to revolve by the action of gravity on a weight attached to a string



fastened to the circumference thereof, the weight being released by a catch attached to the lever worked by the before-mentioned handle or knob projecting outside the case.

Power is also taken from this wheel to actuate two catches and release the plate-carrier and a train of wheels. This is effected by an eccentric on the shaft on which the exposure-wheel works. When the exposure is completed, a bell or similar device is sounded, intimating that the time of exposure has expired.

The said plate-carrier slides upon a square shaft by the action of gravity on a weight attached to the end of a string running over a pulley. The extremity of the said square shaft is pro-

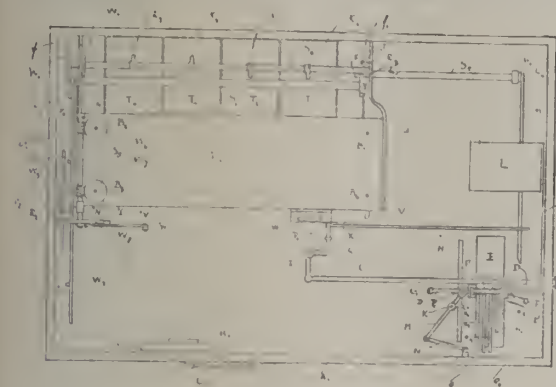


Fig. 1.

vided with a horizontal lever, which rests against one side of a wheel furnished with blocks, by means of which the said horizontal lever is depressed when the wheel is revolved. The plate-carrier will travel along the square shaft until its progress is barred by a stop, the said stop being so arranged that it holds the plate-carrier just at the very moment that the block on the revolving wheel actuates the said lever revolving the said square shaft.

By this action, the plate-carrier will be dipped into the trough immediately under the said stop. The motion of the plate-carrier is impeded by any suitable number of these projecting stops, according to the number of developing solutions or other liquids into which it is required to dip the plate.

The plate-carrier having finished its travel, a catch thereon impinges against a projection on the side of the case whereby the plate is released and falls into a slot made to receive it.

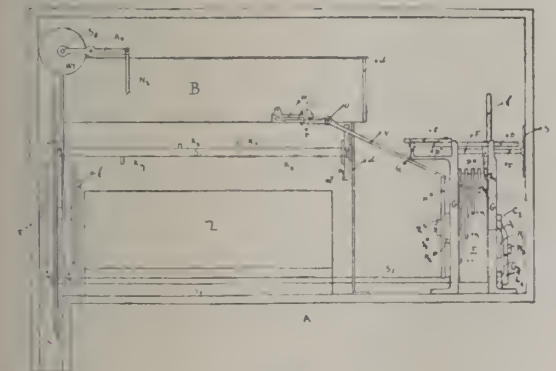


Fig. 2.

When it falls into this slot a second bell or similar device is sounded, intimating that the photograph has been through all the developing solutions or other liquids and is ready for delivery.

To obtain the photograph it is necessary that the person desiring the same shall actuate a lever, the said lever being so arranged that it winds up the different wheels which have run down, and adjusts the catches thereon, pushes forward the plates in the plate-box, and allows the said photograph to fall out of the said slot.

And in order that my invention may be more fully understood and carried into practice, I will now proceed to describe the

same with reference to the accompanying drawings, in which similar letters indicate corresponding parts in all the figures.

Figure 1 is a sectional plan of my invention.

Figure 2 is a sectional side elevation of the same.

Figure 3 is a sectional front elevation of the same.

Figure 4 is a sectional end elevation of the same; and

Figure 5, to 7, show details of construction.

The outer casing A<sup>1</sup> is provided with a projecting arm not shown in the drawings, and mounted on a pedestal to such a

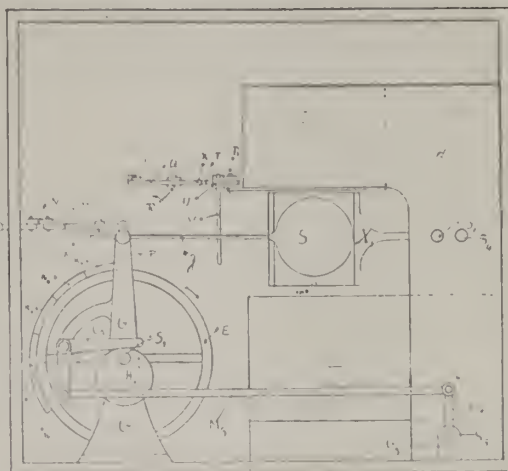


Fig. 3.

height that the object to be photographed is in focus when resting against the said projecting arm.

The projecting arm is provided with a knob which the person desiring the photograph must press so as to release one of the two catches on the exposure wheel E.

The block O forms part of the indicator for adjusting the exposure to suit the light. When the said block O is moved in the slot O<sup>1</sup>, it actuates the series of levers and connecting rods N, M, and D.

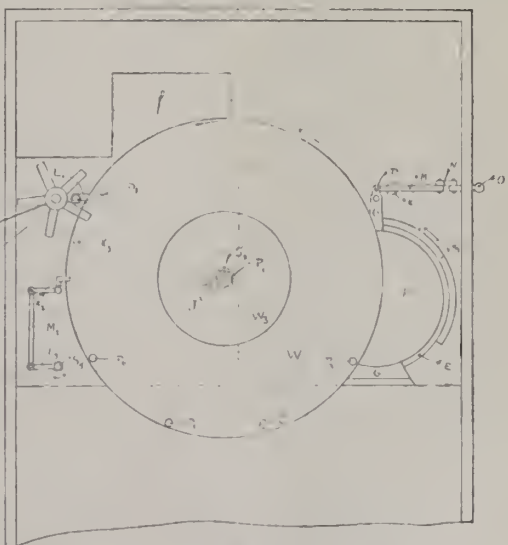


Fig. 4.

The connecting rod D carries the short arm P (see figure 2), and brings it vertically over one of the partial ribs or collars  $n_1$ ,  $n_2$ ,  $n_3$ , &c., on the exposure wheel E.

When the exposure wheel E is revolving one of the partial ribs or collars  $n_1$ ,  $n_2$ ,  $n_3$ , &c., thereon will turn the short arm P out of its normal vertical position. The short arm P is attached to a rod g and disc S (see figure 3). It will be seen that if the



exposure wheel E is revolving in the direction of the arrow shown in figure 3, the disc S will be raised vertically, so as to expose the focussing lens L, which is immediately behind the said disc S (see figure 1). When the exposure is completed, the disc S will fall, and can be so arranged as to sound a bell or similar device, not shown in the drawings, intimating that the exposure is completed.

The coin or coins, when dropped into the slot *h* (figure 2), fall upon the long arm of the bent lever V, to the short arm of which the piece T is attached. The piece T is hinged at X, and is brought into a horizontal position by the action of the coin or coins on the lever V. The said piece T is now ready to enter the guide W, and move the pin P<sub>2</sub> along the slot therein. If the knob or handle A be now pulled out, it will actuate the connecting rods C and Q, and cause the piece T to travel horizontally in the opposite direction along the guide W, and actuate the pin P<sub>2</sub>, working in a slot in the guide W, as shown in figure 1.

The rod C is rigidly connected in any suitable manner to the trough nest Z, so that each time the rod C is actuated the solutions are agitated.

The bottom end of the pin P<sub>2</sub> is connected to a door sliding horizontally on the bottom of the plate-box B. The top end of the pin P<sub>2</sub> is connected to a rod, not shown in the drawings, which releases one of the catches on the exposure wheel E. If, now, the second catch is released by the person desiring the photograph, the exposure wheel E will revolve by the action of a weight attached thereto, hence the horizontal motion of the pin P<sub>2</sub> will allow the prepared photographic plate to fall into the plate-carrier X (see figure 3), and will also allow the wheel E, regulating the time of exposure thereof, to be started when the button at the end of the arm outside the box is pressed. The said plate carrier X, is connected, by means of a long arm to a disc Y (hereinafter called the carrier Y) working on the square shaft S<sub>1</sub>.

Figure 5<sub>a</sub> is a sectional elevation of the first trough T<sub>1</sub>, and shows the carrier Y impinging against the first stop K<sub>4</sub>.

Figure 5<sub>b</sub> is a plan of the first stop K<sub>4</sub> and carrier Y.

The carrier Y is actuated in the following manner:—

When the catch K<sub>1</sub> (see figure 1) is released as will be explained hereafter, the carrier Y is caused to travel along the square shaft S<sub>1</sub>, by the tension on cords attached to the said carrier Y, the other end of the cords being led over a pulley and fastened to a weight W<sub>10</sub> as shown in figure 7<sub>a</sub>.

The carrier Y will travel along the shaft S<sub>1</sub> until it impinges against the stop K<sub>4</sub> attached to the shaft S<sub>4</sub> (see figure 1). The said shaft S<sub>4</sub> is horizontal, and parallel to the square shaft S<sub>1</sub>, is circular in cross section, and is provided with any suitable number of these projecting stops K<sub>4</sub>, K<sub>5</sub>, K<sub>6</sub>, K<sub>7</sub>.

The apparatus, as illustrated, shows the invention fitted with four stops, K<sub>4</sub>, K<sub>5</sub>, K<sub>6</sub>, and K<sub>7</sub>, and four troughs of developing solutions and other liquids T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, and T<sub>4</sub>; but I do not confine myself to these or to any other number, as it is obvious that the invention is equally applicable for any number of troughs, and the stops on the shaft S<sub>4</sub> will be made to correspond.

To the front end of shaft S<sub>1</sub>, and secured to it, is a ratchet wheel R<sub>2</sub> shown in plan in figure 1 and in elevation in figure 6<sub>a</sub> fitted with a horizontal pawl J<sub>1</sub>. This pawl J<sub>1</sub> is attached at right angles to a lever L<sub>2</sub> swinging horizontally on a fulcrum f<sub>1</sub>. The ratchet-wheel R<sub>2</sub> is provided with five teeth where there are four stops, six teeth where there are five stops, and so on, the number of teeth being always one more than the number of stops. On the back end of the shaft S<sub>4</sub> is fitted a wheel W<sub>4</sub>, shown in elevation in figure 6<sub>b</sub>, having one end of a string attached to its circumference, the other end being attached to a weight O<sub>2</sub>. The said shaft S<sub>4</sub> is also provided with a star wheel W<sub>5</sub> (see figure 4) the radiating arms of which are equal in number to the teeth on the ratchet-wheel R<sub>2</sub>, in this case five. These radiating arms are acted on separately by pins P<sub>3</sub>, P<sub>4</sub>, &c., on the back of the wheel W<sub>2</sub>. A front elevation and plan of the wheel W<sub>2</sub> are shown in figures 5<sub>a</sub> and 5<sub>b</sub>. The front side of this wheel carries the blocks V<sub>1</sub>, V<sub>2</sub>, V<sub>3</sub>, V<sub>4</sub>, which act on the lever L<sub>1</sub>, rotating the shaft S<sub>1</sub> (see figures 1 and 4). The pins upon the wheel W<sub>2</sub> are so placed that when the blocks on the front side of the wheel W<sub>2</sub> allow the lever L<sub>1</sub> to assume its normal horizontal position, one of the pins (say pin<sub>1</sub>) will act on one of the radiating arms of the star wheel, and cause the same to revolve through about one-fifth of a revolution when there are five arms, about one-sixth of a revolution when there are six arms, and so on. The revolution of the star wheel W<sub>5</sub> will cause the shaft S<sub>4</sub> and all its attachments to revolve also.

I will describe the invention with reference to the drawings,

which show the shaft S<sub>4</sub> fitted with four projecting stops. The shape and position of these stops are shown in figures 6<sub>a</sub> to 6<sub>d</sub>, and it is assumed that the carrier Y is starting from the front end of the shaft S<sub>1</sub>, and that the first stop (K<sub>4</sub>) is in gear. It will be seen that when the shaft S<sub>4</sub> moves through one-fifth of a revolution, the first stop (K<sub>4</sub>) moves out, and the second stop (K<sub>5</sub>) moves into gear, and when the shaft S<sub>4</sub> moves through another one-fifth of a revolution, the second stop (K<sub>5</sub>) moves out, and the third stop (K<sub>6</sub>) moves into gear, and so on. It will also be seen that the second stop (K<sub>5</sub>) is partially in gear when the first is in full gear, the third stop (K<sub>6</sub>) is partially in gear when the second (K<sub>5</sub>) is in full gear, and the same with the fourth and third; and also that when the fourth stop (K<sub>7</sub>) is out of gear, all the other stops are likewise out of gear.

When the shaft S<sub>4</sub> is rotated by the star W<sub>5</sub>, the weight O<sub>2</sub> attached to wheel W<sub>4</sub> is wound up, and is kept so by the action of the ratchet wheel R<sub>2</sub> (see figures 6<sub>d</sub> and 6<sub>a</sub>). The action of the gear is as follows:—

When the catches, K<sub>1</sub>, figure 1, and K<sub>2</sub>, figure 4, are released by the action of the exposure wheel E, the carrier Y slides along to the first stop, K<sub>4</sub>, the wheel W<sub>2</sub> commences to revolve, and one of the blocks V<sub>1</sub>, V<sub>2</sub>, V<sub>3</sub>, V<sub>4</sub>, thereon depresses the horizontal lever L<sub>1</sub>, rigidly fixed to the shaft S<sub>1</sub>, causing the same to revolve in the direction indicated by the arrow shown in figure 5<sub>a</sub>, and to dip the plate and plate-carrier, X<sub>1</sub>, into the trough, T<sub>1</sub>, underneath the first stop, K<sub>4</sub>. When the arm of the carrier Y again becomes horizontal, the pin P<sub>3</sub>, on the back of the wheel W<sub>2</sub>, has acted on one of the arms of the star wheel W<sub>5</sub>, rotating the shaft S<sub>4</sub> and the stops attached thereto through one-fifth of a revolution. This rotation causes, first: the first stop, K<sub>4</sub>, to be thrown out of gear; second: the second stop, K<sub>5</sub>, to be thrown into gear; third: moves the ratchet wheel R<sub>2</sub>, on one tooth; fourth: winds up a little the weight, O<sub>2</sub>, attached to the wheel W<sub>4</sub>; and fifth: allows the carrier Y to continue its progress until it impinges against the second stop, K<sub>5</sub>. The same operations are repeated at every stop, the pin, P<sub>4</sub>, acting on the star wheel, W<sub>5</sub>, and allowing the carrier, Y, to go as far as the third stop, and so on. When the carrier Y has passed the fourth stop K<sub>7</sub>, it has been pointed out that all the stops are out of gear, the object of this being that the said carrier Y may be returned along the shaft without coming into contact with any of the stops after the plate has been released from the plate carrier X<sub>1</sub>. The carrier Y is returned along the shaft S<sub>1</sub> in the following manner, reference being had to figs. 7<sub>a</sub> and 7<sub>b</sub>, which show respectively plan and elevation of the apparatus with the plate-box B removed and to fig. 7<sub>c</sub>. The carrier Y is provided with a flange Y<sub>1</sub> and with a collar Y<sub>2</sub>. An arm Y<sub>1</sub> provided with a circular hole for the purpose, fits over the carrier Y, and is placed close against the flange Y<sub>1</sub> being kept in position by the ring or collar Y<sub>2</sub>, which also fits over the carrier Y. This arm Y<sub>1</sub> is pendant from a sleeve Y<sub>3</sub>, upon the shaft S<sub>2</sub>, which acts as a stay for the arm Y<sub>1</sub>. The shaft S<sub>2</sub> is vertically above the shaft S<sub>1</sub>, and is parallel and equal in length thereto. Upon each side of the arm Y<sub>1</sub> a hook Y<sub>4</sub> is affixed to which the cords are affixed, one leading to the weight W<sub>10</sub>, which actuates the carrier Y. (see fig. 7<sub>b</sub>), and the other leading by suitable pulleys to the drum W<sub>9</sub> upon which it is wound (see fig. 7<sub>a</sub>). If now the drum W<sub>9</sub> be revolved in the opposite direction to the hands of a watch it will wind up the cord attached to the arm Y<sub>1</sub>, and hence will return the carrier Y to its initial position on the shaft S<sub>1</sub>. Just before the carrier Y reaches its normal position on its return the front side presses up against the lever L<sub>2</sub> (see figure 1), and throws the pawl J<sub>1</sub> out of gear. The weight O<sub>2</sub> on the wheel W<sub>4</sub> now runs down and revolves the shaft S<sub>4</sub> star wheel W<sub>5</sub>, and stops and ratchet wheel, R<sub>2</sub>, attached thereto in the opposite direction until the first stop, K<sub>4</sub>, again comes into gear. A pin is so placed on the ratchet wheel R<sub>2</sub> that it will come into contact with a stop on the standard *d* and check the revolution of the said ratchet wheel R<sub>2</sub>, at this point bringing the first tooth of the said ratchet wheel opposite to the pawl, J<sub>1</sub>, so that when the carrier Y starts upon another journey the pawl J<sub>1</sub> gears into the first tooth of the ratchet wheel R<sub>2</sub>, and this part of the apparatus is ready to perform its allotted work.

(To be continued.)

Patents stated in the Official Journal to have become Void by Non-payment of Duty. Non-payment of Fourth Year's Fee.

4,152 of 1883. E. DE ZUCCATO.—Producing Prints, &c.

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## Proceedings of Societies.

### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

At the ordinary monthly meeting of this Society, held on Tuesday evening, the 11th inst., at the Gallery in Pall Mall East, the chair was occupied by JAMES GLAISHER, F.R.S., President.

The business of the evening was the discussion of Capt. Abney's paper on the "Measurement of the Sensitiveness of Silver Salts to various parts of the Spectrum," which had been read at the previous meeting in November; and JOHN SPILLER, who had put his remarks into a short paper, opened the discussion by reading his observations, in the course of which he enquired, firstly, why ultramarine had been selected as the blue pigment of purest tone? Secondly, as to cyanine, it was, he said, time we began to refine our nomenclature. The blue colouring matter of certain flowers, such as the blue iris, the corn flower, and others, had been called cyanine. Then there was chinoline and iodide of amyl, which had been called by the same name. Further, there was cyanosine or methyl eosine. In orthochromatic photography fifteen varieties of eosine, including cyanine-erythrosine, had been used or experimented with. Chinoline of various kinds, including chinoline red and chinoline blue, had been introduced for orthochromatic purposes by Vogel. If, as he inferred, chinoline was the cyanine referred to by Capt. Abney, there was so much iodine contained in it as to justify the supposition that the iodine would act directly upon some of the sensitive silver compounds upon the plate and form iodide of silver. He also wished to know what amount of erythrosine or cyanine had been used in the experiments detailed by Capt. Abney.

W. E. DEBENHAM said that there were two points in Captain Abney's paper to which he wished to refer. It was stated that it had been accepted hitherto that the density of deposit upon various parts of the spectrum photograph might be taken as measures proportionate to the action of light in those parts, whilst the present detailed experiments showed that this proportion was by no means justly maintained, and therefore that amount of density was not in the same proportion as amount of action of light. This result was only what was natural from a characteristic of photographic processes which had been frequently pointed out, and forcibly insisted upon by Captain Abney himself, namely, that there was in all photographic actions, differing in degree with different processes, an imperfect rendering of gradation at both ends of the scale, particularly at end of the scale representing the largest amount of exposure. In consequence of this failing, it followed that density would not be strictly proportionate to the amount of light acting upon the plate. The other matter to which he wished to refer, was the statement attributed in the paper to Mr. Warnerke, that an intermittent action of light was more effective than the same amount of light action given in one exposure. He was pleased that Capt. Abney had practically examined, and found that there was no basis for such an assertion, but he believed that Mr. Warnerke was not directly responsible for the statement, but he merely mentioned it as having been communicated to him by a Russian photographer. It was unfortunate for photography that assertions based upon inaccurate observations were so often put forward. It sometimes happened, too, that scientific men accepted these statements without sufficient examination, and thus fallacies were propounded as facts in books that were taken as photographic text books, in a way that would not be tolerated in any other science. He was glad that one such fallacy was disposed of by Capt. Abney's paper. In the particular case in question, the photographer's observation might possibly be correct, that so many seconds of intermittent exposure gave more photographic action than an exposure of the added number of seconds given consecutively would do, and yet that there was nothing paradoxical or proving intermittency to have any effect in aiding the action of the sum total of light upon the plate. The photographer in question had been using the electric light. Now, he was not aware what was the source from which that light had been derived, but if, for example, it had been a bi-chromate battery, and the light was produced, and its action suspended by immersion and withdrawal of the plates from the cells, there would actually be increased electrical action by the very disturbance of the solution, so that there might be as much light actually given out during a certain number of seconds of alternate exposure as would be the case during a much longer period of continuous exposure.

FRIESE GREENE inquired whether Captain Abney had found

out what colour was absorbed by the films he used. His own experiments had shown that gelatino-bromide of silver absorbed the green rays particularly. Chloride of silver also possessed the same power. He proposed at an early meeting to make a demonstration proving this statement before the Society, by exposing a plate to the action of the spectrum. He would like to know what was the developer employed in Captain Abney's experiments.

W. BEDFORD wished to know whether a colour-screen had been used, and if so, what kind, when photographing the four colours of the chart that had been shown. He also inquired whether Captain Abney could so arrange a colour-screen with similar four colours, but varying in depth, that on an ordinary plate they would appear of one intensity. Upon employing such a screen with an orthochromatised plate it would at once be seen what was the colour which gained with the particular plate used.

CHAPMAN JONES said that Captain Abney had shown a colour chart with four colours thereon, and had stated that a plate which would render those four colours in due relation would be perfectly orthochromatic, and would render any other colour properly. He wished to know whether the expression colour was meant to indicate light of every degree of refrangibility, or whether it was used with regard to pigment merely, in which case the classification was exceedingly valuable.

B. J. EDWARDS observed that the action of light from various pigments was very different from that of light of various parts of the spectrum. He did not think the spectrum was much of a guide for the action of light proceeding from coloured bodies. This was probably accounted for by the fact that most pigments reflected a great deal of light of all colours. Pigments of different compositions also produced different effects upon the plate.

Capt. ABNEY, replying to the several speakers, said that Mr. Spiller had enquired why he had used French ultramarine. He had used French ultramarine, vermilion, and emerald green because those three pigments were very close approximations to the three colour sensations which served to produce the effect of white light upon the eye. The colour yellow, he thought, might be left out of a chart; it was perfectly immaterial whether it was used or not. The effect of green and red taken together completely represented yellow, and there was no necessity for a separate space for that colour. If you can photograph the three colours named, you can photograph any colour, pigment or otherwise. Cobalt would be an unsuitable blue, as it contained a great deal of red, of which French ultramarine contained but very little. Prussian blue contained too much green. The next question was as to the cyanine used. It certainly was not a product of flowers; it was some prepared by Williams—the same, he believed, was sold commercially as cyanine; it was an amyl derivative of chinoline. The third question was as to how much cyanine had been used. It was a very small quantity; five grains of cyanine had been dissolved in one ounce of alcohol. This solution had then been diluted with alcohol to two ounces. The plate was flooded with the solution, and was sometimes dried, and sometimes not. It was then placed in a bath of methylated alcohol to get out as much of the cyanine as possible. Erythrosine was treated much in the same way, but with a little water in the spirits. It was a great improvement to get rid of as much of the dye as possible. Mr. Debenham was quite right as to the want of increase of density in proportion to increase of exposure, and had done service in pointing this out. He was also right in regard to the statement which had been attributed to Mr. Warnerke. It was Levitsky's statement which had been communicated by Mr. Warnerke. It was not practicable, as suggested by Mr. Greene's question, to examine the absorption spectrum of the plate, as the very small quantity of dye present would be decomposed immediately by the light used to produce the spectrum. Dr. Vogel had latterly been trying to find where he and the speaker coalesced. He hoped that Vogel was coming round to his view. Mr. Greene would see that it did not matter one iota what developer was used, so long as the development was done to scale. In reply to Mr. Bedford's question, as to what screen was used it had been stated in the paper that the lens was coated with turmeric solution in collodion. A colour scale might easily be arranged on the plan suggested by Mr. Bedford, and prove very convenient. When desired to use transparent media in place of three pigments he had referred to, it would be found that glasses of signal blue, of green produced by ferrous salt, and of red produced by copper and silver, would yield



results almost identical with those obtained by the three pigments, French ultramarine, emerald green, and vermilion. Mr. Edwards had pointed out that all pigments were not alike in photographic value. If he looked over the published report on the action of light on water-colours by Dr. Rupell and himself, he would find that question dealt with. The colours which he had chosen for orthochromatic testing purposes were those known in the arts, and procurable of an even quality. He would make an exception, and mention the name of the makers, Winsor and Newton. The colours were not laid on thinly so as to leave paper showing through, but were laid on like paste. The blue, red, and green were all that were necessary; yellow was utterly superfluous. Yellow was very far more luminous to the eye than the other colours, which were on some sort of equality with each other in that respect. Yellow, however, had quite a different scale or gamut of luminosity.

A vote of thanks to Capt. Abney and J. Spiller was unanimously accorded, and the President then called attention to the fact that by the new rules of the Society, all the officers vacated their positions annually, but were eligible for re-election. Nominations must be received not later than January 21st.

The usual technical meeting of the Society will be held this month a week earlier than customary, viz., on Tuesday next, the 18th inst.

The following were elected members of the Society: W. F. Amey, E. Baker, A. D. Edwards, W. G. Herdman, U. French, R. H. Macey, J. H. Mummery, H. Walter.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE usual weekly meeting was held on the 5th inst.; W. BEDFORD occupied the chair.

A paper was read by W. WILLIS on "The Practical Working of the Cold Bath Process" (see p. 793). During the reading of the paper, Mr. Willis demonstrated the working of the process by developing a number of prints that had received exposure. Several of the smaller series were developed with a flat brush to show the possibility of development by this method. To be perfectly successful, this requires some little dexterity. Among other points of detail, the lecturer drew attention to and contrasted prints developed directly after exposure, with others that had been allowed to "age" by lapse of time before development. The difference was marked, the latter showing to much greater advantage in the half-tones. By experiment, it was found that the maximum time for allowing prints to lay before development was twelve hours; a longer time than this would produce flatness and fog. The brilliancy of the prints was not altered in the drying.

H. M. HASTINGS asked how this process compared with silver printing with regard to time of exposure.

W. WILLIS said, roughly about one-third less. He gave preference to this process, and he believed it would supersede the hot bath.

A. HADDON asked if the same results were obtained by using a diluted and restrained developer.

W. WILLIS was inclined to think that in the hands of an expert the diluted developer was the best.

J. TRAILL TAYLOR spoke of the advantage this process possessed over the older ones, inasmuch as in the latter the platinum salt was in the paper itself, which was not the case with the cold bath process.

W. WILLIS said undoubtedly this was a very great advantage in the new paper; there was no platinum to wash out, and consequently the whites were distinctly purer.

A. HADDON asked how long the platinum salt would remain good in solution.

W. WILLIS replied, a long time; he knew of no advantages from adding old developer to that about to be used.

J. TRAILL TAYLOR, referring to the lecturer's recommendation for keeping the paper, described a box suitable for the purpose; it was made of wood, and having a hinged lid. A piece of board or stout cardboard fitted the inside of the box, covering the paper, a weight keeping it flat.

J. J. BRIGINSHAW used a similar box for keeping cut sizes of sensitised paper.

The CHAIRMAN had tried development with a brush, but had not succeeded, the prints being streaky. He would like to know if with the brush there was any danger of removing the ferrous salt.

W. WILLIS said prints might be brushed freely without any risk whatever. He thought the Chairman would have been successful had he used a diluted developer restrained.

J. TRAILL TAYLOR thought a better name than the "cold bath" might be given to the process.

J. GOODWIN asked how long paper would keep after exposure if kept quite dry.

W. WILLIS replied, three or four weeks. On one occasion he put a print in his breast pocket, and forgot it for some days; it turned out the best print he had ever developed. He had some prints by his first process, silver and platinum, developed in 1873 that were as good now as at first.

H. S. STARNES exhibited some lantern transparencies by a new gelatine process, the result of some experiments. In coating the plates from which these transparencies had been made, one-quarter of a grain of silver to each plate only had been used.

A question from the box was read:—"How is it that in some lenses of the rapid symmetrical type, six reflections can be seen, whereas in others only five were visible—which of the two is to be preferred?"

J. TRAILL TAYLOR illustrated by diagrams the lenses made by Morrison, of the States, and also a lens by Beck, subsequently referring to the advantages of the new glass lenses made from this glass, which gave equal definition all over the field with a very large aperture.

A hearty vote of thanks to W. Willis for his interesting paper closed the proceedings.

#### CAMERA CLUB.

ON Thursday, December 6th, the subject was "Single and Stereoscopic Hand Cameras." E. R. Shipton gave an address, A. STROH in the chair. A variety of hand-cameras were on show, lent by Marion and Co., Shew and Co., the London Stereoscopic Company, and the Eastman Film Company. Other hand-cameras were shown by members. Lantern slides from hand-camera negatives were put through the lantern: Kodak slides by Messrs. Walker, Dresser, and others; Krugener book camera slides lent by Marion and Co.; and slides from Shew and Co.'s fixed-focus hand-camera. Other work illustrating detective cameras was shown by Mr. Strohm, from his own well-known stereoscopic hand-camera; J. B. B. Wellington, from a camera of his own invention.

In addition to the lantern exhibition, the subject of stereoscopic work was illustrated, an exhibition of stereoscopes and pictures being arranged in the rooms. The whole of the stereoscopic slides sent in for the *Amateur Photographer* stereoscopic slide competition were on view. The lecturer gave an interesting account of the difficulties experienced in obtaining the construction of a stereoscopic hand-camera to his exact desire, and described the special dangers to be avoided in designing such an instrument. He further explained in detail the working of his camera, and exhibited slides which showed great depth of definition.

Hand cameras were then explained: the Kodak by Mr. Walker; McKellen's, the Parcel camera, and Krugener's book camera (Marion and Co.), by Mr. Shipton; the Stereoscopic Company's stereo-camera, by Mr. Shipton; Beck's camera, by W. M. Robertson; Shew's camera, by Mr. Shew; and Mr. Wellington's hand-camera, by himself. The discussion was continued by Mr. England, the Rev. A. Cotton, and the Chairman, who gave a demonstration of his own stereo hand-camera.

The HON. SECRETARY announced that the stereoscopic exhibition in the Club rooms would be continued for about a fortnight. Admission could be obtained on presentation of card.

The subject on Thursday, December 20th, at 8 p.m., will be "Development," when a paper will be read by J. Cadett.

#### COVENTRY AND MIDLAND PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society was held on Dec. 5th, President ANDREWS in the chair.

Messrs. Astley, Browett, and Parker were elected members of the Society.

The Chairman showed some beautiful studies of breaking waves, &c., and Mr. Ambrose some lantern slides; Messrs. Owen and Orton also showed some transferotype prints on opal.

H. STURMEY then proceeded to give a demonstration of "Lantern Slide making by Contact." Commencing with describing the methods of exposure for various classes of negatives, he made several exposures, and developed the same with the ferrous-oxalate developer, giving full particulars as to fixing, clearing, printing in clouds, concluding with the binding of a finished transparency.

A vote of thanks was passed to Mr. Sturme for his interesting and instructive paper.



The question-box was then opened, and the questions it contained discussed and answered.

The meeting then resolved itself into a special meeting for the consideration of the new rules drawn up by the committee, which, after some slight alterations, were adopted.

#### NORTH LONDON PHOTOGRAPHIC SOCIETY.

AN ordinary meeting was held on December 4th, at Myddleton Hall, Islington, J. TRAILL TAYLOR (President) in the chair.

L. Barker and S. G. Witty were elected members.

Mr. TAYLOR gave an address on "Dissolvers for Single Lanterns"; he also showed and explained the principal types of slide carriers.

L. MEDLAND exhibited his adapter carrier for lantern transparencies. It was made the length of four lantern slides.

A. MACKIE thought that there should be a standard thickness for slides, as they vary so much in thickness, this being very inconvenient in exhibiting.

Mr. MEDLAND asked if the slide should be as close to the condenser as possible.

Mr. TAYLOR said that in the case of a four-inch condenser the slide should be as close as possible, but if the condenser was larger the distance should be increased.

E. CLIFTON proposed two thin plates of celluloid to dissolve the slide into a white haze instead of shutting off all light.

The next meeting will be held on Tuesday, December 18th, when Mr. Clifton will read a paper on "Making Transparencies from Negatives, by Means of the Camera."

#### SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE ordinary meeting of this Society was held on Tuesday, December 4th.

In the absence of the President, Mr. Frith, the chair was ably filled by Mr. SHIELDS.

After the balloting for new members, the meeting unanimously desired the Secretary to send a letter of condolence to Mrs. Barber, sen., sympathizing with her on the loss of her son, and a much esteemed member, Mr. F. Barber, who will be remembered by photographers generally for his contributions and experiments in demonstrating the safety or unsafety of the ethoxo light, and also that large picture of an Atlantic iceberg.

Mr. H. S. BELLSMITH then introduced in terse and understandable language the stripping films, bromide paper, and kodak camera of Messrs. Eastman and Co. He practically demonstrated the advantages of the stripping film.

The bottom facts of portability, exposure without halation, development, printing, storage, &c., were discussed, and readily grasped.

A vote of thanks to the lecturer concluded the meeting.

#### LEWES PHOTOGRAPHIC SOCIETY.

AN ordinary meeting of this Society was held in the Glee Room, Cliffe, on Tuesday, the 4th inst., the President, J. G. BRADEN, in the chair.

The evening was devoted to an exhibition of lantern slides contributed by the President, and H. S. Starnes (Thornton Heath), C. A. Wells, R. Morphew, and F. Shoulders. The President manipulated the lantern, which he had kindly lent for the occasion. Some slides were passed through the lantern, consisting principally of local subjects, after which Mr. Starnes exhibited a number of slides.

A very pleasant evening was spent, and the Hon. Sec. gave notice that the next ordinary meeting would be held on the second Tuesday in January, instead of the first, the subject for discussion being "Toning, Fixing, and Mounting Prints."

#### DEVON AND CORNWALL CAMERA CLUB.

A MEETING was held at the Freemason's Hall, Cornwall Street, Plymouth, on Wednesday, December 5th, W. GAGE TWEEDY in the chair. S. C. GALT was elected a member of the Club.

A letter was read from the Secretary of the Cornish Camera Club, protesting against the appropriation of their county title. The secretary was directed to inform the committee of that Club that it was considered there was sufficient distinction between the titles Cornish Camera Club, and Devon and Cornwall Camera Club, to prevent confusion; that from the position of Plymouth, and the fact that members were drawn largely from both counties, no other title would be as suitable; and that it was intended to retain the title as at present.

R. MURRAY then exhibited a number of lantern slides, dry collodion by the coffee process, from negatives taken thirty-three

years ago by the calotype process. Commencing with a view of the Marina, Malta, he proceeded to Egypt, and up the Nile, with very clear pictures of Cairo, the Sphinx, Pyramids, Thebes, Cataracts, Philo, &c., on the way. All these lantern slides were reduced in the camera from 10 by 8 negatives, and left little to be desired. The average exposure of the original negatives was about ten minutes. He then exhibited some of more recent date, of Exeter, Lynton, Ilfracombe, Netley, Lincoln, and other places. These photographs, taken so many years ago, were most favourably commented upon, with frequent remarks as to the little advance made since, the principal difference being the absence of movement in the earlier views on account of the prolonged exposure.

Dr. ALDRIDGE then showed a few, some being duplicates for comparison; some on Fry's, some on Thomas's plates; some developed with soda, others with iron. Mr. Carnell's were on Thomas's plates, maker's developer, from negatives on Eastman's stripping films, and were very fine; as were also Mr. Tweedy's instantaneous studies, diving, &c., on Thomas's plates, potash-pyro developer, from Ilford ordinary plates.

Messrs. HAWKER and HUDDY also showed slides of their own manufacture.

A vote of thanks was accorded to Mr. Murray for his interesting tour.

The next meeting will be held on December 19th, when Major Barrington-Baker will explain "How to Enlarge without a Condenser." Some specimens of apparatus will be shown, and novel points explained by the exhibitors.

#### NEWCASTLE-UPON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

ON Monday evening, the 3rd instant, a lantern demonstration of North Country Scenery, &c. (the work of members of the Association), was given before a crowded audience of over one thousand persons in the Literary and Philosophical Societies' Lecture Hall, Newcastle.

J. P. GIBSON described the slides, and Dr. Hardwich lent his lantern.

The following members sent slides:—M. Auty, J. P. Gibson, P. M. Laws, Edgar G. Lee, H. R. Procter, H. G. Ridgway, and L. Williamson, G. W. Wilson and Co., York and Son, and G. West and Son, also sent slides. Beard's latest automatic regulator, with Ives's porous saturator, and Brin's compressed oxygen, were used, and the light was very brilliant.

#### GLASGOW PHOTOGRAPHIC ASSOCIATION.

THE third general meeting of the session was held in the rooms of the Association, 207, Bath Street, on the 6th instant, Wm. LANG, Jun., in the chair.

Mr. LANG exhibited a positive which had been obtained direct in the camera. After exposure it was accidentally immersed in a mixed toning and fixing bath, and afterwards developed in the usual manner. The result was a positive of a rich purple tint.

ARCHIBALD ROBERTSON also showed a direct positive, and the subject was again postponed to admit of some suggested experiments being carried out.

Mr. J. CRAIG ANNAN then read a paper on "The History of Art Illustration, and its Relation to Photography at the present time." After explaining the principles of the intaglio and relief engraving processes, and also that of lithography, he traced the development of these methods, and showed how photography has been applied to produce designs for all of them, without the intervention of hand work. A number of early works in line etching and mezzotint engraving were hung on the walls, and a large number of specimens of the various photographic processes were also shown to illustrate the paper.

#### DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

THE third monthly meeting of this Association for the session was held in Lamb's Hotel, Dundee, on Thursday evening, the 6th inst., the PRESIDENT in the chair.

The council have arranged to give limelight exhibitions to several of the local charitable institutions, those given last winter having been so much appreciated.

V. C. BAIRD read a paper on "Printing Processes," illustrated by a number of prints, examples of the processes more generally in use. The variety of ready-sensitized paper recommended was double albumenized. Although the working is slightly more troublesome, it gives more brilliant prints than the single albumenized. Deep printing from strong negatives, and toning to a purple brown, was advised as an aid to permanency, as opposed



to the lightly-printed and toned pictures fashionable at present. Several of the specimens of gelatino-chloride prints were stripped from ground glass, giving them the appearance of a bromide print, but surpassing it in tone, softness, and fineness of texture. Plain salted paper (Marion and Co.) was represented by a number of prints, which attracted special notice from several of the members, who expressed themselves pleased that it was again coming to the front. A number of prints on opal, platinotype bromide, &c., were also exhibited.

Marion and Co. and the Ilford Company received a hearty vote of thanks for the specimens of the different printing papers and opals sent by them, which did much to enhance the interest of the meeting.

#### CARDIFF AMATEUR PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of the above Society was held at the above Society's new studio on Wednesday, the 5th inst.; Vice-President ALLEN in the chair.

The election of Messrs. John Gravey, Walter F. Croxton, Walter Reed, and W. J. Gray as ordinary members was confirmed, and Messrs. Sidney Jones and S. G. Fifoot were also elected.

The third annual meeting was afterwards held, Mr. ALLEN in the chair.

After the usual preliminary business had been transacted, the meeting proceeded with the election of officers, resulting as follows:—

*President*—J. Mansel Franken.

*Vice-Presidents*—Walter Insole, James Watson, J.P., S. W. Allen, M.I.M.E., and Alex. Kellar.

*Hon. Treasurer*—W. Foster.

*Hon. Secretaries*—G. H. Bedford and G. H. Wills, Junr.

C. F. Gooch, Geo. Shipton, H. L. Bridger, Rev. W. White-side, W. Windsor, J. H. Faulks, and Edward H. Bruton were elected to the council.

THE PRESIDENT stated that, in order to induce the members to patronize their outdoor excursions during the summer season, and to retain some permanent record of their studies in recreative photography, he should have much pleasure in offering a prize of £5 for the best series, of not less than six photographs, taken during the Society's excursions.

The customary votes of thanks brought a very interesting meeting to a close. We gather from the report that the council have provided a series of interesting lectures for the winter session.

### Talk in the Studio.

A REMARKABLE NEWSPAPER PUFF.—The *Cork Constitution* plays rather low down in a notice which appears on the third column of its issue for November 29th last, and the following is the notice in question, the name of the photographer only being expunged:—"Photography in Cork.—Recently, enormous strides have been made in Cork in the photographic studios, but the latest improvements adopted by M.— seem to eclipse everything introduced before them. The new process, which produces a beautifully soft and pleasing picture, might be styled *photo-engraveur*, or rather an improvement on this mode, which is very generally used for the illustration of high-class art magazines. The result resembles in every respect an engraving possessing the very desirable and necessary quality of permanency, and the photographs brought out to the present by M.— are remarkable for evenness of finish. As regards permanency, this style far surpasses the carbon process introduced some two years ago, and which, though supposed to be lasting, really is not. M.— has also gone in extensively for painting in oils on canvas and china, and this, too, with a very successful issue. The process is simple, and the picture is not alone equal, but far superior in many ways to that of the artist. An ordinary photograph is negative, and then, by means of the magic lantern, is reflected on the canvas or china, as the case may be. The outline is taken with chalk, and the skeleton afterwards filled-in in oils. By this means an exceptionally true painting is obtained, and at a very much cheaper price than any artist could labour for. M.— is to be congratulated for bringing these new introductions into the photographic world to the city, as they are sure to be the rage until they are outdone by, if possible, something more perfect."

NOTTINGHAM AMATEUR PHOTOGRAPHIC ASSOCIATION.—At the meeting held on Monday last, the time was devoted to experiments on the magnesium flash light, and several successful photographs were taken, one of the best being a 12 by 10 portrait of the president, taken by J. Carnell.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—Technical meeting Tuesday, Dec. 18, at 8 p.m., instead of the usual fourth Tuesday in the month (which will be Christmas Day).

PARIS EXHIBITION, 1889.—Her Majesty, by order in council, has been pleased to declare that the conditions of the Patent Act, 1883, under which an application for a patent is not to be invalidated by the exhibition of an invention at an international exhibition, are to apply to the Paris Universal Exhibition, and also that exhibitors are to be relieved from the conditions of the above Act, under which they were required to give notice to the Comptroller of Patents of their intention to exhibit the article afterwards sought to be patented. The regulations also apply to designs intended to be registered.

PHOTOGRAPHIC CLUB.—The subject for discussion on Dec. 19 will be "Intensification," with a demonstration by J. B. B. Wellington.

### To Correspondents.

Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIERCE and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

H. H. B.—The term, used as you say, certainly seems a barbarism and misapplication, but of the articles sold under this title we can say nothing, without some opportunity of examination. If the prints are platinotypes, the firm is justified in selling them as permanent, but to sell silver prints as permanent is certainly not the thing. Taking the information before us, we are inclined to think that prints on albumenized paper tend to fade rather more rapidly than those on bromide or bromo-chloride emulsion papers, but of these latter we have had numerous complaints recently.

WINCHESTER.—The negative is undoubtedly the property of the photographer in such a case as that which you describe, but he is certainly not justified in selling prints from it.

F. C. W.—We quite agree with you that the expansion of our remarks into such an article is somewhat of the nature of a compliment, although the matter has somewhat suffered by dilution.

HERMETICUS.—If you are a qualified analytical or experimental chemist there will be no difficulty. Your own work will be its own recommendation, and you will be admitted in due course. Write to the respective secretaries.

ARCHIBALD ROBERTSON.—The papers have not been re-published in book form.

MELANOGRAPHUS.—The paper in question was sold by J. R. Goz, of 19, Buckingham Street, Strand, London. As regards using the lens in the way you speak of, and for the same reason, all we can say is, that after having once done so, we sought in vain for any indications of disadvantages, although a very learned optician of our acquaintance demonstrated on paper several faults which the resulting photograph should have had. We are much obliged to you for the result of your experiment with the preparation referred to.

MAC.—The prints are collotypes, and the process is largely and successfully worked by Maelure and Macdonald, of Glasgow, and other large firms. It is troublesome to work on a very small scale, or occasionally.

BENJAMIN WYLES.—No such article as that to which you refer has appeared in the PHOTOGRAPHIC NEWS.

FORM.—You had better get photographic blocks made. Write to Dallas, of 9, Furnival Street, or Swain, 58, Farringdon Street, London.

J. P. S.—It seems to us that you are a little confused in your notions between "sulphite" and "sulphate." A sulphite is ready to take up oxygen and become sulphate; hence it is a reducing agent. Sulphate of soda is inactive, excepting in so far as it tends to prevent water penetrating the gelatine film.

C. SOLOMONS.—The process in question was introduced by Husnik about seven years ago, but as far as we know, is not worked commercially. One of the ordinary methods—with printing colours ground in oil varnish—seems always to have been preferred.

J. C.—1. Try the hydrokinone developer, several formulae of which are to be found in the YEAU-BOOK. 2. You appear to be labouring under a mistake. The basis is gelatine, not collodion.



# THE PHOTOGRAPHIC NEWS.



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### THE SPREAD OF PLATINUM PRINTING.

ONE of the most noticeable features in the history of photography during the now fast expiring year, is the advance in public favour which has been made by the method of printing in platinum as a basis in lieu of silver. This advance need not, however, be construed into an indication that the process of printing by means of silver salts upon albumenized paper runs any danger in the near future of being superseded or generally abandoned. Albumen silver printing has so often been threatened, only to continue the even tenor of its way, and to grow, if anything, in the amount of work habitually executed by its means, that those interested in the perpetuation of the process may well feel justified in disregarding the predictions of the enthusiasts who, on the introduction of any new printing process, or improvement, or more extended application of a printing process already in existence, are ready to prognosticate the speedy abandonment of the method which has so long held sway. Among silver printing processes, that with uranium and nitrate of silver in collodion (Wothlytype), collodio-chloride of silver, and more recently, processes of printing by development upon chloride and bromide of silver emulsified in gelatine, have been held out as the coming methods which would supersede printing upon albumenized paper. Perhaps the most serious attack upon the supremacy of this most universally followed process was when prints in carbon, pleasantly tinted by dyes to represent the tone of albumen prints, and developed upon collodion, were prominently brought to the notice of photographers some dozen years back. Some even declared their intention of printing entirely by the new method, and for a time acted in accordance with this declaration. After a while, however, most, if not all, of those who had so enthusiastically taken up with the new method of permanent printing found themselves compelled, for one reason or another, to return to their former practice, and printing by means of silver compounds upon albumenized paper continued its course, undisturbed by the wave of opposition with which it had been threatened. In recognizing a very great extension of the practice of platinum printing, and in being prepared to expect greater advances in this direction, it is not obligatory to look for general abandonment of albumen printing as a necessary concomitant.

A circumstance which has doubtless not been without influence in procuring a general appreciation of the results obtained by platinum, is the fact that judgment has been for the most part exercised in selecting pictures for printing by this method of a class most suitable for exhibiting it to advantage. Views of large size, and more recently portraits, still of large size compared to the cartes and cabinets with which we have so long been familiar, have been chosen as proper exponents for the class of prints furnished by platinum printing. For work of

smaller size, where it is desirable to obtain all the detail which the negative is capable of yielding, there have been very few attempts to supplant printing upon albumen paper by platinum.

As means all tending to further the spread of platinum printing, there have been introduced, concurrently with the increased public estimation in which the results of the method have been held, two distinct variations of the means of their production hitherto in common use. The labours of Pizzighelli, which have been so freely given to the world, have resulted in a process by which platinum prints may be produced either with the aid of development subsequent to exposure; or, as it is more commonly worked, by printing out in the pressure frame directly to the proper depth; no development being required. This method is comparatively new, and probably all the conditions necessary to success are not generally or fully realized; still, from the praise which it has received from some workers, whose ability stands high in public estimation, there need be little doubt as to the practicability and usefulness of the process where its conditions are understood. When this understanding is more universally arrived at, a much more extended use will doubtless be made of Pizzighelli's methods.

Another and very important variety in platinum printing methods is that recently described as the cold bath process. In this process, as in the earliest platinum process, there is no platinum employed in the preparation of the paper itself, but the print depends upon the reduction by light in the paper, by the action of light, of an iron salt in the ferric condition, to the ferrous state, platinum being employed subsequently as a developing agent. A good deal may be said in favour of this method of proceeding, which, moreover, is the one now preferred by Willis, who states that the process depending upon this reaction gives results which he considers superior to any other.

By using the iron salts alone in the sensitising bath, and reserving the platinum solution for development, there are at least two advantages gained. One—which might, perhaps, be passed over as scientifically unimportant, although of weight practically—is the consideration of expense. When platinum is contained in the paper itself, every part of the paper must contain a sufficient amount of the metal to yield the deepest black that may be required upon any part of the image. When, on the other hand, the platinum solution is used as a developing agent, the print, by being moved upon the surface of the solution, causes fresh portions of the liquid to be brought into contact with the places where the light has acted most strongly upon the iron salt, and where, therefore, it is required to build up the necessary depth or vigour of tone. The difference of strength of solution requisite is something like in principle—although not in degree—that which exists between the strength of a silver bath neces-



sary to sensitize a sheet of albumen paper, and of the gold bath necessary to tone it. If with a gold toning bath of ordinary strength, there were no further supply of the metal than that furnished to the paper by merely once wetting it with the toning solution, there would be but very little toning action. By moving the print in the dilute bath, however, fresh portions of unexhausted gold solution are brought into contact with the parts of the image where more deposit of metal is required, and so, as is well known, a bath relatively very weak is all that is wanted for toning purposes.

A more important point gained by the use of platinum as a developing agent only is, that by this method the metal is, as pointed out by Willis, presented to the paper not only in weak solution, but for only the shortest possible period of time. Thus the danger of the formation of any platinum compound, which, by remaining in the paper, might endanger the purity and stability of the whites, is reduced to a minimum, and may indeed be considered as absent.

Among other advantages claimed for this method of working are the facilities for obtaining definite variations of vigour and tone to suit certain classes of work, both by specified differences of treatment of the paper, and by variations in the constituents of the platinum developing solution itself.

### DELETERIOUS MOUNTS.

#### JUDGMENT IN DOWNES v. FALLOWFIELD.

THIS case came on for judgment on Monday last, before Mr. Justice Manisty, when he gave judgment for plaintiff for £27 17s. 3d., with costs on the High Court scale.

The following is an extract from the Referee's report:—

In pursuance of an order herein dated Nov. 12th, 1887, I, Edward Ridley, Official Referee, do hereby report to the Hon. Mr. Justice Manisty that the plaintiff is entitled to recover from the defendant the sum of £27 17s. 3d., made up as follows:—

Price of mounts, June, 1884...	...	£6 5 0
" " Nov., 1885...	...	2 4 0
Costs of re-printing—		
81 doz. cartes at 1s. 6d. ...	...	6 1 6
41 doz. vignettes at 1s. 9d. ...	...	3 11 9
74 doz. cabinets at 2s. 6d. ...	...	9 5 0
Costs of correspondence ...	...	0 10 0
		£27 17 3

And I further report that the plaintiff further contended that he was entitled to recover from the defendant damages in respect of general injury to his business caused by defendant's breach of contract, in respect of which this action was brought, and that I disallowed the whole of such claim; but at the request of the plaintiff I report that if such damages were recoverable it would be reasonable to assess the same at the sum of £50.

### IVES' RESEARCHES ON HELIOCHROMY.

In our last we published the paper of Fred E. Ives, which was read on Wednesday, November 21st, at a meeting of the Franklin Institute. But since the reading of the paper, the author has revised the matter for publication in order to make his intentions somewhat clearer.

The revision affects mainly the final part of the paper, and commencing with the fifth line of the second column of our page 790, the revised paper reads as follows:—

I did not do this at once, but after experimenting with several sets of reproduction pigments, adjusting colour-screens so that I could make the process counterfeit the spectrum with either set of pigments, I finally adopted reproduction colours which call for negatives of the spectrum showing curves of intensity approximating to the curves in Maxwell's diagram, illustrating the action of the spectrum upon the different sets of nerve fibrils. These reproduction colours are certain shades of red, green, and blue light, or their complementary colours in pigments, which approximate to Prussian blue, magenta red, and

aniline yellow, the first two of so light a shade that it is necessary to superimpose one upon the other to obtain a full violet blue, the blue upon the yellow to obtain green, and the magenta upon yellow to obtain red.

When I made my first communication upon the subject, I assumed, with Helmholtz, that there might be some latitude in the selection of type (reproduction) colours, and therefore did not commit myself to the use of any particular ones, but merely showed how I would produce at will negatives of the spectrum having any curves of intensity that might be required in order to secure the proper distribution of such colours or pigments as were selected. The adoption of reproduction colours corresponding to what are now recognized to be the primary colour sensations has made it possible for me to state more definitely my mode of procedure, as above.

What I claim as new and original in my method is (1) the production of heliochromic negatives by exposing colour-sensitive plates through compound colour-screens, which have been adjusted to secure negatives showing curves of intensity which bear a certain definite relation to the colours employed to produce the heliochromic pictures, and (2) the production of heliochromic negatives by a procedure calculated to yield negatives of the spectrum showing curves of intensity which probably correspond to the action of the spectrum upon the sets of nerve fibrils.

Admitting the theoretical soundness of my mode of procedure, which, I believe, I have fairly demonstrated, there remains only the question of practicability and commercial value to be considered. The process is practicable, if the same operations, repeated in the same manner, can be relied upon to produce pictures which counterfeit the light and shade and colour of all objects. Three subjects which I shall show to-night—a delicate oil-painting, a brilliant Prang chromo, and a beautiful sea-shell—were made with the same light, same camera, same preparation of sensitive plates, same set of colour screens, same relative exposures, and same development. They show a very great variety of colours, mostly compound in the painting and chromo, but pure spectrum colours in the seashell; yet the colours of all are alike faithfully counterfeited to the eye. Although there should be no question of the fact, I will here state that these finished results have been obtained without any retouching or artificial manipulation whatever.

### THE LICK OBSERVATORY.

THE astronomers never tire of expatiating on the excellence of the mounting of the great telescope. In most essential points the mounting is regarded as unsurpassed, and in its constant use the astronomers have already had reason to congratulate themselves on the advances made in the details of such structures since the time that Herschel and Rosse began their experiments in this direction. The adjustment is so perfect that little effort is required for necessary changes in position. A pressure of ten pounds on a hand-wheel at the top of the great pier moves the whole telescope quickly in right ascension, and for the corresponding motion in declination about twice that pressure is sufficient. In right ascension movements over 23,000 pounds are moved, and in declination over 14,500. A less pressure, it is noted, is required for the greater weight; this is due to the comparative difficulty in reaching, through angles, &c., the declination axis. The entire telescope and mounting weighs 81,520 pounds.

All the astronomers are delighted with the twelve-inch equatorial telescope. Director Holden considers it one of the most perfect instruments in the world. It was formerly owned by Dr. Henry Draper, of New York. Mr. Barnard, who has this glass in charge, has shown by a series of experiments that this is capable of producing photographs of exquisite sharpness. This is regarded as an unexpected endowment for the observatory—a new instrument of great excellence for photographic purposes. There is, of course, besides this, the large 35-inch photographic lens for the large telescope. In making the 12-inch equatorial of value for photographic purposes, it is calculated that Mr. Barnard has increased the value of the observatory's equipment by fully \$5,000.

In photographic work there has been excellent results. In the long focus of 49 feet of the large equatorial, the images are so represented that the moon appears more than five inches across. It is easy to enlarge these views from six to ten times, so that portions of the moon can be seen on a scale that would



make the moon's diameter in proportion fully fifty inches. Exposures are practically instantaneous in the bright objects, such as the moon and larger stars, but for the fainter stars exposures of one or two hours are often necessary. The stars in their courses must be followed at these times, and for this purpose provision has been made for attaching the twelve-inch telescope alongside the larger one to serve as a pointing telescope. This attachment can be arranged easily without delay.—*San Francisco Bulletin*.

### ON THE MEASUREMENT OF THE SENSITIVENESS OF SILVER SALTS TO THE SPECTRUM.

BY CAPTAIN W. DE W. ABNEY, C.B., R.E., F.R.S.\*

We are accustomed to see curves of the photographic action of light shown graphically, and it will be found that these curves are founded on the density of the deposit, and not on the photographic intensity of the light producing it. That this gives an erroneous idea of the relative action at the different parts of the spectrum is well seen in the accompanying diagram, showing the density of deposit caused by the spectrum on an

erythrosin dyed bromide plate and on a bromo-iodide plate, and the absolute value of the photographic action of different rays as ascertained by the method just described.

Tables II. and III. give the measurements and readings:—

TABLE I.

Seconds of Exposure.	(BrI) Curve I.	(Br) Curve II.	(BrI) Curve III.	(Br) Curve IV.	(BrI) Curve V.
5	83	76	71	71	55
10	67	62	57	53	34
15	57	51	46	41	25
20	48	42	38	33.5	20.5
30	36.5	31	28.5	26	15
40	30	25.5	23	21.5	12.5
50	26	22	19.5	18	10
60	23	20	17.5	15	8
80	20	17.5	14.5	11	6
100	18.5	15.5	12	8	5
120	17	14.5	10	5.5	5

Fig. 4.

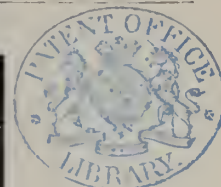
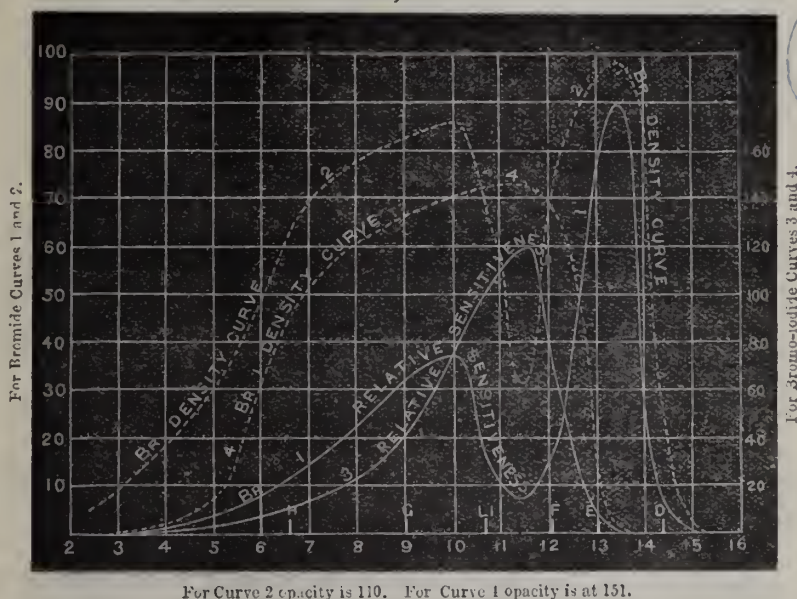


TABLE II.

Gelatine Plate, Bromide of Silver, stained with Erythrosin. Exposure to Gaslight.

Scale No.	Sector Reading.	Opacity.	Relative Sensitiveness.	Scale.	
				Time of Exposure.	Sector Reading.
Bare glass	110	0	0	0	110
4	100	10	1	5	69
5	80	30	4	10	53
6	59	51	7.5	15	43
7	39	71	17	20	35
8	33	77	23	30	24
9	27	83	13	40	24
10	25.5	84.5	37	50	20.5
10½	35	75	30	60	18
11	53	57	21	80	14.25
11½	59	51	7.5	90	13
12	44	66	14	100	12
12½	25.5	84.5	37	120	107.5
13	15	95	74		
13½	13	97	90		
14	35	75	21		
14½	86	24	6		
15	108	2	.5		

TABLE III.

Gelatine Plate, Bromo-iodide of Silver. Exposure to Gaslight.

Scale No.	Sector Reading.	Opacity.	Relative Sensitiveness.	Scale.	
				Time of Exposure.	Sector Reading.
Bare glass	151	0	—	0	151
4	147	4	1	7	102
5	141	10	1.5	10	75
6	91	60	2	20	39
7	51	109	15	30	27
8	29	122	26	40	17.5
9	18	133	40	50	15
10	9.5	141.5	73	60	12
11	5.5	145.5	110	70	10
11½	5	146	120	80	8.5
12	9	142	77	90	7
1½	27	124	27		
13	126	25	2.5		

The necessity of developing a scale of density on the same plate is shown by fig. 3, from which will be seen the variation in density of deposit which occurs. Curves I, III, and V are from plates of the same batch as are curves II and IV. In these curves the value of "no deposit" on the plate is made 100.

\* Continued from page 791.



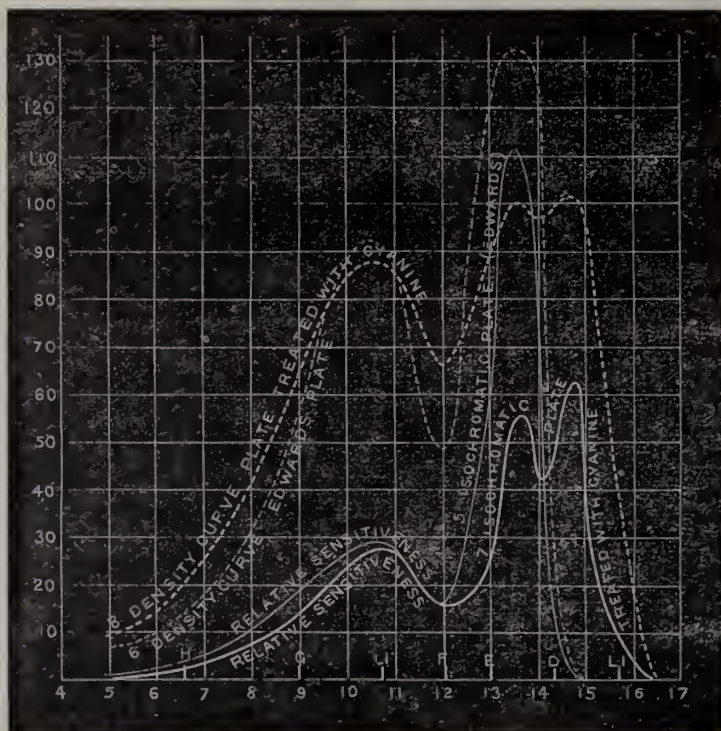
In the original measures the alteration in the reflected light of the measuring machine made the highest value of no deposit 186, and the lowest 96. The other values of the curves were calculated from the originally plotted curve, and are shown in Table I. This alteration in curvature is due, no doubt, to the

slight alteration in the developer, together with a difference in the time during which the plate is under its influence.

I will now show you other curves which I have measured, and some of them will be found of more than usual interest.

For instance, in Edwards' isochromatic plates it will be seen

Fig. 5.

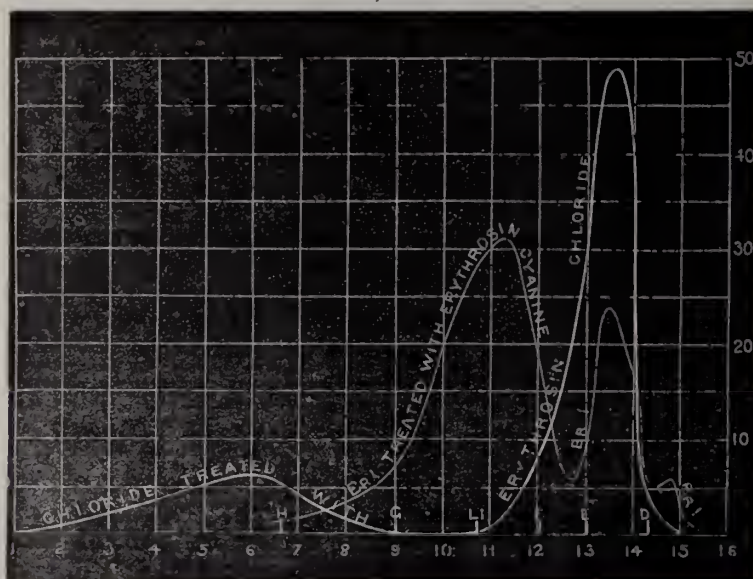


For Curve 6 opacity is at 138. For Curve 8 opacity is at 100.

that the maximum of the "extra-ordinary" sensitiveness lies in the green of the spectrum. If one of these plates, however, be treated with a solution of cyanine and be then exposed, there is

a lowering of sensitiveness in the green; but a large increase in the orange and right into the red. I have not obtained the same effects by simply using a mixture of eosine and cyanine, or erthro-

Fig. 6.



sine and cyanine; but by treating a plate first with eosine or erythrosine, drying it, and then treating with cyanine, very much the same results have been obtained. One of the diagrams in fig. 6 shows the sensitiveness of the two dyes

mixed first of all and applied together. It will be noticed how inferior the action of the red is in this case to that just referred to.

(To be continued.)





## BREACH OF AGREEMENT BY A PHOTOGRAPHIC TRAVELLER.

## THE CLUB BUSINESS.

In the City of London Court, before Mr. Comr. Kerr, the case of *Taylor v. Vernon* (this vol. p. 722) was again mentioned. It will be remembered that the defendant, Mr. Henry Vernon, was formerly a traveller in the employment of the plaintiffs, Messrs. A. & G. Taylor, Photographers, of Queen Victoria Street, E.C., and elsewhere, but that he was now carrying on business in Brighton on his own account. Messrs. Taylor commenced proceedings in the City of London Court against Mr. Vernon to recover certain monies alleged to be due under an agreement which they entered into with him, by which he acted as their traveller. He denied his liability, and then the learned President of the Court non-suited the plaintiffs. They, however, instituted further proceedings, and in the second action sought to recover the payment of £4 8s. 11d. due, as they said, under the terms of contract. As the matter seemed likely to be one of account, all questions in difference were referred to arbitration. The learned Arbitrator (Mr. Charles Quilter) held a sitting, when the whole question in dispute between the parties was gone into at great length. Mr. E. B. Tattershall appeared for the plaintiffs, and the defendant conducted his own case in person. The evidence possessed a considerable amount of interest to photographers.

Mr. George Taylor, one of the plaintiffs, attended to give evidence in support of the claim, which was for money overpaid to the defendant, which he had drawn on account when he brought various orders for photographs in. In October he saw the defendant about the matter, and then he acknowledged the debt and offered a sum of money in order to meet the matter, which, however, was not paid. The defendant was an ordinary canvasser, and his remuneration was at the rate of five shillings for every thirty shilling order he obtained, the commission to be paid when the customer paid the second instalment of one shilling. The defendant drew various amounts on account from time to time, and it was owing to the overcharge that these proceedings were brought. The defendant, in cross-examining the witness, desired a receipt dated September 18, 1886, to be produced for £17 9s. 6d., which was for cash advanced on account of commission. Mr. Taylor said he had no such document.

The manager of the plaintiffs' Ludgate Hill branch (Mr. Wm. Barnaby) deposed to making the arrangement with the defendant to canvass for Messrs. Taylor, and he was to be paid 5s. on every 30s. order. A special arrangement was made under special circumstances. It was not customary for them to allow canvassers to draw money on account, as Mr. Vernon had done. When the canvasser secured an order from a customer, he kept the first shilling he received. They had paid the defendant £17 9s. 6d. in addition to those first shillings. So he had had 63s., making £3 3s. in addition to the £17 9s. 6d. He had seen the defendant, and he did not dispute the figures. In cross-examination, the witness said they paid the commission when the second 1s. had been paid by the customer, but it was conditional upon the 5s. which the canvasser drew being covered—that was upon the order turning out a good one and not a bad one.

Mr. Edward W. Rock knew all about these matters. He was once a clerk at the Ludgate Hill branch of plaintiffs' establishment. The terms under which defendant was engaged were quite of the ordinary nature, no special arrangement being made. At first he said the defendant was entitled to his commission of 5s. on the second shilling being paid, which was the whole of defendant's case, but this he afterwards qualified by saying it was on condition the 5s. was "covered." The defendant was a canvasser, he said, in cross-examination, and not a district collector.

Mr. John Lee, collector for plaintiffs, who inspected all the orders which were brought in by the various canvassers, testified to going into the neighbourhood where the defendant had obtained the orders, and collected the money due on them. He paid all the money he received into the firm. Some of the orders the defendant got were bad, while others were good. The account which had been delivered distinguished the bad orders from the good.

This was the case for the plaintiffs.

The defendant gave evidence in support of his contention that he had not been paid anything more than was due to him, or more than he was entitled to. When the customer paid the second instalment of 1s., he was entitled to receive his commission of 5s. on 30s. orders. In all, he had had £17 9s. 6d., and this he

had accounted for by the orders sent in. He produced a long list of orders, on which he claimed to be entitled to 5s. when the second shilling was paid. His commission was due whether the customer completed the payments or not. He kept no books.

Edward D. Mitchell, formerly a canvasser in the service of the plaintiffs, but who is now one of the great unemployed, pledged his oath to always receiving commissions from the plaintiffs when the second 1s. was paid. He was questioned as to whether he had received the commission on any of the orders where they were bad, but to this he replied that he really did not know. He received his commission on all the orders; he did not know if any of them were bad. It did not concern him; he got his money, and that was everything.

The learned Arbitrator's award was in favour of the plaintiff for the full amount claimed, and all costs including his fee.

Mr. Tattershall now applied that the award should be made an award of Court.

As there was no objection offered on the other side, the award was made an award of Court, and judgment entered for the plaintiff for the full amount with costs.

## LIGHTING IN THE PHOTOGRAPHIC STUDIO.

BY C. P. I. DUCHOCHOIS.\*

## III.

In a portrait, the head is, of course, the principal subject. It should, therefore, be the centre of illumination, and every other part should not equal it in brightness. That is not to say that the face should be strongly lighted in the studio—which in photography would inevitably destroy the half-lights or details in the light—but that it should be so comparatively, the lights being sustained by well managed shadows to give relief, brilliancy, and power to the picture.

For the treatment of light *à la* Rembrandt, one should avoid falling into exaggeration. We too often see portraits so lighted, which are nothing but white and black patches, without half-lights and half-darks to connect the high lights to the deep shadows, all being devoid of penumbra to soften the whole. The opposite fault is also common, the picture being deficient in contrasts and insipid by its evenness.

The artifices which should be employed to regulate the lighting in the studio will be explained and illustrated further on. At present we give rules and advices to artistically light the picture.

When the lighting is wholly composed of lights and half-lights, the darks and half-darks appear with advantage with great vigour. Hence, if we place the model in the shade, the greatest light falling on the secondary objects around the figure stands well out, but, being in the half-dark, it should be received by half-lights and darks, else the whole is crude. This composition is seldom used for portraits. In genre and landscape pictures it is quite effective. The opposite lighting—that is to say, composing the picture with lights and half-lights, and relieving the whole—is well adapted to portraiture.

Most brilliant effects are produced by opposing light to dark, and *vice versa*; for example, by placing the lighted part of the subject on a dark ground, and the shadow part on a light ground. This artifice, recommended by Leonardo da Vinci, is generally employed by painters, and to it is due in a certain measure the striking effects observed in their works.

By such an arrangement the light appears brighter, the dark darker, and the whole, being well balanced, acquires great vigour. It is specially recommended to photographers; moreover, it permits of projecting on the face a subdued light, or to soften the direct light by certain means which we will explain, in order to preserve all the half-tints or models without losing anything of the general effect.

The dark parts of the picture should be contrasted by still darker shadows or by half-darks, in order to well define them; and as the lights should be relieved by shadows, so should the masses of shadows be relieved by repeating the lights, but subdued, not as bright as the principal one, which, as we said before, no other should equal.

When the lights are opposed to half-lights, the darks to half-darks, breadth, softness, harmony is the result, but the whole becomes insipid if not relieved by opposing stronger lights or darker shadows in some parts of the picture.

We have just said that the shadows appear so much darker as the light in opposition is brighter. This, which to the photo-

\* Continued from page 786.



grapher is of great importance, because the same effect will be produced on the negative, we will have occasion to practically demonstrate, and to show how the details in the shadows, apparently obliterated when a strong light and a shadow are placed side by side, can be rendered visible by a proper regulation of the light.

To give air, distance, relief to a group, to a standing or sitting figure, the subject—i.e., the centre of illumination—should be relieved by the ground, and the secondary objects or accessories placed in the half-light or half-dark. This arrangement will be more effective if the foreground is kept in the shade.

As is seen, there is always in a picture a certain part of the whole—the subject in a portrait—which stands predominant. "It is necessary," says Sir Joshua Reynolds, "that some part, though a small one is sufficient, should be sharp and cutting against the ground, whether it be light on dark, or dark on light ground, in order to give firmness and distinctness to the work; if, on the other hand, it is relieved on every side, it will appear as if inlaid on its ground."

#### IV.

To resume: A picture is made of light and dark blended with intermediate tints, i.e., half light and half dark. Nothing is white in the face; all is more or less shaded, with touches of black in the most receding parts, and luminous touches on the predominant parts, as it appears in nature on the eyebrows, the nose, the chin, &c. The part of the face nearest to the light should be the most lighted, with gradation to dark in the most distant part.

There must be one light only illuminating the whole picture. In a portrait, it is that which falls on the head. Every light should have a focus or centre of illumination brighter than the rest of the light. In a portrait, the foci are on the predominant parts of the face, as above mentioned. No light, no shade, exists in nature without gradation.

The shadows should not be vertical or horizontal, which is unnatural, of a bad effect, inartistic. Hence, whatever be the lighting, the light should fall at a certain angle on the model, and be repeated on the background, but inversely, to produce effect by opposition of light and dark.

A picture wholly composed of lights and half-lights, darks and half-darks, appears weak, insipid, without character. If it consists of lights and darks finishing abruptly—i.e., without being blended by half-tints—it looks spotted, unfinished, and can be effective only when viewed at a certain distance. This manner is employed in decoration; in photography it is insupportable.

The illumination of the face being the subject, every other light should be subordinate to it, and no light should surpass or equal it in brightness. The principal light should be repeated, not too often, nor by giving to the repetition the same importance, in order to break the evenness and give variety and colour to the whole picture. This rule holds good in regard to the shadows. In groups, the repetitions are indispensable.

Melting the draperies or the accessories into nothingness in the dark is objectionable as a rule, but is sometimes resorted to for effects. Without sacrificing anything, vigour and brilliancy can be obtained by opposition of still darker shadows to define the outlines. The shadows must be transparent and show the objects upon which they are projected, otherwise they look flat, heavy, unnatural. By opposing light to dark, dark to light, relief, brilliancy, and effect are produced.

Lastly, it is most important to distribute the light according to the features of the sitter, to preserve their originality.

(To be continued.)

### SUBSTITUTES FOR GLASS.

BY JNO. CARBUTT.\*

No sooner had the gelatine dry plate process become established, displacing by its greater sensitiveness and convenience the old wet and dry collodion method, than experiments were commenced to find a suitable substitute for glass, the weight of which has proved a great inconvenience to travellers, with the dread always present that their exposed plates or negatives might get broken, a dread, in many instances only too painfully realised. Before proceeding to describe the material I have found to be a perfect substitute for glass as used in photography, I will briefly pass in review a few of the substitutes suggested and made use of, and note the objections to them.

In 1880, M. Ferrier, of Paris, patented a compound film of

gelatine and collodion. The objection to this film was the unequal expansion of the gelatine and collodion, causing the latter to crack.

H. J. Palmer, M.A., of Liverpool, in 1881, proposed a film of gelatine and ox-gall, with a second film of plain gelatine.

Stebbing, of Paris, produced gelatine bromide films on a pellicle of gelatine. Both this and the Palmer film proved defective from the liability of the film to expand while in the developing solution, sometimes to nearly double the area of the dry film.

Warnerke, of London, produced films of alternate layers of rubber and collodion.

Pumphrey, of Birmingham, as early as 1882, produced films on paper.

Morgan and Kidd, of London, coated paper for bromide enlargements, and the same was used for paper negatives, but the grain of the paper proved objectionable.

The late Walter B. Woodbury devoted a great deal of time in trying to produce a transparent paper as a support when death overtook him. His partner, Vergara, took it up, and finally placed such films on the market, only to be shortly withdrawn, to be replaced by a film of hardened gelatine, the invention of F. C. Froedman, of Dublin. His method consists in mixing bichromate of potash with gelatine, spreading on glass, drying, exposing to light, washing in plain water, then bleaching in a dilute solution of sulphurous acid, again washing, drying and coating with sensitive emulsion. The objection to this film is its extreme limpness when wet, and propensity to assume any shape but a flat one on drying. These were followed in America by the Eastman Company's paper negative, made translucent with castor-oil, and while printing quicker than paper uncoiled, the objectionable grain of the paper marred the result.

Next we have the stripping film of the same company, which up to the present time has proved the best substitute for glass, although in many instances the grain of the paper shows in the finished negative. The objection made by users of this material is the great risk of loss of negatives in the after-process of stripping the exposed film from its paper support, and the time occupied in the same. I will read from their instructions as published in "Science of Photography," Vol. I., pp. 11, 12:—

"Stripping.—Take as many sheets of glass as you have negatives to strip, each one a size larger than the negatives. Clean, and when dry coat with a rubber solution, which can be either bought already prepared, or can be made as follows:—

Rubber cement	...	...	...	...	1 ounce
Benzine	...	...	...	...	9 ounces

"Place the plates in a rack to dry until 'dead,' which will take about five minutes. Then flow with the following solution:—

#### "Plain Collodion.—

Ether	...	...	...	...	1 ounce
Alcohol	...	...	...	...	1 "
Gyn-cotton	...	...	...	...	10 grs.

"As soon as set, wash under the tap until the greasy lines disappear. This is to remove the ether and alcohol. Then place the glass in a tray half full of cold water, keeping hold of one end with the left hand. Put the negative into the dish face down, press under the water, and guide the end nearest the hand holding the glass, so as to clasp the negative with that hand, then raise the end of the plate out of the water, thus allowing the water to carry the air from under the negative. Squeegee the negative down, which should be done with light pressure for the first few strokes, and then put it under blotting-paper with another sheet of glass over that, and a weight of say eight or ten pounds on it. Allow it to remain under pressure for ten minutes. Now take a tray half filled with warm water at a temperature of about 110° F., or such as will feel comfortable to the hands. The directions sent out with the films, saying to use water at 120° to 140°, I have found to be much too hot.

"Place the glass plate with the negative thereon into the warm water, and, after gently rocking a couple of minutes, try one corner by picking it up with finger-nail or a pin. If it does not start readily, do not try to hasten it, for as soon as the water has softened the substratum, the paper will come off easily. After the paper is removed, raise the plate from the water, wash off the remaining soft gelatine with a tuft of cotton or camel-hair brush dipped in warm water, and set the plate in a rack to cool. Do not change from the warm water to the cold too quickly, as a sudden change of temperature will frill the gelatine.

\* A Communication to the American Institute.



"After the negative is cool, place it in a pan of cold water, holding the fingers under one end of the plate. Take a gelatine skin and slide into the water, smooth side down. Clasp the end of the skin with the hand holding the glass, and with the other hand press the skin under the water. As soon as the skin is immersed, raise the end of the plate slowly, which allows the water to carry the air from between the skin and negative.

"In placing the skin on the negative do not allow it to remain in the water more than thirty seconds or a minute, as the water will soak out the glycerine, and the skin when dry will become brittle. To avoid this tendency it is well to put about ten per cent. of glycerine into the water used for that purpose, or perhaps better yet is a solution of equal parts of wood, alcohol, and water, which may be kept in a bottle and used from time to time.

"With a wet squeegee go over the skin carefully until all the wrinkles are removed, when allow the negative to dry thoroughly, and flow with plain collodion. As soon as this is dry, cut around the edge and peel from the glass. The rubber adhering can be removed with a tuft of cotton dipped in benzine.

"The negative when completed has a coating of collodion on both sides. This forms a protection against moisture, and gives the negative greater flexibility. I am frequently asked, are the films quick enough for instantaneous work? In reply, I say, most assuredly yes. A short time ago I made some 8 by 10 negatives of the New York and Philadelphia Express, going at the rate of forty miles an hour. I was on the shadow side, but the negatives were fully timed and showed remarkable detail in the deepest shadows. The train was perfectly sharp, and the driving rod of the engine plain and distinct.

"For interiors, or any work where halation is liable to occur, films are vastly superior to any glass plates, as they do not show halation. I have many negatives giving unquestionable proof of this."

The substance I have the honour to bring to your notice to-night is thin sheet celluloid, manufactured by the Celluloid Manufacturing Company, of Newark, N. J.

It is some three or four years since I first examined into this material, but the manufacturers had not then perfected the finish of it to render it available, and it is only during this year that it has been produced uniform in thickness and finish, and I am now using at my factory large quantities of sheet celluloid one-hundredth of an inch in thickness, coated with the same emulsion as used on glass, forming flexible negative films, the most complete and perfect substitute for glass I believe yet discovered on which to make negatives and positives, and without a single objection belonging to the substances previously enumerated.

Its weight, as compared with glass, is as follows:—Twenty-four 5 by 8 flexible films weigh seven and one-half ounces, while twenty-four 5 by 8 glass dry plates weigh from 110 to 120 ounces, and its great merit does not alone lay in its lightness, toughness, and flexibility, but in that its treatment in development, &c., is precisely that of a glass plate, there is absolutely no after-process required. When the negative is washed it is hung up by a spring clip to dry, and is then ready to be printed from, and, owing to its thinness, can be printed from the reverse side, if the precaution is taken to use only vertical rays.

Makers of photographic apparatus are already producing light-weight holders to carry these films, and I have no doubt magazine holders will be produced in which thirty to fifty films can be carried and exposed.

I have here an old changing-box I used twenty years ago, that, by a simple device to hold the films in and allow of changing from box to holder, I can carry eighteen films.

I have here several negatives made on the films, and prints from them, that members can examine at the close of the meeting.

I will now show on the screen lantern transparencies from film negatives, both contact and reduced in the camera.

### Notes.

We have to record the death of Edward Anthony, senior member of the large American photographic firm, E. and H. T. Anthony and Co., of New York. Like his late partner, H. T. Anthony, the deceased gentleman did

much towards the development of photography in the United States, while his genial and obliging personality contributed towards giving his firm the leading position they hold. He died on the 14th instant, aged seventy.

Among the almanacs we may mention one from McGhie and Bolton, of Glasgow, neatly printed in gold on a deep chocolate cabinet mount. It is an excellent specimen of gold leaf printing.

Our YEAR-BOOK for 1889 has now been some days before the readers, and we do not think its contents will be found less useful than the matter of previous issues. The frontispiece illustration is a fine specimen of animal photography by Thomas Fall, the photograph being reproduced by the method of clear margin printing recently introduced by the Woodburytype Company.

Of all the pursuits which are popularly supposed to bring those who pursue them to Hanwell or Colney Hatch, the writing of mottoes for Christmas crackers, and of verses for Christmas cards, is understood to most rapidly land their ill-starred composers in the comparative seclusion of the padded cell. And as though the composition of the ordinary Christmas card poetry were not sufficiently destructive of brain matter, we notice that this season it has occurred to some fiendish publisher to produce what may be called "Christmas Specialities," in the shape of a series of cards specially intended for the members of various trades and professions, with verses to match. The very thought is maddening; and we can readily imagine the Christmas-card poet, who a week or two of this kind of writing had wellnigh made eligible for Earlswood, finding his last straw in the shape of a peremptory order from his publisher to send by return a dozen (13 for 12) assorted verses to be printed on Christmas cards specially intended for, let us say, jobbing photographers, or dealers in photographic accessories. Possibly before tottering reason had quite forsaken her throne, the long-suffering poet would have produced something of this kind:—

*To a Successful Photographer.*

Dear Friend,—Whilst you pass a glad Christmas,  
And a New Year sufficiently bright,  
May each pair of your excellent negatives  
Prove a "positive" source of delight!

*Verse to Accompany a Picture of a Willow-pattern Plate.*

The plate upon this Christmas card  
Shows that my love is true,  
And it was never meant to be  
A mere "dry-plate" for you!

*To be sent with a Christmas Carte-de-visite.*

There's room for you, dear, in the carte,  
And once in it together,  
We'd drive through life in it, sweetheart,  
Whatever were the weather!

It is always interesting to read something about photography in the *Detroit Free Press*. Our contemporary occasionally makes some wonderful discoveries which, if difficult to accept, are certainly refreshing. The latest



theory propounded as to the theatrical professional beauty is that the woman who photographs best is the one who knows most about the operation and its requirements. The photographer in such cases is nowhere, and the best thing he can do is to "humbly follow her suggestions." Among other items of information we are told that Miss Neilson always retouched her own negatives, that Miss Ada Rehan photographs so much better than she did five years ago because "it is the arrangement of the light she has learned to attend to," that Fanny Davenport had been "taking dreadful looking pictures" for several years until she began acting *La Tosca*, and then she realised that something must be done, and she gave her mind to getting some good pictures. This process of "giving her mind" must have been a severe ordeal to Fanny, for we are informed that out of half a hundred sittings, only half a dozen pictures pleased her, and she insisted on breaking all the other negatives. Miss Detchon owes all the peculiar qualities in her photographs to herself, and not to the photographer; while Rose Coghlan has determined to follow this example by experimenting in country galleries.

From time to time we have heard of strange suggestions as to the outward form which might be given to the detective camera, and when we suggested the "Soda and Brandy Glass Camera" in a recent issue, we certainly thought the climax had been reached; but if a paragraph in the *Star* of last Tuesday is to be relied upon, truth has outdone fiction, and the "Perambulator and Baby Camera" is actually a part of the existing equipment of the German war department.

Speaking of a German officer who recently occupied a chalet near Paris, and who has just been expelled from France as a spy, the *Star* says: "A lady, who was supposed to have taken a part of the chalet from him, turns out to have been a German military cadet. They both used to go wandering about with a perambulator. What seemed to be a sleeping baby was in reality a large doll that hid a photographic apparatus for taking views of the new forts and the positions commanding them."

A rack-and-pinion arrangement, which can be put in gear and out by a touch, is one notable characteristic of well-designed enlarging and projection apparatus, which was shown us the other day at the works of Perken, Son, and Rayment, of Hatton Garden, and the same kind of arrangement should be very useful as applied to cameras of all sorts.

To put the pinion out of gear with the rack, the milled head is pushed inwards, so that a part of the pinion shaft which has been denuded of the leaves falls opposite the rack, as shown in fig. 1. The sliding part of the apparatus can now be readily and rapidly drawn in or out to the approximate position, and the rack is brought again into gear with the pinion by drawing the milled head outwards, as shown in fig. 2. This application to enlarging

apparatus and cameras forms, we understand, a feature

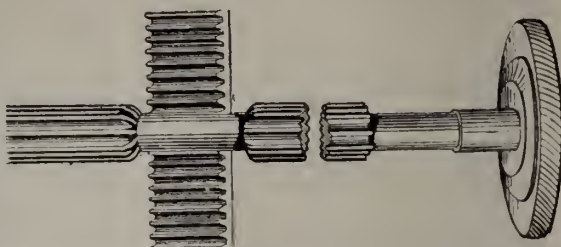


Fig. 1.

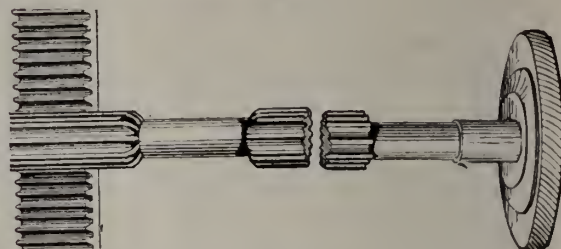
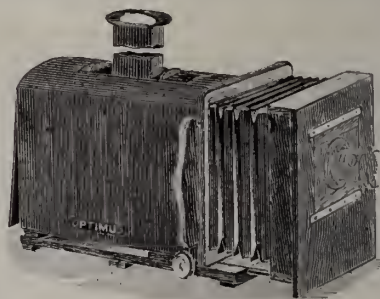


Fig. 2.

in a patent which is being obtained by Perken and Co.

The enlarging apparatus to which we refer is represented by the subjoined cut, and owing to its convenient con-



struction will probably be extensively used for enlarging and projection. The condensers are 6 inches in diameter, so as to allow of the exhibition of a 5 by 4 transparency—or the best part of a half-plate—a consideration to amateurs who work on these sizes and wish to exhibit direct transparencies made by contact.

While referring to the above, we may call attention to the extensive optical and metal works that Perken, Son, and Rayment have established in Hatton Garden, and their photographic cabinet factory in Saffron Hill. At the former we were much interested in the glass-grinding departments—one for photographic lenses, another for spectacles; and we were surprised to find in London such extensive workshops for the metal parts of cameras and optical lanterns; indeed, we thought that outside Birmingham we should not find such workshops in the United Kingdom. The cabinet works in Saffron Hill also interested us much; the arrangement of the machine tools, and distribution of power on the several floors, being admirable. In both factories we were struck by the cheerful aspect of the



craftsfolk employed; while the remarks passing between one of the partners who acted as our guide and those at work, indicated more community of feeling than is usual between the employers and workers of London.

The authorities at the New York School of Mines appear to have a different opinion as to the value of photography in architecture from that entertained by Professor Roger Smith, whose remarks in a paper read at the University College we quoted last week. One of the trustees, at his own expense, has provided the School with a collection of books and photographs such as no other possesses. The difficulty was how to make the students use them. One of the professors, in a paper he recently read at Columbia College, candidly confessed that the better he made his lectures upon architectural history, the less inclination the students found for studying the seven hundred books and twelve thousand photographs, which thus stood neglected on the shelves. The only cure seemed to be was to lecture as badly as he knew how. He therefore reduced the number of lectures, and treated the subject in the most superficial manner. When the time for the examination drew near he divided the topics he had touched upon among the students, and gave them a month to study and write out the result of their studies. The effect was most satisfactory. Then the books and photographs were divided into a dozen parcels, one of which was assigned each week to each student to report upon. The next week they changed piles, and studied up and reported upon another topic. By the end of the twelfth week the twelve topics had been most thoroughly discussed; every student had been through every book and looked at every photograph, and the problem of bringing the collections into use found a triumphant solution. The experience of this professor is worth notice, because we believe that not nearly the use is made of photographs in scientific teaching which there might be. Hundreds of photographs have been made at South Kensington, but once made they are forgotten, simply because teachers have no system of enforcing their study upon students.

The career of the American *Daily Graphic* does not offer any encouragement to the idea which a good many people have that a daily illustrated paper would be a success in London. It is a curious notion that the advances which have been made of recent years in photography and in photo-zincography have rendered such an undertaking not only possible, but feasible. We suppose that the Americans are level with the age in most matters relating to printing and photography, and that if a daily illustrated paper could have been made a success, it would have met with that success in New York. Such, however, has not been the case. The originators of the project, Goodsell Brothers, now dead, ruined themselves in the attempt to make it a paying property; it has changed hands two or three times; and since its establishment half a million of dollars have been sunk in trying to keep it afloat. Its latest vicissitude is the sale in October last of the title and interest, the fixtures, presses, &c., or an execution for rent. The price paid was five thousand dollars, which by itself

would seem a ridiculously small sum. The purchasers, however, assume 50,000 dols. of debts in addition. The paper will be continued, and, it is said, in its present form.

## Patent Intelligence.

### Applications for Letters Patent.

18,026. WILLIAM CHANNING GIBBS and GEORGE WILLIAM DORNIN, 11, Wellington Street, Strand, London, W.C., for "Certain Improvements in Photographic Cameras."—[Complete Specification.]—Dec. 11, 1888.

18,054. JOHN ARMSTEAD HALHEAD, 139, Denton Street, Carlisle, Cumberland, for "A Metal Dark Slide with Metal Hinged Shutter and Automatic Fixing Recess for Plates for use with Cameras for Photographic Purposes."—December 11th, 1888.

18,066. GEORGE ISAAC FELDON, 57, Chancery Lane, London, W.C., for Improvements in Machinery or Apparatus for Coating Paper or other Fabric with Glue, Gum, Paste, or other Fluid or Semi-fluid Material."—December 11th, 1888.

Patents on which the Fifth Year's Renewal Fee has been Paid.

712 of 1884. F. HAZELDINE.—Washing Photographic Prints.

### Specifications Published.

405. ENOCH WOOD PERRY, junr., of 42, East 14th Street, New York City, United States of America, Artist, for "An Improved Support for Photographic Sensitive Films, or Surfaces."—Dated January 10th, 1888.

The Patentee says:—

The object of my invention is to provide a practical flexible photographic sensitive plate or ribbon, as a substitute for glass or other material heretofore used for photographic negatives; and to this end my invention consists of a sensitised thin and flexible sheet of transparent celluloid, xylonite, or other pyroxiline-camphor compound which can be rolled and used in long lengths, or in separate plates, or cut, bent, or moulded to any size or form, so as to print upon flat or spherical, or other than flat surfaces, and which will resist the action of the developing chemicals, and through which the photograph may be printed without removing the film or receiving any other manipulation than glass negatives.

Reference is to be had to the accompanying drawings\* forming a part of this specification, in which fig. 1 is a plan view of a long strip of my new photographic negative, the shade indicating the sensitised surface. Fig. 2 is an enlarged sectional elevation on line x—x of fig. 1; and fig. 3 is a sectional elevation of a camera, showing the preferred method of using my new negative. Similar letters of reference indicate corresponding parts in all the figures.

A represents a thin sheet of celluloid, xylonite, or other pyroxiline-camphor compound made in the usual manner, but without pigment, so that the sheet is transparent, or sufficiently so for photographic purposes. Upon one surface of the sheet A is spread a film B of gelatine, nitrate of silver, bromide, or other mixture or emulsion, sensitive to the action of light. The film B adheres to the sheet as to glass, and the sheet being transparent is a perfect substitute for glass as a photographic negative.

In use, it is my design to stretch the sensitised sheet in long lengths upon rollers, C C, the whole adapted to be placed in the camera. By means of the rollers I am enabled to stretch the sheet to properly receive the impression. By shifting the sheet, many impressions may be taken without removing the rollers or sheet from the camera. The exposed portions of the sheet may be cut into short lengths, and the negative developed, the same as if taken on glass, and after developing, the picture may be printed through the transparent sheet the same as if the film were mounted on glass.

The sheet A will not soften, or be in any manner unfavourably affected by the chemicals of the sensitive film or by the developing chemicals.

I am aware that celluloid has been used as a basis for hand painting, printing, and lithographing, but never as an article for actual photographic direct-camera negatives from which to print as with glass negatives.

\* Not reproduced, the text being clear without them.—Ed. P.N.



This negative possesses every merit of glass, with the additional advantages of less weight and bulk, impossibility of breakage, absence of fibre, its toughness, and the permanent results following the usual developing process; also its adaptability for use in continuous lengths or in separate sheets.

Having now particularly described and ascertained the nature of the said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. A photographic sensitive plate or ribbon, consisting of a sheet A of transparent celluloid or other pyroxyline compound, sensitized up on one surface with a photographic compound, substantially as described.

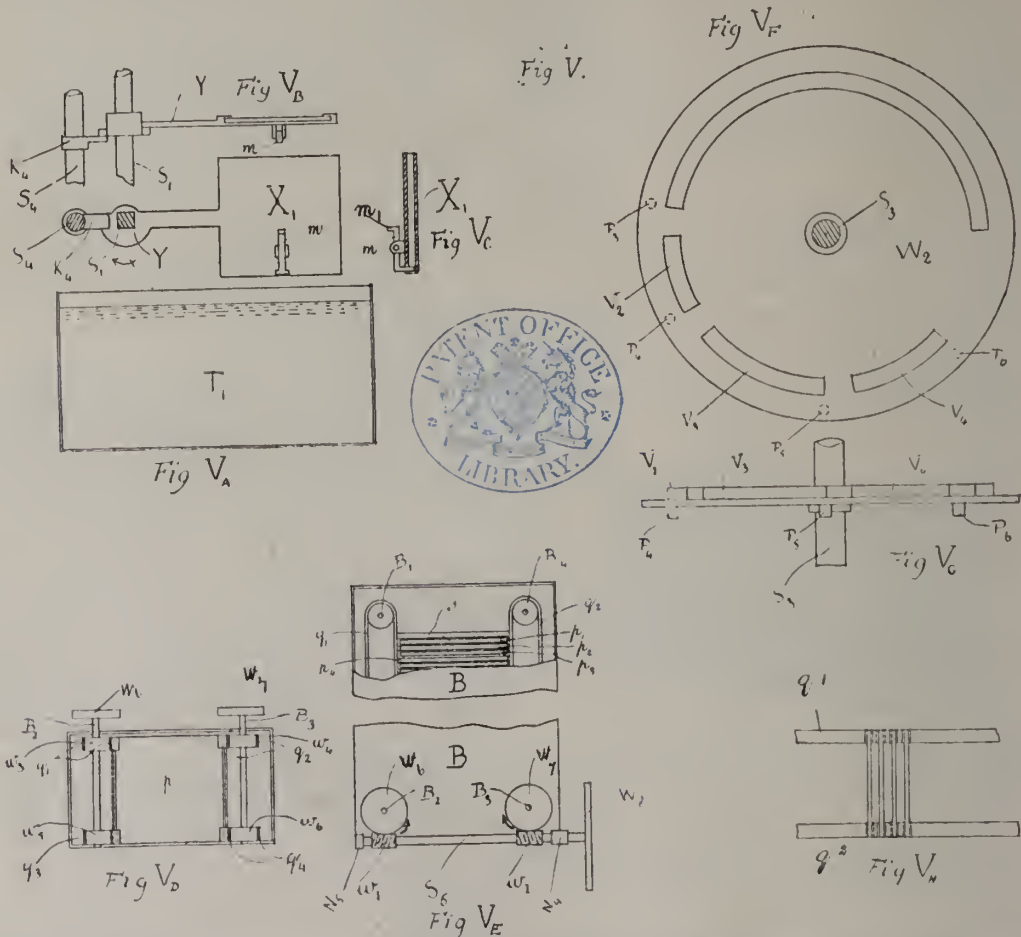
2. As a new article of manufacture, sensitized thin transparent and flexible sheets of celluloid, xylonite, or other pyroxyline compound, substantially as described.

3. The combination with a flexible and transparent sheet of celluloid or other pyroxyline compound, of a film of photographic sensitizing chemical, substantially as described.

16,136. EDWIN JENNINGS BALL, of 39, Aynhoe Road, Hammer-smith, W., in the County of Middlesex, Analytical Chemist, for "The Application of Photography to Automatic Sale and Delivery Machines, and the Utilisation of Automatic Sale and Delivery Machinery for the Production, Sale, and Delivery of Photographs.—Dated November 23rd.

(Continued from page 793.)

It will be seen that the stops  $K_1$ ,  $K_2$ , &c., the ratchet wheel  $R_1$ , the star wheel  $W_5$ , the pins  $P_1$ ,  $P_2$ , &c., and the block,  $V_1$ ,  $V_2$ ,  $V_3$ , and  $V_4$ , upon the front side of the wheel  $W_2$  are all arranged so as to correspond with the number of troughs into which it is



required to dip the plate. When the exposure wheel E is revolved it has been stated that power is taken from this wheel to actuate two catches  $K_1$ , figure 1, and  $K_2$ , figure 4, one of which releases the carrier Y, and the other releases a train of wheels  $W_2$ ,  $W_3$ , &c. The wheel  $W_2$  is provided with a weight attached to its circumference, and will revolve immediately the said catch  $K_1$ , gearing into wheel  $W_3$ , is released. The release of the catches  $K_1$  and  $K_2$  is effected in the following manner:—

Attached to the front standard G of the exposure wheel E is an arm which carries the bell-crank lever  $C_2$  on the fulcrum  $f_2$  (see figure 3). One arm of this lever rests on the periphery of the eccentric  $H_1$  attached to the shaft  $S_2$ . The other end of the lever  $C_2$  is attached to the connecting rod  $M_3$ , the further end of which is attached to the shaft  $S_3$ , whose end rests in the bearing  $G_3$ . It will be observed that if the exposure wheel E be now revolved in the direction of the arrow shown in figure 3, the eccentric  $H_1$  will raise the end of the bell-crank lever  $C_2$ , which,

by means of rod  $M_3$  and crank  $L_4$ , will rotate the shaft  $S_3$  through a portion of a revolution in the same direction. The lever  $C_2$  is shown in figures 2 and 3. To avoid complication in figure 1 the end of the connecting rod  $M_3$  is broken off, and the lever  $C_2$  is not shown. The shaft  $S_3$  is carried along underneath the trough-rest Z, and the other end carries a crank  $L_4$  (see figures 2 and 4), which is connected by means of the rod  $M_3$  to the bell-crank catch  $K_2$  (see figure 4). It will be noticed that if the shaft  $S_3$  moves in the same direction as  $W_2$ , which it will do owing to the eccentric  $H_1$ , the catch  $K_2$  will be thrown out of gear.

Next as regards  $K_1$ . Figures 6G and 6H show respectively side and front elevation, and figure 6K shows a plan of the catch  $K_1$ . Just inside the support (d) fixed to the shaft  $S_3$  is a crank  $L_5$ , connected by the rod  $N_4$  to the crank  $L_7$  on the shaft  $S_5$  swinging in bearings  $G_1$ ,  $G_3$  parallel to the shaft  $S_5$ . The shaft  $S_5$  carries an arm  $L_8$ , whose end presses on the pin  $P_7$ , and is

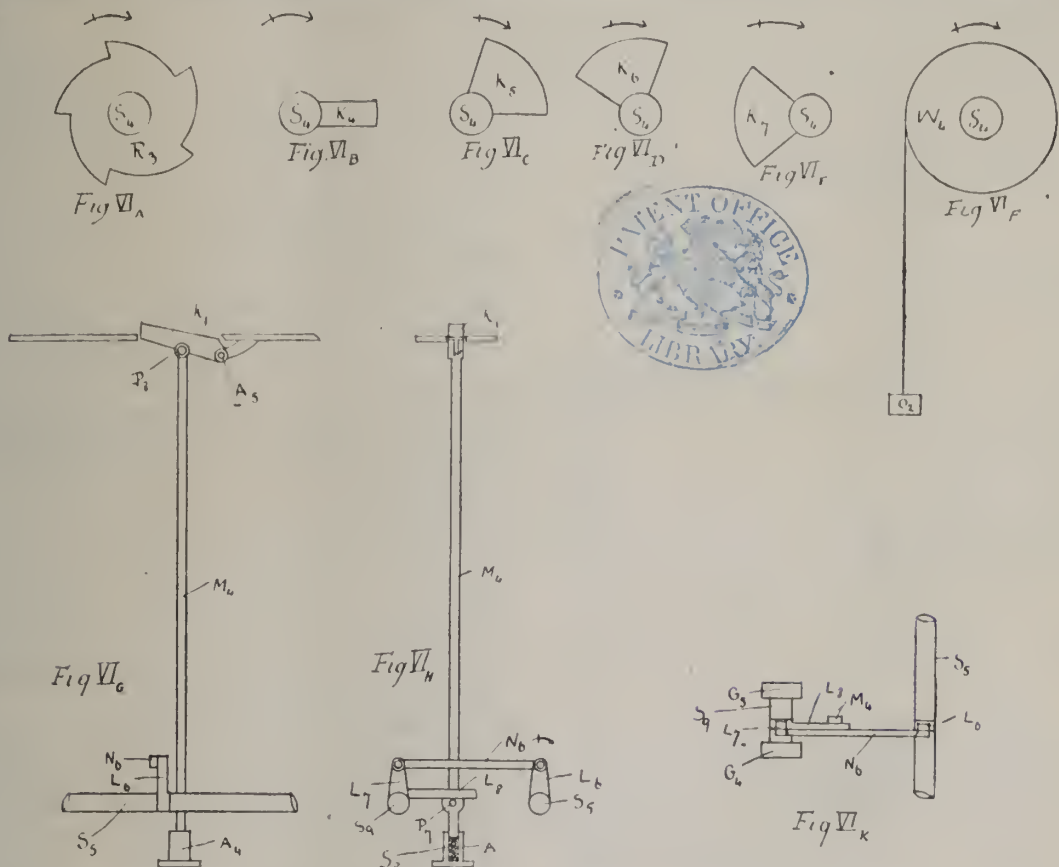


attached to the vertical rod  $M_4$ . The bottom end of the rod  $M_4$  fits into a shoe  $A_4$  containing a spring  $S_4$ . The upper end of  $M_4$  is attached to the catch  $K_1$ , swinging on the fulcrum  $A_5$ . It will now be seen that if the shaft  $S_5$  revolves in the direction shown by the arrow in figure 6 H, the catch  $K_1$  will be pulled down, and will return to its normal position by the action of spring  $S_4$ . Also if the carrier  $X_1$  be returned along the shaft  $S_1$ , it will press  $K$  down till it passes over it, when  $K_1$  will assume its normal position. The carrier  $Y$  having finished its travels it impinges against a projection on the side of the case, thereby sounding a second bell or similar device, intimating that the photograph is ready for delivery. A projection  $m_1$  on the catch  $m$  on the plate carrier  $X_1$  (shown in sectional elevation in fig. 5c) now abuts against the end of a lever  $H_4$ , affixed to the eccentric  $H_3$  on the shaft actuated by the lever  $L_5$  (see fig. 7B). When the said lever  $L_5$  is revolved, the end of the lever  $H_4$  presses against the projection  $m_1$  and so releases the plate, which falls into the

tube  $K$ , and through it to the outside of the machine into a suitable receptacle attached thereto.

The person desiring the photograph will now actuate the lever  $L_5$  so arranged that (1) it winds up the different weights that have run down on the wheels  $E$  and  $W_2$  by means of  $H$  and  $W_3$ , (2) it pushes forward the plates in the plate box, and (3) allows the photograph to fall out of the said slot or tube  $K$ .

These three results are effected in the following manner:—Outside the case  $A$  (see fig. 1) is a lever  $L_5$  swinging on a shaft which goes through the side of  $A$ , and has the drum or pulley  $W_9$  and the eccentric  $H_3$  attached to it inside. The two wheels  $H$  and  $W_3$  (fig. 1) are made so that they are of equal diameters, and that diameter such as to give a circumference of the same length as the distance the carrier  $Y$  slides along the shaft  $S_1$ . The pulley  $W_9$  has the strings leading from the pulleys  $H$  and  $W_3$  and the carrier  $Y$  wound on it, and a revolution or part of a revolution given to the said pulley  $W_9$  by  $L_5$



will then wind them all up simultaneously (see figs 7a and 7b). The eccentric  $H_3$  is connected with the rod  $N_2$  by similar mechanism to that already described, by means of which the shaft  $S_5$  is revolved, hence the rotation of the lever  $L_5$  will by means of the ratchet arm  $A_3$ , pawl  $J_2$ , and ratchet wheel  $W_3$ , rotate the shaft  $S_6$ , and the worms  $w_1$  and  $w_2$ , which have left and right-handed threads thereon, and will therefore turn the wheels  $W_6$  and  $W_7$  and the spindles  $B_2$  and  $B_3$  in opposite directions (see Figs. 1 and 2).

The opposite movement of the spindles  $B_2$  and  $B_3$  will advance the plates in the plate-box  $B$ , the arrangement of which is as follows:—The plate-box is provided with four pulleys, over which two bands work. The outer circumference of the said horizontal bands is provided with projecting pieces of tinned iron or any other suitable material, between which the plates are held vertically so that it is only necessary to revolve the pulleys a short distance corresponding to the thickness of the plate, as will be readily seen by reference to figs. 5D and 5E, which show respectively end sectional elevation and partly sectional plan of the plate-box  $B$ ; and to fig. 5H, which shows the method of

attaching the metal clips to the leather straps. The spindle  $B_2$  carries pulleys  $w_1$  and  $w_3$ , and the spindle  $B_3$  carries pulleys  $w_4$  and  $w_6$ ; the spindles  $B_1$  and  $B_4$  carry similar pulleys. The top pulleys on  $B_1$  and  $B_2$  carry an endless strap or band  $q_1$ . The top pulleys on  $B_3$  and  $B_4$  carry an endless band  $q_2$ . The bottom pulleys on  $B_1$  and  $B_2$  carry an endless band  $q_3$ , and the bottom pulleys on  $B_3$  and  $B_4$  carry an endless band  $q_4$ . These bands have metal clips attached to them in the manner shown in figs. 5E and 5H, and are so arranged as to carry the plates  $p_1$ ,  $p_2$ ,  $p_3$ , &c., as shown in fig. 5E,  $s$  is a slot in the bottom of the plate-box. If now the spindles  $B_2$  and  $B_3$  be rotated in the direction of the arrow shown in fig. 5E the plates will all move till the plate  $p_1$  comes over slot  $s$ ;  $p_2$  has taken the place of  $p_1$ , and so on. Now, when the shutter covering the slot  $s$  is withdrawn, the plate  $p_1$  falls into the plate-carrier  $X_1$ , and when the spindles  $B_2$  and  $B_3$  are again rotated, the plate  $p_2$  comes over the slot  $s$ , and so on.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is—

1. An apparatus for automatically taking, developing, and







(2 litres). The whole mass is then thoroughly stirred until homogeneous.

The emulsion is now finished, and after filtering through pure washed flannel, is ready for preparing the films.

Some sheets of polished plate glass, after perfect cleansing, are coated with talc in the manner usual for enamelling, and are slightly warmed in front of a fire. They are placed upon perfectly level supports and coated with the emulsion, which should be quite free from air bubbles or dirt. The emulsion is spread evenly over the surface of the glass, and then allowed to set. For plates 60 by 50 centimetres, about 150 cubic centimetres of emulsion are required. As soon as the emulsion has set on the glass, sheets of paper (preferably Rive's) which have been evenly swelled by damping, are lowered on to the surface of the emulsion, and the whole placed in a warm air chamber to dry. When dry the emulsion should leave the glass with a highly polished and smooth surface, and should adhere firmly to the paper. After exposure in the camera or by contact the damped film is floated, paper side downwards, on a pyrogallol solution or developer containing a proportion of alcohol.

A good developer contains:—

Pyrogallol	...	...	...	...	1 gramme
Ammonia (88)	...	...	...	...	1 c.c.
Potassium bromide	...	...	...	...	.5 gramme
Water (distilled)	..	...	...	...	180 c.c.
Alcohol	...	...	...	...	20 c.c.

The above mixture is poured into a dish having an inner slightly raised edge all round—until it overflows the inner edge. The film is then immediately lowered upon the surface, paper downwards. As soon as the portions of the film where the shadows will be are seen to soften and glisten, the film is lifted off the developer and lowered upon a pad of bibulous paper. Or instead of floating the film, its surface may be rubbed over with a waxing solution (to prevent its getting wetted by the water) and immersed in the developer.

Glass or flint is crushed and filtered through a lawn sieve; it is moistened with a 1 per cent. solution of wax in benzole (wax 1 gramme, benzole 1,000 c.c.) and stirred until dry. It is then kept in a bottle, the neck of which is covered with a piece of lawn for use as required. The film, which has been taken off the wet developer, is now dusted with the glass, which permeates or sinks into the film in proportion to the intensities of light. The film (together with the paper which still supports it) is lastly laid upon a polished copper or zinc plate previously coated with gum, dried with (or without) the aid of heat, and the powdered glass brushed off. The surface will now be found grained or etched in relief, in exact proportion to the varying intensities of light which fell upon the portions of the film during the exposure.

To print from this surface I prefer to proceed in the following manner:—I warm the plate and rub over the surface with sweet oil and turpentine on a rag. I then dab ink on plate with flannel, and clean off the surface with the palm of the hand, using whiting at the finish. I again warm the plate and drag ink smoothly over the surface, and finally put the plate through a roller press with damped paper on top. Although the grained or etching process, as above described, is preferred, it admits of further simplification, as follows:—The metal plate is coated direct with the emulsion from which the second portion of gelatine is omitted. The plate, after exposure, is developed with a developer containing alcohol, the surface wiped, and the plate heated until the film is seen to swell and soften. The glass or other coarse powder is dusted over, and the plate is treated as before.

Instead of dusting with the powdered material a roughened surface may be applied with pressure to the film, so that indentations are produced in proportion to its relief or softness. Or without the application of glass powder, or the like, the plate may be used for printing by other printing processes in which the swelling or softening of a film are utilised.

When I desire to avail myself of the absorptiveness of the sensitive surface in order by its aid to prepare an etched plate I prefer to proceed as follows:—A copper plate is covered with a graining film in the ordinary way, and is then coated with the emulsion (from which the gum-arabic is omitted) and is dried. The dried plate is dipped in a solution of soluble gum containing a very small quantity of undigested silver bromide and again dried. After exposure the plate is intended to be etched is developed by immersion in the pyrogallol developer, washed, and then treated with the ordinary (ferrie chloride) etching solution.

When the etching is complete the film is removed and the plate is retouched ready for printing in the ordinary way of printing from etched plates.

The treatment with soluble gum with a little undigested silver bromide as mentioned above is for the purpose of forming a covering to the surface layer of the film such as will prevent the abnormal action of the developer upon this layer to which reference has already been made. This precaution is applicable with advantage to the process previously described in which the emulsion is applied direct to the plate, and not only to this process, but in all cases where the circumstances are such that the developer cannot conveniently be applied on the under side of the film.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. The improvement substantially as described in photo-mechanical printing consisting in the production of a printing plate or surface by the aid of a silver emulsion film and a developer which leaves the parts of the film on which the light has least operated in a swollen or absorptive state, and graduated in accordance with the intensity of the light, so that the parts of the film least exposed to light become raised above or more absorptive than the parts which have been more exposed as herein set forth.

2. The improvement substantially as described in photo-mechanical printing consisting in the production of a printing plate or surface by applying to the surface of a silver emulsion film after development a fine pulverulent material such as powdered glass, or a surface in grained relief in such manner that the same adheres or penetrates more or less in proportion to the intensities of the light to which the different portions of the film have been exposed as herein set forth.

3. The improvement substantially as described in photo-mechanical printing consisting in the production of a printing plate or surface by coating a plate with a silver emulsion film, transferring the same to a surface of paper or like material, exposing the film (after insulation) on its under side to a developing solution, and producing a more or less grained or indented surface in accordance with the exposure as herein set forth.

4. The improvement substantially as described in photo-mechanical printing consisting in the production of a printing plate or surface by applying a silver emulsion film to a plate on which an etching ground has been previously laid, then exposing the film, afterward applying etching solution over the film, and so as to bite the picture into the plate as herein set forth.

5. The improvement substantially as described in photo-mechanical printing consisting in the production of a printing plate or surface by the aid of a silver emulsion film, and a developer applied to the under side of the said film as herein set forth.

6. The improvement substantially as described in photo-mechanical printing consisting in the production of a printing plate or surface by the aid of a silver emulsion film provided with a soluble surface covering of gum or like material protecting the surface layer of the film and preventing its abnormal action as herein set forth.

7. My improvements in photo-mechanical printing substantially as herein described.

## Correspondence.

### RICHMOND PHOTOGRAPHIC EXHIBITION.

DEAR SIR,—At a meeting of the committee this evening, it was decided to strike out that portion of Rule IV. which prohibits the placing of the title on the front of an exhibit. Also the last date for entering exhibits has been extended.

I should be very much obliged if you would kindly insert in the next issue of your paper an intimation of these changes as follows:—

Rule IV., amended.—Title will be allowed on front of exhibit, but not name or address.

The time for entering exhibits has been extended up to and including Saturday, December 22nd, 1888.—I am, yours faithfully,

ALBERT CHANCELLOR, Hon. Sec.

1, King Street, Richmond, Surrey, 17th December, 1888.



## THE WEST LONDON PHOTOGRAPHIC SOCIETY.

SIR,—Will you allow me, through the medium of your valuable paper, to inform those gentlemen who were unable to be present at the inaugural meeting in the Chiswick Hall of the above Society last Friday, that the next meeting will be held at the newly erected Addison Hall, on Friday, 28th inst., at 8 o'clock. The Hall is situated at the northern end of Addison Road, and is within three minutes' walk of Uxbridge Road Station, to which point there is communication by tram-car from Chiswick, Kew, and neighbourhood. There is an alternative route by train to Addison Road Station from Turnham Green and Gunnersbury Stations; omnibuses also run past the south end of Addison Road from Hammersmith.

Will Mr. Bennetto, and those gentlemen who did not give in their addresses, communicate the same to either Mr. March or myself?—Faithfully yours,

87, Chancery Lane, December 17. JOHN A. HODGES.

## Proceedings of Societies.

## PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE technical meeting of this Society, which was held on Tuesday evening last, the 18th inst., was, probably, the smallest on record. The fact that owing to Christmas Day falling this year on the fourth Tuesday of the month, which is the ordinary date for these technical meetings, necessitated the holding of the present one on the third instead of on its usual date, was probably responsible in part for the smallness of the attendance, which, however, was doubtless mainly due to the dense fog prevalent at the time; so dense, that at Charing Cross it was scarcely possible to see across the pavement. The meeting, for the greater part of the evening, consisted of ARNOLD SPILLER as Chairman, the Assistant-Secretary, three reporters, and one ordinary member, Friese Greene. On the arrival at five minutes to nine of Mr England, a second meeting was held, another member or two dropping in.

FRIESE GREENE mentioned that he had fitted up a screen, consisting of a plane formed by parallel glass tubes placed in contact with each other, for use in front of the arc light when employed for photographic portraiture. He found that the exposure was then more rapid than when using a screen of tissue paper, as he had been accustomed to do.

W. E. DEBENHAM suggested that a second screen of tubes should be placed with the tubes at right angles to those in the first screen. The light would thus be diffused both vertically and horizontally. He would suggest also that the screens should be formed of single pieces of tubing bent in close gridiron fashion and filled with water. There would then also be a good opportunity for experimenting with liquid in the tubes, cutting off certain rays that caused the light to appear dazzling to the sitter, and allowing the more photographically active rays to pass. Perhaps sulphate of copper in ammonia would prove suitable.

ARNOLD SPILLER said that cupro-ammonium was a solution in common use for separating certain rays of the spectrum.

FRIESE GREENE proposed the use of celluloid films similar to those employed for negative emulsion as a basis for collodion positives. He thought there was a good opening for reviving a branch of the business that at one time was very popular.

W. E. DEBENHAM suggested the coating of the celluloid with a film of a substance that would preserve it from the action of the chemicals used in the collodion process.

CARL NORMAN showed in action a lamp constructed by Gaedieke of Berlin, for use in the dark room, giving a monochromatic yellow light. This lamp has been recently described in the PHOTOGRAPHIC NEWS, and consists of a ring of asbestos saturated with a sodium salt suspended in a Bunsen flame, and surrounded by a yellow glass chimney.

Suggestions were made on the use of lithium salts in place of sodium, and the members, after cordially thanking Mr. Norman for bringing the lamp before them, shortly afterwards adjourned.

## CAMERA CLUB.

On Thursday, Dec. 13th, A. A. COMMON gave an address on Astronomical Photography, with especial reference to photographs of nebulae. J. TRAILL TAYLOR occupied the chair. A large number of fine photographs were shown on the Club

screens. These were lent by Messrs. Common, Shipton, and Colonel Tupman.

The lecture was fully illustrated by a series of lantern slides, the photographs being projected on the screen.

MR. COMMON drew attention to the many advantages of photography over hand work in astronomical photography, and indicated the great services rendered by the camera in astronomy.

A discussion followed, in which the use of orthochromatic plates and variations of developers were treated of.

On Thursday, December 27th, the slides intended for the Camera Club Exchange with American societies will be shown in the lantern.

## BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE third annual Exhibition and Competition was held on Friday, Dec. 14th, in the large Lecture Hall, Needless Alley.

The number of entries was far in excess of previous years, some 300 pictures being sent in for competition alone. A large quantity of photographs were received for exhibition only, notably those by Harrold Baker, Hall Edwards, R. Keene (Derby), E. C. Middleton, A. Pumphrey, and J. Titley.

The competitions were divided into 13 classes, besides special competitions.

The judges were Harrold Baker, J. T. Cox, B. Karleese, R. Keene (Derby), and E. C. Middleton, and their awards were as follows:—Class 1.—Instantaneous: 1, "Steam Trawler," by Dr. J. C. Huxley; 2, "Somersaults," by W. J. Harrison. Class 2.—Landscapes: 1, "Scene near Hampton," by Dr. Huxley; 2, Irish landscape, by A. D. Zuir; 3, "Bridge at Hampton," by Dr. Huxley. Class 3.—Developed contact prints: 1, "Stonehaven Harbour," by Dr. Huxley; 2, "Good Dog," by W. Rooke; 3, "Broadway Village, Worcester," by Dr. Huxley. Class 4.—Transparencies: 1, W. Rooke for landscape; no second prize was awarded. Class 5.—Enlargements: 1, fish, by J. F. Pike; 2, cottage, by E. D. Fowler; 3, group, by H. W. Southall. Class 6.—Home portraiture: 1, lady and child, by Thomas Taylor; this was of the highest class, being an untouched negative. The second prize was taken in this class by J. J. Button with a group noticeable for its technical excellence. J. H. Pickhard was highly commended. Class 7.—Lantern Slides: 1, J. J. Button; 2, E. H. Jacques; 3, H. R. Wakefield. Class 8.—Carbon Prints: There were only two entries, and no prizes were awarded. Class 9.—Stereoscopic Slides: Although there was only one exhibit, by E. D. Taylor, the exhibited was of such excellence that the judges awarded a prize. Class 10.—Prints from Film or Paper Negatives.—First prize withheld; 2, F. Hoskins, for "Landscape on the Wye"; W. J. Harrison commended. Class 11.—Photographic Micrography: Only two competitors. The prizes were withheld, but an honourable mention awarded to Dr. J. F. Hall-Edwards. Class 12.—For best General Exhibits: The judges found no difficulty in awarding this prize to Dr. Huxley. Class 13.—Interiors of Churches and Cathedrals in the United Kingdom: 1, Lichfield Cathedral, by W. J. Harrison; 2, Interior of Beauchamp Chapel, St. Mary's, Warwick, by Charles Phillips. In the special competitions no prizes were awarded for pictures illustrative of street trades or for reflections. For the best set of three photographs taken within three miles of Stephenson Place, J. F. Pike took the prize with three very pretty representations of the Old Priory Moat, Edgbaston.

The Exhibition was kept open on Saturday, the 15th inst., and proved a great success.

## NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

THE ordinary monthly meeting was held on Tuesday evening, the 11th inst., in the Mosley Street Café, Newcastle, J. P. GIBSON in the chair, and there was a large attendance of members.

The nomination of officers to be elected at the annual meeting in January next was then proceeded with, after which there was a demonstration and discussion on bromide enlarging and other matters.

## LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE ordinary weekly meeting was held on 13th inst., L. MEDLAND in the chair.

J. Moran and W. D. Douglas were elected members.

J. B. B. WELLINGTON passed round a sheet of white blotting-paper. This he had used to blot off the moisture from the face of a platinotype print after it had been fixed and washed; a discolouration of the blotting-paper was caused thereby, the



image from the print being clearly discernible on it. The blotting-paper was subsequently used as a pad in a printing-frame in contact with sensitized albumen paper. By accident it got wet with rain, and upon removal from the frame the image on the blotting-paper was found to have become intensified, and the colour, previously dark, changed to a sepia tone.

A discussion followed, but nothing definite was elicited.

The CHAIRMAN showed a lantern carrier he had constructed; it held five transparencies, which were showed along the front of the lantern in the ordinary way, the opposite end of the carrier being stopped; the object being that after the insertion of the fifth slide the centre one of the five would always be accurately centred with regard to the optical combination; the end slide was then lifted out of the frame, allowing the others to be pushed forward.

The remainder of the evening was devoted to the exhibition of members' transparencies with the optical lantern, contributed by the Chairman, P. Everitt, A. Cowan, H. Starnes, J. E. Freshwater, and H. M. Hastings.

#### WEST LONDON PHOTOGRAPHIC SOCIETY.

A LARGE number of gentlemen interested in photography met at the Chiswick Hall, on Friday, the 14th inst., for the purpose of discussing the question of the advisability of forming a Society for West London, which district has been hitherto unrepresented by any such institution.

By the unanimous vote of the meeting, G. F. BLACKMORE, Assoc. M.I.E.C. (who has taken a very active part in promoting the object in view), occupied the chair.

The CHAIRMAN, in opening the proceedings, said that a society for the promotion of the science and art of photography had been confessedly a long-felt want in the district, by which term he meant to include not only the neighbourhood in which they found themselves that evening, but all the surrounding localities. He might mention that the original idea had been to hold the meetings in the neighbourhood of the Broadway, Hammersmith, but some difficulty had been experienced in finding a suitable hall. He did not, however, give up all hope of success, for those who were associated with him were still prosecuting their enquiries.

Dr. F. HARRISON LOW called attention to the fact that rooms were available at the newly-erected Addison Hall, and asked whether any enquiry had been made of the secretary as to terms.

The CHAIRMAN replied that that had not been done, but that he had specially called attention to the point in order to gauge the wishes of the meeting and receive suggestions.

CHARLES BILTON, B.A., said, speaking for himself, and probably every person present, he thoroughly endorsed the opening remarks of the chairman as to the desirability of establishing a photographic society for the district. He was very glad to see this preliminary meeting so well attended, and thought he might accept that fact as being ominous of a successful future for the society. He therefore had very great pleasure in moving "That it was desirable to form a photographic society for West London."

The motion having been seconded by J. A. HODGES, was carried unanimously.

The meeting then resolved itself into committees to consider and draw up a code of rules. It was ultimately decided that there should be an entrance fee of 5s. and an annual subscription of 7s. 6d., but that members joining prior to 1st March, 1889, should be exempt from the payment of entrance fee. It was further arranged that the ordinary meetings of the Society should be held on the second and fourth Fridays in each month. The election of officers was then proceeded with.

JOHN A. HODGES said that it was his pleading duty to propose the election of William England as President of the new Society. He felt that the name of Mr. England was so well known in the photographic world, that it would be conceded on all hands that anything beyond the mere mention of his name was unnecessary.

The motion was carried with acclamation.

Dr. P. H. EMERSON, E. O. Fountain, Chas. Bilton, and W. L. Colls were then elected Vice-Presidents.

The following gentlemen were elected as the Council:—G. J. Blackmore, Assoc. M.I.E.C., J. D. England, E. W. Foxlee, T. S. Hazen, James Hyatt, F. Harrison Low, M.D., C. Garner Richardson, Wyndham Rickford, Charles Whiting, and Charles Wiater.

Lyonel Bennett was appointed Hon. Treasurer, and T. B. March and John Alfred Hodges were appointed joint Hon. Secretaries. The address of Mr. March is "Pentille," Elliott

Road, Chiswick, W., to whom all communications should be addressed.

A large number of ladies and gentlemen were enrolled members of the Society.

It has been arranged to hold the next meeting at the Addison Hall, Notting Hill.

#### READING AMATEUR PHOTOGRAPHIC SOCIETY.

The third monthly meeting of this Society was held at the Forbury Temperance Rooms, Blagrove Street, on Wednesday evening, December 12th, when a *soirée* and lantern exhibition of members' slides took place, W. B. MONCK presiding.

Dr. RICHARDSON ably manipulated the lantern, which he had lent for the occasion, and a demonstration of "Flash-light" photography was given by the SECRETARY (J. Phillips), who afterwards developed a successful negative.

Several photographic novelties were shown by members, and a very interesting evening was spent. The meetings were arranged to be held on each second Wednesday in the month, consequently the next gathering will take place on January 9th.

#### DERBY PHOTOGRAPHIC SOCIETY.

A GENERAL MEETING of this Society was held on Tuesday evening, Dec. 11th, in their room, Victoria Street, R. KEENE presiding.

The subject for consideration was the new rules, which a special committee had been appointed to draw up, and which, after some discussion, were adopted. The question of holding the annual *conversazione*, and printing the "Presentation Print," next received attention, and after due consideration it was unanimously decided to abandon both for the present, it being the intention of the Society, by desire of the members, to obtain a room of their own, and eventually to fit it up with a dark-room and reference library.

#### CHESTER SOCIETY OF NATURAL SCIENCE (PHOTOGRAPHIC SECTION).

The usual monthly meeting of the Section was held on December 6th, in the Grosvenor Museum, E. W. PARNELL, F.C.S., in the chair. H. S. BELLSMITH, representing the Eastman Dry Plate and Film Company, gave a demonstration of "The Development and Treatment of Film Negatives, and of Making Bromide Enlargements," and prefacing his work by an address on the best methods of successful working, at the close of which he proceeded to strip some negatives taken during the day in the Kodak detective camera, and which had been developed previous to the meeting. A large number of negatives and prints were handed round for inspection.

#### ALLAHABAD CAMERA CLUB.

The newly-formed Amateur Photographic Society for Allahabad held its first general meeting of members on 24th November, at the Muir College, to consider and adopt the rules drawn up by a provincial committee. The name of the Society was agreed upon as the Allahabad Camera Club, and officers and committee were elected as follows:—

President—Justice Straight.

Treasurer—C. T. Edwards.

Secretary—A. Wingrave.

It was decided to hold a special opening meeting on Tuesday evening, December 11th, to draw attention to the formation of the Club. To this gathering, at which S. A. Hill kindly promised to read a paper, all those interested will be invited. The meeting will be held at the Club premises, 9, Albert Road.

#### LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.

The annual winter season Lantern Slide Exhibition was held on Wednesday, Dec. 12, in the Old Town Hall, GEO. BANKART, President, in the chair.

The quality of the exhibition gave satisfaction, and the number of slides—150—offered facility for choice and comparison. A number of pictures were first exhibited by W. T. Turke, comprising views in Devonshire and Isle of Man, and quite maintained his reputation as a successful manipulator. Next followed a number of slides by J. B. Cook, illustrating scenes and incidents in South America and on the voyage *en route*, which were well executed, and afforded considerable instruction and added much to the interest of the exhibition; a selection of marine views, interiors of locomotive engineering works, and examples of rustic scenery were next exhibited by W. Scotton, Derby, and after contributions by the Hon. Sec., were followed by a series of instantaneous subjects of J. B. B. Wellington.

To these succeeded a number of splendid pictures, views, and



instantaneous effects from Fry and Sons, of Chaudos Street. The lantern, biunial oxyhydrogen, was provided by the firm of Taylor, Taylor, and Hobson.

Three members were elected, and two nominated.

#### SHEFFIELD CAMERA CLUB.

THE ordinary monthly meeting was held on Dec. 14th at 34, Bank Street; Dr. MORTON presided.

Messrs. T. S. Yeomans and Harrop were appointed auditors.

A number of interesting objects were exhibited, including a successful series of negatives on the Eastman stripping films, contributed by Mr. Barraclough; rapid shutter, &c., by Mr. Rawson. The chairman showed a 12 by 10 negative on one of Wratten's ordinary plates that he had kept nearly five years before using; the plate showed no sign of deterioration. The batch, however, had been carefully wrapped up, and in a dry cupboard. Mr. Gilley brought a fine series of photographs by Burton Bros., Dunedin, showing the peculiar lava lakes of New Zealand, including the white and pink terraces as they appeared before the late volcanic eruption.

Mr. ARNOLD then gave a demonstration on lantern slide making. He preferred ferric oxalate development, and in making the negative pyrogallol was used. The lecturer had tried magnesium light for copying engravings, but found daylight preferable, and he worked with advantage in a well-lighted bay window. Negatives of medium density made the best slides; those requiring a minute exposure in the gaslight came up strongest. Two plates were exposed, under different negatives, thirty seconds to gaslight, and developed with iron—1 to 6 of oxalate. The contrast was well shown.

The Club, which is steadily increasing in members, is about to secure more commodious rooms.

#### NOTTS AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE members of the above Association met again on Monday evening, Dec. 17th, to continue the experiments on the new flash light, when there was a large attendance, the President, Henry Blandy, occupying the chair. Minutes of previous meeting were read and confirmed. Business arising out of the minutes and correspondence being disposed of, Junius Holroyd, of the Ropewalk, was elected a member. W. Burrows then proposed, and Mr. Blandy seconded, that the Rev. T. Beckton become a member of the Association. As at the previous meeting, G. E. Williamson and S. Carnell were demonstrators. Mr. P. E. Knight, the Secretary, having obtained several flash light lamps from the London manufacturer, the demonstrators proceeded to test the merits of the different lamps, using, as before, plates of all makers, with Ross and Dallmeyer's lenses. A. James, of Buckingham Palace Road, London, exhibited his triple flash lamp, which gave splendid results. On a Wratten ordinary 12 by 10 plate, W. Burrows secured an excellent group of fifteen members, every detail being satisfactory; and three 12 by 10 busts of the president and vice-presidents on Wratten's drop shutter plates, were excellent portraits, equal in every respect to daylight work, the detail and graduation of tone being everything desired. Exposures were made with Vevers', of Leeds, flash lamp, and the results were satisfactory. A proposition for the Society to purchase Mr. James's lamp was referred to the committee.

### Talk in the Studio.

**PORTRAITURE, PAST AND PRESENT.**—A lecture on this subject was delivered on Tuesday evening, the 11th inst., by Harry Furniss, in the lecture hall of Union Street, Islington. The lecturer said that portraiture was a large and complicated subject, embracing many periods. Carlyle had said that human portraits, faithfully drawn, were the best pictures that could be hung on walls. The National Portrait Gallery was founded about 70 years ago, and its founder, Lord Stanhope, only asked at the time for an annual grant of £500, with which to supply the nation with portraits, and that request was acceded to. At the present time, this country, the richest and most civilised in the world, only provided £1,000 a year to supply portraits of its greatest men and women. Great difficulty was experienced in getting possession of the portraits of the past, many of them being locked up in the stately homes of the aristocracy. The National Portrait Gallery should be the nation's history of great men, by great artists, and he thought that portrait painting should be more encouraged by the nation, as they would then

obtain a portrait gallery worthy of the country. Various specimens, both of past and present styles of portraits, were exhibited by the aid of limelight, among them being those of Sir Joshua Reynolds, who, the lecturer observed, had certainly never been excelled as a delineator of beautiful and graceful women, and although portrait painting had made rapid strides, still there was much to be appreciated in those of the past. Photography had attempted to take its place, but had certainly failed.—*From the Daily Chronicle.*

**THE PATENT OFFICE PUBLICATIONS.**—A memorandum of the Controller states that from the beginning of 1889, the *Official Journal of the Patent Office*, the *Illustrated Journal of Patented Inventions*, and the *Law Reports of Patents, Designs, and Trade Marks Cases* will be combined in one publication called the *Illustrated Official Journal (Patents)*. This journal will be issued every Wednesday, price 6d., by post 8d.

**A QUESTION OF PARTNERSHIP.**—At the Rochester County Court on Tuesday, Messrs. Hyatt and Ryan, described as Photographers of New Brompton, were sued by Mr. F. Cowan, Chemist, of Rochester, for £5, for chemicals supplied for use in the business. The defence set up was a denial on behalf of Mr. Ryan of the partnership, and he, through his solicitor, contended that Mr. Hyatt had used his name without his authority or leave. He admitted that "Hyatt and Ryan" appeared on the shop fascia, and that the photographic mountings had also been similarly printed on the back, but this latter was done without his consent, and Hyatt, who had gone away, had to obliterate his name therefrom. With regard to the shop fascia, he allowed the name of Hyatt and Ryan to be put up without thinking that such permission would be construed into a partnership. The Judge said it would be impossible to get on without the evidence of Mr. Hyatt, and he adjourned the case for Mr. Cowan to procure his attendance.

**PHOTOGRAPHIC CLUB.**—There will be no meeting on Dec. 26th. On January 2 there will be a lantern night; visitors are invited.

### To Correspondents.

**C. W. BRADSHAW.**—1. Possibly the negative may be improved by a slight intensification, but it would be better to try another plate and give longer exposure. 2. As a title, "Tired of Standing" would perhaps be more appropriate than the other.

**R. EAST.**—From your description, we take it that the imago is far too weak for treatment in the usual way, but perhaps if you put the plate—as whitened by mercuric chloride—over a black surface and copy by reflected light, you may obtain a printable negative.

**F. E. BEESON.**—We have mislaid your address, so cannot forward you the complimentary copy of the *YEAR-BOOK*.

**II. AMBROSE.**—1. Plate-glass should be used; the thin sort known as patent plate being most convenient. 2. A sheet of white paper is ordinarily placed underneath, as it enables the operator to see the condition of the plate. 3. Coignet's gold label gelatine. 4. To make quite certain it may be worth while to regrid each time.

**C. F. W.**—1. It was quite a mistake, and not a very important one. It is, as you see, right this time. 2. Gelatine is the medium used, and the best kind to employ is a highly soluble gelatine like Cox's soup gelatine. 3. Probably next week.

**W. H. D. PYNE.**—We are glad to have the information, and hope the portrait will please those interested.

**ARTHUR W. RANKIN.**—We think that you cannot do better than carry out the plan you suggest, but to give the broken glass temporary rigidity you had better cement it to a piece of wood. Instead of soaking the plate in the dilute hydrofluoric acid, you might try the plan suggested by A. Pumphrey in the *YEAR-BOOK*. Soak the plain film in one of acid to sixty of water, and squeeze down on the negative, with a sheet of paper behind the plain gelatine. After an interval, the whole can be drawn off the glass and stretched on a board to dry.

**HEMECTICUS.**—1. Write to the secretary of the former at Burlington House, London, and to that of the latter at Adelphi Terrace, London. 2. According to our own experience, the film of collodion is absolutely necessary if the best results are desired—that is, if none of the pigment is to be washed off.

**BELGIUM.**—1. We do not know of any substance which has the same effect when pyrogallol development is adopted. 2. The result is not quite so satisfactory if the addition is made at the early stage referred to. 3. The ripening action appears to take place slowly, even if the degree of moisture is but small; and our own experience corresponds with yours as regards the effect of damp on slow plates. 4. Nothing.

**J. R. HARRIS.**—They are generally made of soft iron, but the best are steel-faced, and finally worked to accurate shape after hardening. Solid steel is unsuitable.

**B. LOWEINE.**—Ruskin certainly said so, but it does not necessarily follow that it is so; even he may have been mistaken.



# THE PHOTOGRAPHIC NEWS.

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### HYDROKINONE FOR DEVELOPING BROMIDE PRINTS—HYDROKINONE SOLUTIONS FOR KEEPING.

THE growing favour which is being accorded to the employment of hydrokinone as a developer, and to which we have recently referred, is by no means confined to its use in one particular process. Hydrokinone may be remembered as the one agent given by Dr. Vogel for use with those collodio-bromide orthochromatic plates which promise to rival gelatine work in rapidity. Hydrokinone with sulphite and soda has recently been strongly recommended for gelatine plates, and now we have a communication from Mr. E. Vogel, junr., published in the *Photographische Mittheilungen*, in which he says that he now uses hydrokinone to the exclusion of all other developers for paper prints, as well as for gelatino-bromide plates. No other developer, in this writer's opinion, permits of such easy, clean, and completely certain work. This is a very strong expression of opinion from an able worker. If in the hands of others it ensures a like favourable verdict, there will have to be an improvement in the method of using pyro, or that agent must in all probability encounter neglect similar to that which, for all save printing and reproduction processes, has come upon iron development.

Although now using hydrokinone only, for the development of paper prints, Mr. E. Vogel encountered some difficulties and objections, which, having overcome, he describes for the guidance of those who may follow. To begin with, he mentions that with over-exposure, even in slight degree, the picture, especially if the film contain much iodide of silver, readily acquires a disagreeable greenish hue. He has recently found that the tone of the picture depends essentially upon the amount of carbonate of soda present in the developer. With a solution prepared according to the following formula:—

Crystallised sulphite of soda	...	40 grains
Hydrokinone...	...	5 "
Water...	...	2½ ounces
Crystallised carbonate of soda	...	50 to 150 grains

it was found that when the carbonate of soda was in small proportion—i. e., up to 75 grains—the tone of the print was always greenish; with a larger proportion of soda the tone improved, becoming eventually black or blackish brown.

With 75 grains of carbonate of soda good results were obtained, provided the exposure was exact, but not if there was over-exposure. A very great increase of soda produced some blistering. Carbonate of potash possesses the advantage, for the development of paper prints over soda, that a greenish tone is never obtained with it, and is therefore to be strongly recommended for positive work.

The following mixture was prepared:—

Crystallized sulphite of soda	...	40 grains
Hydrokinone	...	5 "
Water	...	2½ drachms

When perfectly dissolved (hastened by standing the bottle containing the ingredients in warm water), 50 to 54 grains of carbonate of potash was added. A larger proportion of carbonate of potash than this causes, especially in warm weather, considerable frilling. For use, one part of this solution is diluted with five parts of water. The developer, in the concentrated form as above, keeps good for a long time; when diluted to the strength given for use, it remains good only for about two or three weeks. The strong solution is, on account of its keeping properties, very convenient for use on a journey. When using with gelatine plates, Mr. Vogel states that he obtained very good results with this formula, and that it may be especially recommended for instantaneous negatives on account of the very full amount of detail brought out by it. The development also proceeds quickly.

For negative work, Mr. Vogel prefers for the most part to use the formula with soda given on page 753 of the *PHOTOGRAPHIC NEWS*. It is important to notice that the sulphite of soda is in good condition; has not effloresced by keeping. On account of the greater keeping properties of a concentrated solution he now gives the formula in the following shape:—

Crystallised sulphite of soda	...	160 grains
Hydrokinone	...	20 "
Water	...	1½ ounces
Crystallised carbonate of soda	...	300 grains

The precaution previously mentioned of ensuring that all the hydrokinone is dissolved before the addition of the alkali must of course be observed. For use, two parts are diluted with five parts of water.

Both the potash and the soda developer can be varied so as to suit differing characteristics. For plates working with too much vigour, less water may be used in the developer; whilst on the other hand, plates yielding an image deficient in vigour may be treated with a solution to which more water has been added.

An item having an important bearing on the general extension of the use of hydrokinone is the much lower price at which it is now procurable. Mr. Vogel tells us that in Germany it is now less in price than pyrogallie acid, the cost of a kilo being thirty marks equal, to about tenpence per ounce of our money.

### AN ARRANGEMENT FOR MICROSCOPIC ILLUMINATION.

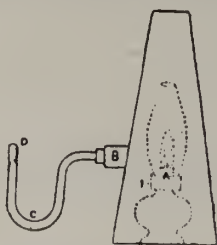
At a recent meeting of the Society of Chemical Industry, Mr. Thomas Christy exhibited an illuminator which is but



little known, although very valuable for certain kinds of work, and especially useful for photo-micrographic operations.

The following description is taken from the *Journal of the Society of Chemical Industry*:—

"It consists of a metal cone A, which slips over an ordinary oil lamp. A tube B is fixed at the side, and carries a bent glass rod C, which can be moved in any direction. The position of the tube B should correspond with that of the maximum light of the lamp. By means of internal reflection from the outside of the rod C, the light is carried, with comparatively little loss, to the polished end D, which is placed under or over the object to be illuminated. The light thus obtained is very soft and



bright, and quite free from heat rays. Any convenient form of rod may be used. The cone A may be made of tinned iron. Such an apparatus is easily and cheaply constructed. By having more than one side tube, several lights may be obtained from one lamp.

Although, if the outer surface of the glass rods were kept absolutely clean and free from condensed moisture, all light falling within the critical angle would be reflected and there would be no gain in silvering the outside, it is in practice an advantage to silver the outside of the glass rod, just as it is desirable to silver the hypotenuse of the reversing pinion. The bent glass rod, as a light leader, may take other forms than that represented above, and may be utilised with advantage when it is desirable to illuminate any part of a subject which is difficult of access, as, for example, in photographing the cavities of the human body. Of course, for such work, a far more powerful illuminant than an oil lamp is required.

#### A PHOTOGRAPHER CLAIMING A RIGHT TO MAKE USE OF A PORTRAIT NEGATIVE.

##### POLLARD v. THE PHOTOGRAPHIC COMPANY.

WHEN we recorded the first hearing of this remarkable action, Pollard v. The Photographic Company, we pointed out how rare a thing it is for a photographer who takes a photograph for a customer in the ordinary way of business to endeavour to make an after use of that negative for his own advantage, by selling or otherwise disposing of copies. Still rarer is it for a photographer to claim that he has any sort of right to make such use of a negative belonging to a customer. And for a photographer to come into Court and deliberately plead that he possessed such right is, we believe, a thing altogether unprecedented.

The question raised has nothing to do with the ownership of the negative itself, as when a photographer only contracts to supply prints, it is allowed on all hands that the material of the negative is his property; but the question raised is whether the photographer may make additional prints for his own use: the claim of the defendants being much the same thing as if a printer, who had been employed to print a book, claimed the right to print extra copies from the standing type, and to dispose of such copies.

The *Times* of last Friday devotes no less than three columns to this remarkable case, and we reproduce the formal report.

Pollard v. the Photographic Company came on for hearing in the Chancery Division of the High Court of Justice

on Thursday last, before Mr. Justice North, on the 20th inst., and the *Times* of the 21st inst. says:—

(Before MR. JUSTICE NORTH.)

##### POLLARD v. THE PHOTOGRAPHIC COMPANY.

This was an important case on the law of photographic copyright, in which his Lordship delivered judgment this morning. The question of law raised was whether in the usual case where a person is photographed, and pays for a number of copies, the negative not only remains the property of the photographer, but he is entitled to make what use he pleases of it short of libelling the person taken. In this case the plaintiffs were a gentleman and his wife. The lady was photographed by the defendant at Rochester, where he carries on business under the name of "The Photographic Company." She paid him a sum of money for her own likenesses and other photographs. He exhibited in his window a copy of Mrs. Pollard's photograph got up as a Christmas card, with the words "A Merry Christmas" above, "And a Happy New Year" below. This was sold to a person acting on behalf of the plaintiffs, with a view to bring proceedings. There was some conflict of evidence as to what the exact circumstances were, and how far the defendant was willing to sell to persons not friends of the plaintiffs, Mr. Andrews, who bought for the plaintiffs, and Mr. Bax, the defendant's manager, who sold, giving different versions. But as the defendant claimed a right to sell for the purpose of law, this was immaterial. A writ was issued endorsed with a claim for an injunction to restrain the defendant from offering for sale or selling, exhibiting as an advertisement, or dealing with the photograph either as a Christmas card or otherwise. The matter was brought on by way of motion for an interim injunction on the 30th ult., and was treated by consent as a trial.

Mr. Cozens-Hardy, Q.C., and Mr. Silvester, for the plaintiffs, argued that there was an implied contract. The photograph was an exceedingly good one, and they could not, they said, complain of it as a libel.

Mr. Emden, for the defendant, contended that the negative was the absolute property of the defendant, and, provided he did nothing in itself unlawful, he could use it how he liked.

This morning Mr. Justice North delivered judgment as follows:—"In the month of August last the female plaintiff called at the place of business in Rochester of the defendant, a person who carries on business as, and issued by the name of, the Photographic Company, and there had her photograph taken in various positions, and for this and for photographs taken of other members of her family she paid a sum of £7 10s. The evidence is silent as to what passed upon this occasion, and therefore I infer that the transaction was one of the ordinary kind, and that no special terms or conditions of any sort were agreed upon. In November last it came to the knowledge of the plaintiffs that the defendant was exhibiting in his shop window, apparently for the purpose of sale, one of the photographs of the female plaintiff got up as a Christmas card. A copy of the photograph as originally taken, and also the copy so exhibited in the window, are now before me, and it appears that the former, which is what is commonly called a vignette, has been decorated by the addition thereto above and below the figure of scrolls of what I suppose are intended for leaves, with the superscription, also in leafy letters, of the words "A Merry Christmas and a Happy New Year." This step was taken by the defendant without any licence or consent from and without the knowledge of the plaintiffs, who had never authorised the use of the photograph by the defendant in any manner, much less its public exhibition or sale for profit as a Christmas card. They accordingly placed the matter in the hands of their solicitors, and a clerk of theirs, Mr. Andrews, subsequently called at the defendant's shop and purchased the exhibit with the above words on. There is, as usual in such cases, a difference between Mr. Andrews on the one hand, and the defendant's manager, Mr. Bax, on the other, as to what took place on that occasion; but Mr. Andrews states, without being contradicted, that he saw the Christmas card photograph fully displayed in the window, that he went in and asked for a copy of the photograph of the female plaintiff, that Bax opened a glass case on the counter and took out and offered him what Bax called an ordinary copy, being one like that in the window, but with nothing written on it, and when asked what the price was replied 2s., and that Andrews then asked for one like that exhibited in the window with the lettering on it. According to the evidence of Andrews, Bax then asked him whether he was a friend of the female plaintiff's, and on receiving an affirmative reply, continued that he could not otherwise



have let him have it, and then took the copy out of the window and handed it to Andrews, and received the price of 2s. for it. Bax's story is that when asked for the photograph in the window he said it was not there for sale, but only as a specimen with the view to obtaining orders for photographs taken in a similar manner, but that Andrews pressed for it, and that Bax asked him three separate times whether he had the authority of the female plaintiff to purchase it, and only sold the photograph to him upon his replying that he had such authority. Andrews positively denies that there was such or any conversation about an authority to purchase. Andrews also states that before leaving the shop he asked Bax whether he had any authority to sell such photographs, to which Bax replied, "Yes, to personal friends of Mrs. Pollard," and this is not denied by Bax, though I do not find anything in the evidence to justify his statement that he had such authority. I do not think it necessary to consider which version of the conversation is the more reliable or probable. The case may be disposed of upon the footing that the facts, so far as in contest, are as stated by the defendant's witness, so that the matter stands thus: when the female plaintiff's photograph was asked for, a copy was at once produced from a case on the counter and offered for sale for 2s., without any remark; it was only subsequently, when the copy in the window was asked for, that any conversation took place as to the right to sell it, and, even as to this, the defendant claims to be justified in selling it to any person who alleges that he is a personal friend of the female plaintiff's, or has her authority to purchase it, and Bax states that this is the usual custom of photographers. Bax also states in his affidavit, that immediately he was served with the writ, he removed the Christmas card photograph from the window, and it has not since been exhibited. But it will be remembered that the copy purchased by Andrews on November 9 had been taken away by him; and the copy removed when the writ was served on November 13 must have been another copy of the same photograph substituted in the window for that sold to Andrews; and it is difficult to reconcile the fact that there were more copies than one made with the allegation that the one sold was not intended for sale, but merely as a specimen to invite orders for others to be taken in a similar manner. The question, therefore, is whether a photographer who has been employed by a customer to take his or her portrait is justified in striking off copies of such photograph for his own use, and selling and disposing of them, or publicly exhibiting them by way of advertisement or otherwise, without the authority of such customer, either expressed or implied. I say "expressed or implied," because a photographer is frequently allowed, on his own request, to take a photograph of a person under circumstances in which a subsequent sale by him must have been in the contemplation of both parties, though not actually mentioned. To the question thus put, my answer is in the negative, that a photographer is not justified in so doing. Where a person obtains information in the course of a confidential employment, the law does not permit him to make any improper use of the information so obtained; and an injunction is granted, if necessary, to restrain such use; as, for instance, to restrain a clerk from disclosing his master's accounts, or an attorney from making known his client's affairs, learned in the course of such employment. Again, the law is clear that a breach of contract, whether express or implied, can be restrained by injunction—and in my opinion the case of the photographer comes within the principles upon which both these classes of case depend. The object for which he is employed and paid is to supply his customer with the required number of printed photographs of a given subject. For this purpose the negative is taken by the photographer on glass; and from this negative copies can be printed in much larger numbers than are generally required by the customer. The customer who sits for the negative thus puts the power of reproducing the object in the hands of the photographer; and in my opinion the photographer who uses the negative to produce other copies for his own use, without authority, is abusing the power confidentially placed in his hands merely for the purpose of supplying the customer: and further, I hold that the bargain between the customer and the photographer includes, by implication, an agreement that the prints taken from the negative are to be appropriated to the use of the customer only. The principles upon which I rest my judgment are well-known, of familiar application, and though I am not aware that any case has been decided as to the negative of a photograph, there are many analogous cases in the books. In "*Murray v. Heath*" (1.

Barn and Ad., 804), the owner of some drawings employed the defendant to engrave plates from them, and the defendant, having done so, struck off some of the impressions from the plates before handing them over, which impression his assigns sold after his bankruptcy. An action was brought by the owner of the drawings, founded on the Copyright Acts, and also in trover for the prints so struck. The action failed on both these heads, but Lord Tenterden said, in the course of his judgment, "The engraver having contracted to engrave the plate, and the appropriation of the prints taken from it to the use of another, an action at common law would lie against him for the breach of that contract." And, again, a little further on, "As to the count in trover, that cannot be maintained, unless the prints therein mentioned were the property of the plaintiff. But they were the property of Heath, who caused them to be taken from his own engraving, though he may be liable to an action for his breach of contract in not delivering all the prints so taken." Such contract was not express, but was implied from the nature of the employment. Again, the recent case of "*Tuck v. Priest*" (19 Q.B.D., 629) is very much in point. The plaintiffs were the unregistered owners of the copyright in a picture, and employed the defendant to make a certain number of copies for them. He did so, and he also made a number of other copies for himself, and offered them for sale in England at a lower price. The plaintiffs subsequently registered their copyright, and then brought an action against the defendant for an injunction and for penalties and damages. The Lord Justices differed as to the application of the Copyright Acts to the case, but held unanimously that, independently of the Acts, the plaintiffs were entitled to an injunction and damages for breach of contract. Lord Esher said:—

"The plaintiffs entered into a written contract with the defendant, by which the defendant undertook to make a specified number of copies of a picture which belonged to the plaintiffs, in order that the plaintiffs might be able to sell those copies for their own profit. The contract being a written one, it may be construed by the writing alone, and the plain, honest meaning of it was this: 'You are to make those copies for us, and then you are to return the picture to us, and you are not to make any other copies for your own benefit.' That term was implied as plainly as anything could be. Instead of doing this, the defendant, after he had made the specified number of copies for the plaintiffs, made other copies of the picture for himself with the intention of selling them for his own profit; and he sent a number of those copies to England with the intention of selling them there, and, what is worse, of selling them at a lower price than that at which the plaintiffs were selling theirs. That was a plain breach of contract, and under such circumstances I cannot doubt that, quite irrespectively of the Act of 1862, a Court of Equity would grant an injunction and damages against the defendant."

The Master of the Rolls then stated his reasons for coming to the conclusion that an action would lie under statute, and after doing so said:—"The plaintiffs, therefore, are entitled, under the general law, by reason of the breach of contract and of the trust reposed in him, to an injunction and damages, and they are entitled to the same injunction and damages under the statute." Then Lord Justice Lindley says:—

"I will deal, first, with the injunction, which stands, or may stand, on a totally different footing from either the penalties or the damages. It appears that the relation between the plaintiffs and the defendant was such that, whether the plaintiffs had any copyright or not, the defendant had done that which renders him liable to an injunction. He was employed by the plaintiffs to make a certain number of copies of the picture, and that employment carried with it the necessary implication that the defendant was not to make more copies for himself, or to sell the additional copies in this country, in competition with his employers. Such conduct on his part is a gross breach of contract, and a gross breach of faith, and in my judgment clearly entitles the plaintiffs to an injunction, whether they have a copy of the picture or not."

That case is the more noticeable, as the contract was in writing; and yet it was held to be an implied condition that the defendant should not make any copies for himself. The phrase "a gross breach of faith," used by Lord Justice Lindley in that case, applies with equal force to the present, when a lady's feelings are shocked by finding that the photographer she has employed to take her likeness for her own use is publicly exhibiting and selling copies thereof. It may be said that in the present case the property in the glass negative is in the defendant, and that he is only using his own property for a lawful purpose. But it



is not a lawful purpose to employ it either in breach of faith, or in breach of contract. Again, in "*Murray v. Heath*," the plates were the property of the defendant, for they had not been delivered to or accepted by the plaintiff. So in the case of the "*Duke of Queensberry v. Shebbeare*" (2 Eder, 329), the defendant was restrained from publishing a work of the Earl of Clarendon, although a person had been expressly allowed by the owner to make and retain as his own a copy of the manuscript, which copy he had sold to the defendant. There, too, an agreement or condition was implied, that the manuscript should not be published. Again, it is well known that a student may not publish a lecture to which he has been admitted, even though by his own skill he has taken a copy of it in shorthand; and the receiver of a letter may not publish it without the writer's consent, though the property in the paper and writing is in him; and many similar instances might be given. It may be said also that the cases to which I have referred are all cases in which there was some right of property infringed, based upon the recognition of the law of protection being due for the products of a man's own skill or mental labour; whereas, in the present case, the person photographed has done nothing to merit such protection, which is meant to prevent legal wrongs, and not mere sentimental grievances. But a person whose photograph is taken by a photographer is not thus deserted by the law; for the Act of 25 and 26 Vic., c. 68, sec. 1, provides that when the negative of any photograph is made or executed for or on behalf of another person for a good or valuable consideration, the person making or executing the same shall not retain the copyright thereof, unless it is expressly reserved to him by agreement in writing signed by the person for or on whose behalf the same is so made or executed. The result is that in the present case the copyright in the photograph is in one of the plaintiffs. It is true, no doubt, that section 4 of the same Act provides that no proprietor of copyrights shall be entitled to the benefit of the Act until registration, and no action shall be sustained in respect of anything done before registration; and it was, I presume, because the photograph of the female plaintiff has not been registered that this Act was not referred to by counsel in the course of argument. But although the protection against the world in general conferred by this Act cannot be enforced until after registration, this does not deprive the plaintiffs of their common law right of action against the defendant for his breach of contract and breach of faith. This is quite clear from the cases of "*Morrison v. Moat*" (9 Hare, 241), and "*Tuck v. Priester*," already referred to, in which latter case the same Act of Parliament was in question. But the counsel for the defendant did not hesitate to contend boldly that no injunction could be granted in a case where there could be no injury to property in respect of which damages could be recovered in an action at law; and he alleged that this is such a case, and replied on such decisions as "*Southy v. Sherwood*" (2 Mer., 435), "*Clark v. Freeman*" (11 Bea., 112). I have already pointed out why, in my opinion, this is not such a case; but, if it were, the alleged consequences would not follow. Supposing that the present photograph actually was or by manipulation of the negatives, or by the addition of the rest of the figure, or by the addition of a background, rendered a libel on the plaintiffs, by exposing them, for instance, to contempt or ridicule, it is quite clear that in such a case a court of law could give damages, and could also, even since the passing of the Common Law Procedure Act of 1854, grant an injunction, and ever since the passing of the Judicature Acts each branch of the High Court has the same power. (See "*Quartz Hill Consolidated Mining Company v. Beall*," 20 Ch. D., 501). The right to grant an injunction does not even depend in any way on the existence of property as alleged; nor is it worth while to consider carefully the grounds upon which the old Court of Chancery used to interfere by way of injunction. But it is quite clear that independently of any question as to the right at law, the Court of Chancery always had an original and independent jurisdiction to prevent what that Court considered and treated as a wrong, whether arising from a violation of an unquestionable right, or from breach of contract or confidences, as was pointed out by Lord Cottenham in "*Prince Albert v. Strange*" (1 Mac. and G., 25). For these reasons the defendant is wholly in the wrong, and as he denies the jurisdiction of the Court, the injunction must go as a matter of course, and as the parties have agreed that this motion is to be treated as the trial of the action, this injunction will be perpetual, and the defendant must pay the costs of the action.

The above finishes the report, and besides this there is an leading article on the case in the same issue of the *Times*,

## THE EVOLUTION OF THE CEREUS.

BY JULIUS F. SACHSE.†

PLATES 1 to 4, of this series, had been taken May 29th and 30th, for the purpose of showing the general position of the buds and characteristics of the plants. On the afternoon of the last-named date, when there seemed to be every indication of an opening of the bud, the camera was placed in a favourable position and screwed down securely. In this position plates 5 to 10 were taken of bud I., specimen "A," at the interval of fifteen minutes; the first of these exposures being made at 5 o'clock p.m., the bud then showing the first marked signs of expansion. Plate 6, made at 5.30, shows an expansion of about three inches. Plates 7, 8, and 9 show expansion of  $2\frac{1}{2}$ ,  $3\frac{1}{2}$ ,  $3\frac{1}{2}$  inches respectively, during the intervals of fifteen minutes, which intervened between the exposures. The plates used in these experiments up to this stage of the investigation were the ordinary Carbutt B-16 sens.—as sold by all photo. stock dealers. Plates 9 and 11 were "Special Orthochromatic" (25) from the same maker. The superiority of these plates over the others for this work was clearly demonstrated. The latter plate (11) was made at 7.30, by the aid of magnesium or "Blitz-pulver." 35 gr. of the compound were used for the purpose. The picture shows this monarch of its genera in all its glory, the flower being fully expanded, the sepals recurved, and measuring a trifle over fourteen inches in diameter.

Plate 12, also made by the aid of the "magnesium flash" just before the break of day (4 a.m., May 31st), shows the flower in a state of collapse, after its mission had been fulfilled, and the mysterious vital force or power had been expended; the drooping flower measured about two inches longer than the bud on plate 6, at 5.30 p.m., showing that there had been a considerable increase of fibre-cellular tissue and solid matter during the time in question.

It had been the intention of the experimenter to continue the exposures by the aid of the magnesium, at the same intervals, after plate 11 was made, and thus showing the various stages through which the flower passed, until it reached the final collapse; but as objection was made, in the fear that the smoke or gases evolved from the magnesium might injure the other plants in the greenhouse, the writer had to content himself with the few which he was permitted to make, and are here described.

Buds II. and III. also on specimen "A," developed on the following day, June 1st, 1888. Unfortunately the writer was prevented by other business from observing the early stages of their development. On arriving home at 6.30 p.m., it was found, much to the chagrin of the observer, that both flowers were in full bloom. Plate 13, of bud II., was made with as little delay as possible, at 7 p.m.

Plate 14, showing both flowers, 2 and 3, in all their beauty, was made at 7.20 p.m. Both of these plates, unfortunately, were slightly light-struck—caused by a defective plate-holder. By this time the twilight had set in, and became too weak for further exposures. An attempt was now made to obtain a full front view of bud II., with the aid of "Blitz-pulver." The result of this was plate 15, made about 7.45, the grand picture shown in the accompanying illustration. The last four plates were the "Carbutt Special" (25)s.

It will be noticed that in plates I and 4, bud IV., on specimen "B," was no larger than an ordinary hazel-nut. The bud showed but little sign of life during this time, until about the latter part of the week, June 7th, when the bud had expanded to  $3\frac{1}{4}$  inches in length, and at 5 p.m. the first plate, No. 16, of this series was made. Careful measurements were now made of the growth every night and morning, with the curious result, showing that, although the plant is what is called a night-bloomer, all the growth and development was between sunrise and sunset, there being absolutely not a particle of growth registered during the night. Plates 17 to 23, taken at an interval of twenty-four hours (5 p.m.), show the daily growth to have been  $\frac{3}{4}$ ,  $\frac{1}{8}$ ,  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{1}{4}$ ,  $\frac{1}{4}$ ,  $\frac{1}{4}$ , and  $\frac{1}{4}$  inches respectively.

Exposures 16 to 22, June 7th to 13th, were made with a camera in the same position, the lens being about seventeen inches from the bud. These plates show the growth and gradual inclination of the bud. June 14th, the spiral motion or revolution of the bud, preparatory to the final expansion of the flower, commenced. The camera was here changed, so as to bear upon the bud as it turned. Plate 23 was made at 3 p.m., plate 24 at 4 p.m. The bud had now reached a total



length of ten inches, viz., the bud proper,  $4\frac{1}{4}$ ; the stem or tube,  $4\frac{1}{4}$ ; the bulbous base,  $1\frac{1}{2}$  inches. In the meantime the sky had become overcast, dark, and cloudy to so great an extent, that the experiments for the day were reluctantly abandoned. June 15th, at 6 a.m., plate 25 was made, from a point opposite from which the other views were taken. Plate 26 was made at 3.15 p.m. of the same day, the bud having now reached the proper position for its final evolution.

After the turn of the bud was complete, the camera was re-adjusted so as to bring the bud within the scope of its focus; on the following day, June 16th, the bud curved a trifle upwards, and gave every inclination of opening about sunset.

At 3.45 p.m., plate 28 was made. The total length of the bloom had by this time increased to  $12\frac{3}{4}$  inches, being a growth of  $1\frac{1}{2}$  inches within the last twenty-four hours; the bud proper had grown fully an inch within the last forty-eight hours—*vide* plate 24. To add to the difficulties which beset the operator, the afternoon was destined to be dark and showery, the light proving almost useless for making photographic exposures.

Notwithstanding this great drawback, exposure 29 was made at 5.45 p.m., the plant showing great reluctance or lack of force to reach the final culmination; although this plate shows a considerable swelling of the bud, the slow and retarded development made it very unsatisfactory for the experiment. Shortly after 6 p.m., the position of the camera was again slightly changed for the last time, to suit the droop of the unfolding flower. This change brought the lens to within twelve inches of the flower. The weather was now very dark, a heavy shower falling. At 6.30 p.m., exposure No. 30 was made on a Carbutt "B," lasting thirty seconds, with a medium stop. At the expiration of fifteen minutes, plate 31 was made (6.45 p.m.), the shower by this time had passed, and it became a little lighter. Exposure 32 was now made on a special 25, with medium stop (7.00 p.m.), lasting about twelve seconds. The result of this exposure was a fine, soft plate. Notwithstanding the breaking of another heavy shower, the 33rd was promptly exposed at 7.15 p.m. for fifteen seconds, using a larger stop. Plate 34 was made 7.30 p.m., under the same adverse circumstances; the time here was increased to about twenty-five to thirty seconds. The light by this time had almost totally failed. However, at 7.45 p.m., the 35th plate was exposed, but without any hope of success. The attempt was made with an open diaphragm, and the cap was kept off about a minute.

For some unknown cause, presumably the atmospheric condition, the bud did not expand or develop into a complete flower, consequently the experiment from which so much had been expected by the sanguine observer proved a partial failure, after half an hour had elapsed from the time when the plate last described had been made. Exposure number 36 (Carbutt Orthochromatic 25) was made by the aid of thirty-five grains of "Blitz-pulver." This plate was, unfortunately, partly spoiled after its development. Further investigation was now abandoned in the hope of better success in the development of the fifth and last bud. Here the writer was again doomed to disappointment. The bud was found next morning broken off on the bench beside the stem.

After the plates were developed and examined, it was found, much to the surprise of the experimenter, that some of these plates, notably 24, 26, 28, 29, 32, 33, 34, and 35 had perceptibly registered the growth and expansion of the sepals, and that even the actual tremor of the flower in its eagerness for development was shown on the sensitive plate in a truly wonderful manner within the time of exposure, lasting in most cases from ten to thirty seconds. On plate 35, where the exposure lasted about one minute, an examination will plainly show the movement or growth of every sepal or petal in the flower.

Special attention is called to plates 33 and 34 in the accompanying illustration. It will be observed that although greatly reduced, the outward growth or movement of the pistil is plainly visible in the picture. A comparison of the position of the inner and outer sepals of these two representative plates clearly shows the changes and evolution of the bursting bud within the interval of fifteen minutes, while the registered growth of the pistil on one plate (33) was recorded within almost less than that number of seconds. This fact alone is a great triumph for photography, and the discovery of the possibility of registering the natural growth or development of plant life by the aid of sensitive gelatine plate in the camera within twenty seconds of time, certainly opens a wide field for future investigation and discoveries.

It is to be hoped that these experiments, crude and unsatisfactory as they are, may yet be found important enough to attract the attention of other and abler students in this line of research and result in the further development of the great possibilities of the camera in this field of biology, and thus add to our stock of knowledge by unfolding the mysteria and secrets of the great Book of Nature so wonderfully instanced in the Evolution of the Cercus.—*From the American Journal of Photography.*

#### ON THE MEASUREMENT OF THE SENSITIVENESS OF SILVER SALTS TO THE SPECTRUM.

BY CAPTAIN W. DE W. ABNEY, C.B., R.E., F.R.S.\*

TABLE IV.

Edwards' Isochromatic Plate.

Scale No.	Sector Reading.	Opacity.	Relative Sensitiveness.	Scale.	
				Time of Exposure.	Sector Reading.
5	130	8	2	0	138
6	128	10	3	5	120
7	120	18	5	10	104
7½	112	26	7	15	88
8	106	32	9	20	72
8½	100	38	11	25	56
9	75	63	19	30	44
9½	63	75	22.5	44	30
10	50	88	27.5	50	22
10½	46	92	29	60	16
11	50	88	27.5	80	42
11½	66	72	22	100	29
11½	78	60	18	120	22
12	90	48	14.5	180	16
12½	74	64	19.5		
12½	53	85	26.5		
12½	26½	111½	44		
13	17½	120½	57		
13½	6	132	102		
13½	5½	132½	115		
13½	6½	131½	106		
14	10	128	83		
14	63	71	22.5		
14½	120	18	5		
15	138	0	0		

TABLE V.

Edwards' Isochromatic Plate treated with Cyanine.

Scale No.	Sector Reading.	Opacity.	Relative Sensitiveness.	Scale.	
				Time of Exposure.	Sector Reading.
5	96	10	2	0	106
6	92	14	2.5	5	79
7	79	27	5	10	57
8	64	42	8.5	15	40
9	42	64	14	20	28
9½	32	74	18	30	16
10	23	83	23.5	40	10
11	19	87	26.5	50	7.5
11½	23	83	23.5	60	6
11½	29	77	19.5	80	4
11½	36.5	69.5	16	90	3
12	39	67	15.5		
12½	33.5	72.5	17		
12½	26.5	79.5	21		
13	18	88	27.5		
13½	11	95	38		
13½	6¾	99¼	55		
13½	7	99	53		
14	9	97	44		
14½	9	97	44		
14½	6¼	99¾	58		
14½	5½	100½	63		
15	10	96	40		
15½	24	82	23		
15½	41	65	14.5		
15½	71	35	7		
16	86	20	3		

\* *Journal of the Photographic Society*, continued from page 841 of P.N.



TABLE VI.  
Chloride Plate treated with Erythrosin.

Scale No.	Sector Reading.	Relative Sensitiveness.	Scale.	
			Time of Exposure.	Sector Reading.
1	250	.2	5 min.	22
2	240	.45	4 "	93
3	232	.8	3 "	27½
4	208	1.4	1 "	57
5	192	2.0	½ "	83
6	176	3.0	¼ "	108
7	220	1.0	¼ "	132
8	245	.25	5 sec.	150
9	256	0	3 "	176
11	256	0		
11½	192	2.0		
12	160	4.5		
12½	128	8.0		
13	84	30.0		
13½	66	46.0		
14	99	20.0		
14½	192	2.0		
14¾	220	1.0		

I may also say that these accurate measures have aided me much in confirming the theory of orthochromatic photography which I hold. That I do not propose to enter into now, as it would not be germane to the paper, and would needlessly open the road to discussion on a bye issue.

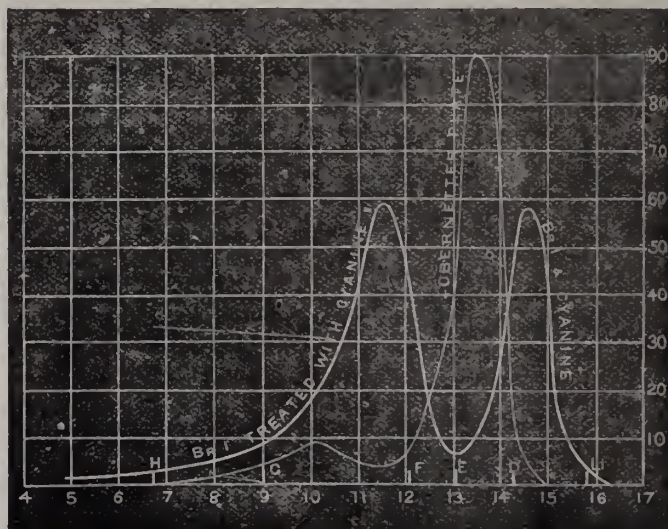
I would once more reiterate that the question of the position of maximum effect of the spectrum on the different salts is not affected by the light used, since there is no discontinuity, or sudden increase, or diminution in intensity at any adjacent parts of the spectrum.

TABLE VII.

Bromo-iodide Plate treated with Cyanine.		Obernetter Plate.		Bromo-iodide Plate, stained with ⅓ Cyanine and ⅓ Erythrosin mixed solution.	
Scale No.	Relative Sensitiveness.	Scale No.	Relative Sensitiveness.	Scale No.	Relative Sensitiveness.
7	2	7	½	6	2
8	5	8	1½	7	3
9	8	9	5	8	7
10	18	10	9.2	8½	10
10½	26	10½	8.5	9	15
11	41	11	8	9½	22
11½	58	11½	5.5	10	40
12	50	11¾	5	10½	54
12½	35	12	6	11	60
12¾	21.5	12½	10	11½	62
13	8.5	12¾	12.5	11¾	60
13½	6.5	13	25	12	38
14	7.5	13½	38.5	12½	25
14½	9.0	14	90	13	13
15	13.5	14½	85	13½	13
15½	16	15	63	14	18
16	38	15½	25	14½	40
16½	58	16	0	15	48
17	54	16½	...	15½	25
18	38	17	...	16	12
19	10	18	...	16½	10
20	6	19	...	17	12
...	...	20	...	17½	5
...	...	21	...	18	2

Shown ½ scale for Ordinance in Fig. 6.

Fig. 7.



In fig. 7 we have an Obernetter plate and a bromo-iodide plate treated with cyanine. Cyanine by itself is difficult to work, as a sort of fog is induced. When mixed with erythrosin, it is clean in working. An Obernetter plate is said to contain a small portion of cyanine.

Another point I may bring before the Society is the value of attaching a scale to a photograph, by the plan I have described, in forming a right judgment of orthochromatic effect. Given the luminosity of colours (the method of measuring which I have already described before the Royal Society, and a modified plan for which I am about to describe to the Physical Society), it is easy to ascertain the sensitiveness of a plate for different colours. Such a plate I produce before you. It was made by photographing the accompanying diagram of four colours—ver-

million, emerald green, gamboge, and French ultramarine—with a lens coated with turmeric. Part of the plate was covered up during its exposure to the colour diagram, and then portions of this covered part were exposed for varying times to the light of a lamp, as already described. The luminosities of those four colours, taking white at 100, are—40, 41, 82, and 9, leaving out fractions. On an Edwards' isochromatic plate (fig. 9) stained subsequently with cyanine, the sensitiveness of the plate to these different colours was—white, 100; vermilion, 28; green, 30; yellow, 75; blue, 0.

With an ordinary isochromatic plate (fig. 8) taken through the same medium, the values were—white, 100; vermilion, 26; emerald green, 48; gamboge, 56; French ultramarine, 12.

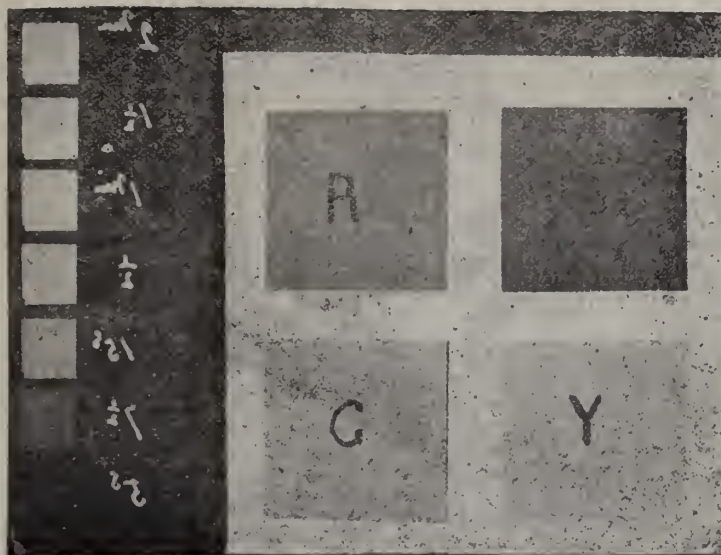


This shows that the cyanine-stained plate more nearly approaches truth than does the ordinary isochromatic plate.

For experiments in orthochromatism I recommend these four colours to your notice. If a plate be sensitive to these in

approximately the same ratio as their true luminosities, it will be so for all colours. This, of course, applies only to sensitiveness, for it must not be forgotten that the proper ratio of sensitiveness does not always indicate proper ratio of density of deposit, nor

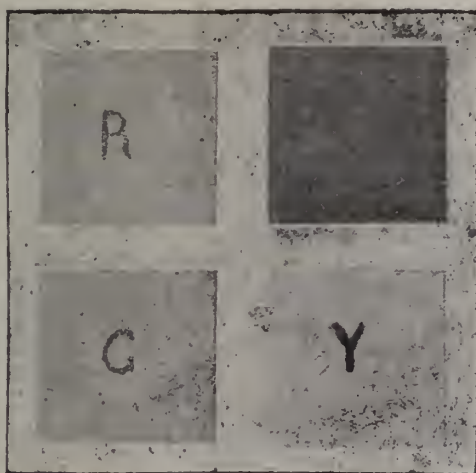
Fig. 8.



does the proper ratio of density of deposit indicate proper ratio of darkness in a print.

In conclusion, I venture to be bold, and to say that the accurate methods of measuring density of deposit in negatives, and

Fig. 9.



the conversion of density into a measure of sensitiveness, and of measuring of shades of darkness in a print, which I have at various times brought before the Society have placed in the hands of scientific men a plan of attacking many weighty astronomical and other problems by photography which before was wanting. From a qualitative examination of a negative from which only an approximate estimate of light acting can be formed, a quantitative measure can now be insured. I think, for instance, that this will be a plan that must in the future be adopted in eclipse expeditions for estimating the light of the corona, and for the determination of the spectrum value of the light of stars, more especially when an orthochromatic plate has been employed.

## INSTANTANEOUS STUDIES.

### PHOTOGRAPHY IN COLOURS.

*Gullible Sitter (usually a lady).* Is it really true, Mr. Bunkholm, that you have discovered how to photograph in natural colours?

*Mr. B.* Well—er—not precisely, but very near. You see, what we photographers are trying to do is to assist—er—nature.

*G. S.* Oh, yes. How interesting! Nature is so false; don't you think so?

*Mr. B.* Certainly. Now here you see the photograph of a young lady who is of a pale complexion; but by my system of natural photography in colours I am able to impart that delicate pink hue which Nature, doubtless, intended, but from some lack of power is unable to give.

*G. S.* How charming! And how is it done?

*Mr. B. (smiling).* Well, that is my secret, which I can assure you I have spent twenty years of hard work to discover. But I can tell you the principle. Every object, you know, has latent colours.

*G. S. (not comprehending in the least what Mr. B. means).* Of course.

*Mr. B.* My secret consists in the bringing out of these latent colours, and thus making good the defects of Nature.

*G. S.* Oh, yes! I see.

*Mr. B.* It was in making some experiments with polarised light that I accidentally made this wonderful discovery.

*G. S.* You don't say so. And what is polarised light? The light that comes from the north star, or north pole, or something—isn't it?

*Mr. B.* H'm—not exactly. If I were to explain, you probably would not understand. The subject, in fact, is rather abstruse. But just to show you what photography in colours means, I will ask you to look at these colours, which have been obtained by the spectroscope.

*G. S.* Oh! the spectre-scope—something to do with Pepper's ghost, isn't it?

*Mr. B.* H'm—not precisely. There are certain colours



which make up white light. Now if when photographing white light you resolve this white light into all these colours, and get them on your negative, you photograph in natural colours, don't you?

*G. S.* Oh, clearly; and that is what you do, is it?

*Mr. B.* I'm, not absolutely, but it is on the same principle. You must pardon me if I do not enter into further particulars. It touches my secret very nearly indeed.

*G. S.* Oh, I beg your pardon, I'm sure! I did not intend to—to—

*Mr. B.* Pray don't mention it. I was about to show you some samples of my discovery. This is our fifty shilling style. You see we get the natural tint of the cheeks and lips, but the eyes are untouched. To have the eyes naturally tinted as well entails a more difficult and more sensitive process.

*G. S. (profoundly impressed).* Naturally it would. And how much are the heads when entirely coloured?

*Mr. B.* We charge £5 for a fully coloured head in which the tints of nature are successfully and accurately reproduced.

*G. S. (hesitating).* I would give you an order at once, but I am doubtful about one thing.

*Mr. B.* Pray let me know, madam. I am only too glad to meet with objections. I can assure you my discovery has excited the jealousy of the entire profession.

*G. S.* Oh, it isn't that. It is something that concerns myself. In fact, I hardly like to tell you. And yet—well, it is just this. Some time ago I—I—I had my hair made golden. Now you must promise never to tell a single soul, because no one has the least suspicion.

*Mr. B.* Your secret is safe with me, madam; but may I ask what this has to do with my process of photography in natural colours?

*G. S.* Well, my hair being originally black, I was afraid that as black was the natural colour, it would come out black instead of golden, as I want it to be.

*Mr. B.* Make yourself perfectly easy on that score. Your hair will be of the exact hue as I see it now.

*G. S.* Then I will have a coloured photograph.

*Mr. B.* Excuse me, a photograph in colours.

*G. S.* Yes, that's what I mean, of course.

[*Exeunt to Studio.*]

## Notes.

There has been much talk about the American celluloid films and their uses, both to the tourist and the workers at home, and numerous enquiries have been made as to the blank celluloid films ready for coating. We find that the British Xylonite Company, of High Street, Homerton, is supplying transparent films polished on both sides, and a trifle thicker than the American films, at a cost of five shillings a dozen for whole-plate size.

A trial shows that gelatine emulsion does not spread or adhere so satisfactorily to the polished surface as to the slightly roughened celluloid used by Mr. Carbutt; but gentle friction with a pad charged with the finest pumice powder soon gives the necessary roughness.

Numerous photographic uses should be found for the clear sheets of celluloid. It may be useful for covering photographs, just as talc is sometimes used; also for making removable masks to cut off portions of negatives—gelatine being badly suited for this use, as it so readily alters its dimensions by damp.

The copyright question in a new phase was discussed before Mr. Justice Kay on Friday last. In order to make a photographic advertisement of a dressholder more attractive, the head of a figure displaying the dressholder was replaced by a head of the Princess of Wales, taken from a copyright portrait published by the London Stereoscopic Company. The result was an injunction prohibiting any more of the sort of combination photography, and an order to give up all copies.

An exhibition of photographs is to be held in the Queen's Park Museum and Art Gallery, Manchester, in February next. Frames must be sent in between Monday, Jan. 7th, and Monday, Jan. 14th, to the Curator at the above address. Sales can be arranged for the exhibits, authorities taking ten per cent. commission. All communications respecting the Exhibition of Works, or their sale, must be addressed to Mr. Charles George Virgo, The Curator, Queen's Park Museum and Art Gallery, Manchester.

Among the Christmas numbers illustrated by photography must be mentioned the holiday number of the *St. Moritz Post*, which is the organ of the English Colony of the Engadine winter resorts. It contains the large collotype prints of St. Moritz in Winter, and Maloja in Winter from Mrs. Main's negative, and Davos-Platz in Winter from a negative by Mr. W. Nurton.

A very interesting article by Mr. William M. Rosetti appears in this month's *Magazine of Art* on the portraits of Dante Gabriel Rosetti, and is noticeable for the importance which the writer appears to attach to the photograph of his brother. One photograph of the latter was taken in 1853 by a landscape painter named Mark Anthony, who says Mr. W. M. Rosetti, had taken up photography with zest, and was particularly happy in catching with his lens momentary aspects of childish expression, and produced many charming memoranda of his three little daughters. Six photographs were the work of Mr. Lewis Carroll, the author of "Alice in Wonderland," who was a very skilful amateur, and took an amicable pleasure in levelling his camera time after time upon the painter's form. Of one of these photographs Mr. Rosetti makes a remark which is worth remembering for intending sitters. The painter happened to be in a new suit of clothes just at this time, and the waistcoat, not yet thoroughly adapted to his shape, shows an unsightly plait right across the chest. The moral of this is evident. Mr. Rosetti then passes on to make a second comment of which photographers might take heed. The likeness, he says, is extremely good and agreeable, but the surface of the face must have been somewhat smoothed down of late years after the objectionable fashion of professional photographers. Other photographs taken in the ordinary business way are also minutely described, but do not call for note here.

At the last meeting of the Royal Astronomical Society, some enlargements by Mr. Isaac Roberts from photographs he has taken of the Dumb-bell Nebula and the great Nebula in Andromeda were exhibited, and excited much



attention, since they show new details of nebula structure which have hitherto not been seen by eye-observers, and have been too faint to be registered on previous photographs. The probable result of the study of these photographs was pointed out by Mr. Norman Lockyer, who said that, provided they were sustained by sufficient cometic enquiry, they would enable astronomers to determine, in a few years, the number of miles each meteorite of the swarm was distant from the surrounding ones.

The artist who undertakes, at the request of a gentleman, the portrait of a lady in whom the gentleman takes an interest, incurs a very serious responsibility. The *Army and Navy Journal* of New York relates how Lieut. G. M. Honey gave a cabinet photograph of a lady to a portrait painter for enlargement. When the portrait painter returned with the enlarged picture the gallant lieutenant thought it was anything but flattering to his lady friend, and refused to accept it. He handed the painter two and a-half dollars for his work, and tore the painting to pieces. The artist demanded six dollars and a-half, and muttering something about Honey being no gentleman, found himself the next moment sprawling on the deck; and he appears to have valued the assault at a higher rate than the painting, and asked for 299 dollars by way of compensation, a claim which the law courts will have to decide.

The moral of this little incident is plain. The artist or photographer who accepts such a commission must be careful to ascertain from his customer what he admires most in the lady's face. Love—or lovers, much about the same thing—is proverbially blind, and can detect beauties which are invisible to uninterested eyes. Whether these beauties exist or not does not matter very much; it is the duty of the artist, if he wishes to preserve his peace of mind and whole bones, to find out what they are.

The connection which Daguerre had with the preparation of panoramas must always make the subject interesting to photographers. It is not generally known that their invention is due to a Scottish artist, Robert Barker, who, while in prison for debt, attempted to read a letter by the light that came through the tiny loophole of his cell, and was struck by the singular effect of the illumination on the paper. When released from gaol in 1796 he exhibited the results of his studies in a picture artificially illuminated. Three years later he brought out a panoramic picture of London which had a great success and attracted the attention of Robert Felton, who took out a patent for it in France. In 1810, Napoleon, who had a genius for artistic advertising, conceived the notion of turning the panorama to account in his own interest, and ordered the architect, Cellerier, to prepare a scheme for seven panoramas representing his victories, and these panoramas he proposed to be carried about and exhibited all over France. The plan, however, was never carried out, for Napoleon was captured and sent to Elba before it could be matured. Panoramas in France have been always popular, and could be made equally so in England. If the Political parties of

the present time were to imitate Napoleon's astuteness, each party might find some very powerful arguments in a panorama representing, say, an eviction.

The critics have risen, if not in rebellion against, at least in remonstrance with, the authorities of the Royal Academy. The gentlemen who have to "do" the notices of the pictures complain—and it must be confessed with justice—of the wholly inadequate time allowed them to inspect the contents of the ten galleries. There is but one press day, and to properly pass in review upwards of two thousand pictures in the limits of that one day is obviously impossible. Hurried notes are made of as much as the critic can get, and the rest he has to leave to the public days, when, what with the din of tongues, the heat, the dust, and the crowd, criticism is almost impossible. The gentlemen who have addressed the "Forty" on the subject have asked for three days for the press, a request which we do not think will be granted. If we may judge from Mr W. P. Frith's recently published reminiscences, the R.A.'s—at least, those of the old school—are not particularly fond of the press.

### DESIGN.

BY WALTER CRANE.\*

In dealing with surface spaces or panels, friezes, lunettes, pilasters, and the like, these being all strictly architectural in origin, the designer feels bound to respect both his surface and his boundaries, and in making designs to fill them, should naturally have due regard and relation to them. He does not wish to cut a hole in his wall, as it were, and by all the resources of pictorial skill fasten your attention upon something accidentally seen through it. He wishes to dwell on the architectural character of his conditions, to acknowledge and emphasize the character or proportions of the space he has to deal with, and never try to induce you to forget that he is decorating a surface. Of the perfect union of this controlling architectural sense with the most delicate and varied artistic and sculptural feeling controlled by the rhythm of design, we must still point to that example of examples—the frieze of the Parthenon. But that frieze, though a thing of beauty seen as we see it only in fragments, and torn from its proper architectural framing, owes its character not only to the object and position for which it was designed, but also to the temper and spirit of the people of which it was the expression.

And this shows that the beauty of the most beautiful art is, after all, relative. What shall we say if any one proposed to place the frieze in Westminster Abbey, or outside of it? What barbarity! Yet here are two religious and monumental works, both beautiful, and yet of a beauty and sentiment so divided in time, so different as to be incongruous. Re-establish the lost links of chronological connection, however, and you would get harmony again. Everything, therefore, is relative in design—nay, in all art.

I have spoken of the necessity under which the designer works of systematizing his forms and emphasizing their characteristics. In this he differs from the painter as, in an analogous sense, the method of speech and delivery necessary to effect on the stage differs from the ordinary conversational pitch. In the designer's case the degree of naturalism being determined, apart from personal predilection, by three important considerations:—

1. The object to which the design is to be applied.
2. The materials in which it is to be executed.
3. The conditions under which it will be seen.

In painted decorations the imitative facility of the material leaves the designer comparatively free. He is only controlled by architectural considerations. In fact, superficial naturalism of effect is rather the snare to be guarded against, since in decoration we do not want the attention to be distracted by bits of literal imitation done for its own sake, and unrelated to the

\* Continued from page 789.



general scheme of line and colour. No hard and fast line, however, can be drawn here, and there is always a large margin for individual feeling and judgment. It is, however, an ascertained fact that darkly shaded figures modelled up to full pictorial relief, and chiaroscuro, with all complexities of foreshortening, do not make good ornament, and the main business of a decoration designer being to ornament, he has little to do with such methods of representation. These are obvious reasons, too, why the attempt to give the superficial facts and effects of nature in a decorative design is not successful. The main and controlling scheme of line, the clear silhouette, and counter-balance of masses, which are of the first importance, are sure to be confused and obscured by such a treatment, and that fair and frank system of colouration on which so much depends—that ornamental treatment of detail, and rich filling of interspaces must necessarily be interfered with directly they cease to be our chief care in design. They must necessarily suffer when a new aim becomes paramount; and in aiming at pictorial force and literal accuracy of representation, these, and many other valuable qualities must be sacrificed, to say nothing of those suggestions of romance, poetry, and imagination which are associated with dreams and emblems, and figurative and suggestive rather than literal methods of expression.

It is certain, whether we look to classical or renaissance times, we find the struggle of art to lose itself in superficial naturalism preceding debasement and decay of all design.

The real controlling element in design in decorative painting is on its architectural side, its relation to the wall or panel it decorates, its lighting and position. Such considerations as these determine its form, and it is by meeting and acknowledging such conditions that it gains its peculiar dignity and impressiveness, as we find it exemplified in the churches, palaces, and municipal halls of Italy, where its greatest triumphs have been achieved.

Turning from painting, which is least controlled by its material and conditions, perhaps, than other branches of decorative design, we shall find this necessity of adaptation and control of conditions of material greater.

Although, in some cases, it is possible that a design may be so constructed as to be adaptable to execution in more than one material, as a general rule, the peculiar conditions of each process of handicraft has to be allowed for, and a design becomes successful over and above its distinction on grounds of imagination and draughtsmanship, in proportion as it becomes perfectly adapted on the material in which it is carried out. In proportion as the designer has realized his design already in its proper material, whatever it be, and has felt, as the case may be, the ductibility of the metal, and its capacity for "agreeable bossiness"; or the crispness of the wood carving; the set of threads in the warp of the loom; the emphasis of the embroiderer's needle; the plastic clay of the modeller; the jewel-like tesserae of the mosaic work and the leaded glass; the architecture of the printed page; the soft relief of the stamped leather, or the clear gold tooling of the bookbinder.

All these crafts, by the necessities of their existence, impose certain conditions upon the designer, which he cannot afford to lose sight of for a moment, and yet these very conditions give their own particular charm and character to the design as long as they are frankly acknowledged, and that imitative counterfeiting spirit does not intrude—like the snake into paradise—which would persuade everything to try and look like something else. When the sculptor devotes his skill to tricks that can only be done by the painter, and which even he should be sparing of; when the painter would emulate the effects of the stage; when the mosaic worker tries to make his mosaic look like painting; and the embroiderer and the tapestry worker aim in the same direction; when the wood carver tries to cut every feather on a dead bird, and forgets all about the ornamental effect and meaning of the design; when the cotton printer ties up branches of artificial flowers (from Paris) with artificial ribbon, and squeezes them on to his chintzes; and the paper stainer goes and does likewise—then, well, then we may know by the same tokens that both the arts and the crafts are in a bad way.

All this points to the conclusion that the designer, if designer pure and simple he is forced to remain, must never lose touch with the craftsman. It would be well, indeed, if he practised some craft himself, as the technical conditions, peculiarities, perhaps difficulties, he would be sure to encounter would tell him more than any words about it; and the practical experience

and suggestion gained would certainly re-act most favourably upon his power of design. Nothing wears a man out so much, or deadens and narrows his perceptions, as monotony of employment. "Fresh woods and pastures new" are as essential to the artist and craftsman as to the poet.

Fine sensitiveness to beauty, quick imagination, or play of fancy, will not spring out of dull and depressing surroundings, or from the conditions of mechanical toil, any more than flowers will bloom bereft of sunlight and air. If all things must be sacrificed to the paramount importance of buying and selling, and profit making, and interest yielding, including the beauty of cities, as well as the beauty of wild nature, do not let us speak of art; or let us at least bear in mind that though we may try by means of forcing-houses to bring the tree to new or an artificial fruition, we are all the time destroying its roots in the life of common humanity and common handicraft; whereas, before the evolution of our industrial epoch, of subdivision of labour, machine industry, and centralised markets, the craftsman was his own designer; handicraft, in fact, did not exist apart from art, and the workshop training and apprenticeship was common to them all. Thus, a painter began as a colour-grinder, and went through all the technicalities of the studio or workshop before he became its master because master of these. The system is so obviously sensible and sound that it seems strange it should ever have been departed from, and in fact only was broken up by the pressure of the modern commercial system and the domination of the money-making ideal.

Some few crafts here and there, closely connected with the humbler and less changeable conditions of the life of the people, have retained their primitive distinction and appropriateness, and remain instances of perfect adaptation of design to material—such as the brass ornaments of cart and waggon horses, both in this and other countries, which are often beautiful, however simple in design. The common copper water vessels of the Italian peasantry, and the embossed brass milk cans of Antwerp, are other instances of how much beauty may linger on in the unregarded life of the hewers of wood and the drawers of water. But alas! the tourist comes by; a brisk manufacture for profit is started; toy models are made of such humble things for the drawing room table, and the charm is lost.

In such things as these I have mentioned there is no attempt to be fine, or to get outside the material or its purpose, and shout, "How clever I can be!" which has been the snare of so much post-renaissance art. And this is peculiarly the danger we are liable to when the designer is wholly disassociated with and independent of the craftsman. Pursued by the Nemesis of commercial competition—the demand for bogus novelty—the designer whips up the jaded Pegasus of his ingenuity, and devises something to catch the superficial eye and the penny of an indifferent because uninterested public, rather than a design fitted to its material and object in which he takes a personal interest and pleasure. And so, instead of serviceable and suggestively-decorated cupboards and cabinets, tables and chairs, we often get fantastic pieces of architecture in wood, which it would be unwise to keep for show, and which will not stand the test of use. It was due to the influence of the same conditions, and the false taste which an artificial life engenders, that full-blown roses in high relief would bounce at us from our chintzes and carpets, and popular pictorial prints would try to struggle through the meshes of an antimacassar.

"Ah, well!" you will say, "we have passed all that. We are no longer in the year '51, or under the spell of its great exhibition of the degradation of design. We have escaped from the armies of the Philistines."

I sincerely hope so. But I confess I do not altogether feel sure of it sometimes—say, in the neighbourhood of the Tottenham Court Road. We have not, I am afraid, escaped out of the jaws of commercial competition, which ruthlessly pursues its way, and we become, in consequence, more and more dependent on the work of machines, or of human beings turned into machines, which, so far as they touch anything in the nature of art—that is, art which depends for its charm upon the personal element—certainly rob it of its variety and beauty and individuality, and, therefore, of its interest. What would be done to a speaker or musician who kept on repeating the same set of words, or the same phase in music without variation? Yet this is precisely what happens in another way with a piece of ornament mechanically reproduced by machinery. Yet I am far from saying there is no place for machinery in art; although the machinery of the artist or craftsman is generally of the

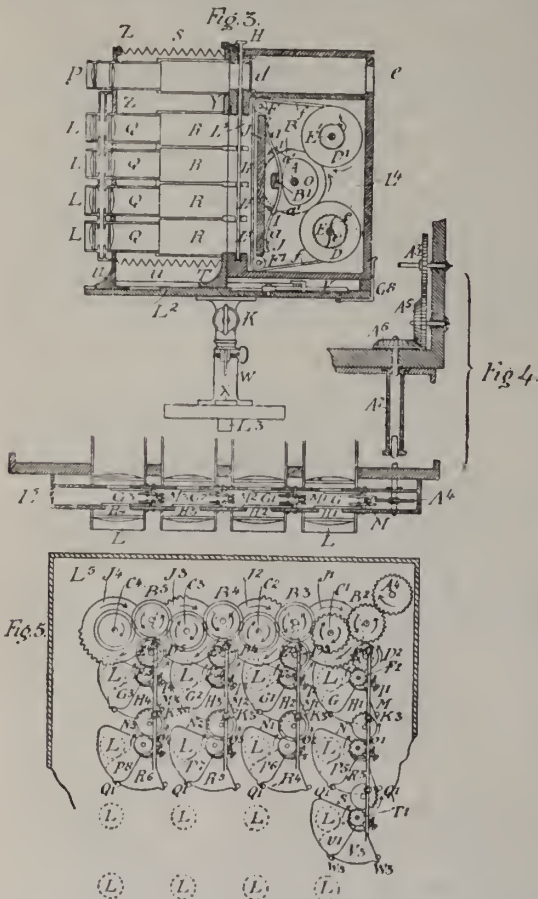






fig. 1 is a front elevation and fig. 2 a horizontal section of the receiver; fig. 2<sup>a</sup> is a diagram illustrative of the working of parts of the same; fig. 3 is a vertical section of the same; fig. 4 is an enlarged horizontal section, and fig. 5 an enlarged vertical section of parts of the same; fig. 6 is a view partly in side elevation and partly in vertical section, of the deliverer, and fig. 7 is a diagram illustrative of a modification of part of fig. 5. Like letters of reference indicate like parts throughout the drawings.

At fig. 1 I have represented a receiver which has a series of sixteen objectives *L*, fitted to the shutter box *L*<sup>1</sup>, in front of the bellows *S*, supported by the table *S*, supported by the table *L*<sup>2</sup>, and movable upon feet *U*, by means of the lever *V*. In the lower part of the figure the joint *K* and friction sleeve *W* are represented in vertical section, the arrangement being such as will allow the receiver to be rotated upon the pivot *L*<sup>3</sup>, and to be inclined backwards and forwards by slackening the wing nut

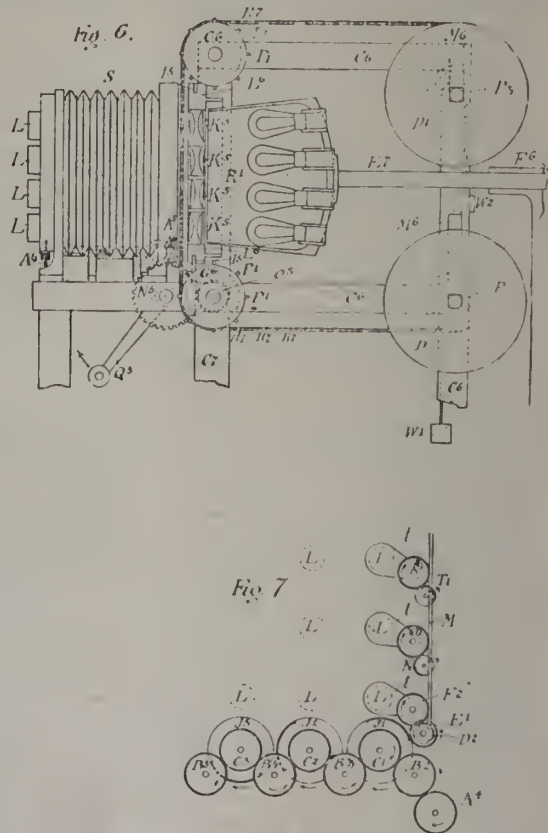


*K*<sup>1</sup>. *X* indicates a spirit level. The two lenses *P* at the upper part serve for focussing purposes, the necessary means of adjustment being provided by the before-mentioned lever *V*. By having one or more lenses, such as *P*, independent of the photographic lenses *L* solely for focussing purposes, the operator is enabled to adjust the focus to the object whether it be in motion or not, and even while the exposures are being made. *H* is a sliding shutter in the box containing the mechanism.

At fig. 2 is represented the arrangement of the objectives and their tubes (*Q*), which are movable in the tubes *R* for focussing purposes. In the case *L*<sup>4</sup> is mounted the driving shaft *A*, provided at its extremities with two toothed segments or mutilated wheels *B* *B*, which transmit motion alternately by means of the wheels *C* *C*, to the lower drums *D* *D*, movable upon the stationary shaft *E*.

Fig. 2a shows the transmission of the movement by the wheel *A*<sup>1</sup> and the gear wheels *A*<sup>2</sup> *A*<sup>3</sup> to the bevel wheels *A*<sup>5</sup> *A*<sup>6</sup>, and from them, by means of the square telescopic shaft *A*<sup>7</sup>, to the principal wheel *A*<sup>4</sup> in the shutter box *L*<sup>5</sup>, the details of which are shown in figures 4 and 5.

In fig. 3 is shown, in end elevation, one of the winding-on drums *D* and its corresponding storing drum *D*<sup>1</sup>, the film *f* being shown passing around the rollers *F* *F* in front of the corresponding panel *J*. As shown at fig. 2, there are two of these panels *J*, both of which are covered with cloth or caoutchouc, and press the films alternately against the inner ends of the openings *R* *R*, by means of the block *B*<sup>1</sup> operated in one direction by the cams *O*, and drawn back in the opposite direction by the springs *a* *a*. Each of these springs, in any suitable manner, is fixed to the ends of one of the panels and also by pins *a*<sup>1</sup> *a*<sup>1</sup> (fig. 3) to the two rods *I* *I*, which are securely fixed across the case *L*<sup>4</sup>. The pins *a*<sup>1</sup> pass through slots formed in the spring *a*, so that the said spring can yield sufficiently under pressure of its cam *O* to enable the block *B*<sup>1</sup> to bear directly against the back of the panel *J*. When the pressure of the cam is withdrawn from the spring, the said spring, in assuming its normal condition, draws the panel *J* back from the film *f*. Fig. 3 also shows the section of the focussing lenses or "finders" *P*, of the ground glass *d*, and eyepieces *e*, as also the means for actuating through the lever



*V* its sleeve *u*, which acts upon the front part of the objective when focussing. It is to be observed that the ground glass *d* is in the same plane as the sensitive film when it is moved into position for the exposure, and the focal length of the lenses *P* and *L* being the same, the pictures represented upon the ground glass *d* will, in all particulars, practically be the same as those being taken by the objectives *L*. The spring or clip *G*<sup>3</sup> keeps the case *L*<sup>4</sup> firmly against the objective, and allows it (the case) to be readily withdrawn and replaced by another after the exposure of all the film wound upon the drums *D*.

Fig. 4 shows the mechanism for transmitting motion from the driving shaft *A* to the wheel *A*<sup>4</sup>. In this view, it must be observed that the section of the lenses is taken at a lower level than that showing the transmitting mechanism, in order the better to show the position of the shutters *G*, *G*<sup>1</sup>, *G*<sup>2</sup>, *G*<sup>3</sup>, and *H*<sup>1</sup>, *H*<sup>2</sup>, *H*<sup>3</sup>, *H*<sup>4</sup>, with their connecting rods *M*, *M*<sup>1</sup>, *M*<sup>2</sup>, *M*<sup>3</sup>.

Fig. 5 illustrates the system of shutters, and shows how the motion is transmitted from the wheel *A*<sup>4</sup> to runners *B*<sup>2</sup> *B*<sup>3</sup> *B*<sup>4</sup> *B*<sup>5</sup>, gear wheels *C*<sup>1</sup> *C*<sup>2</sup> *C*<sup>3</sup> *C*<sup>4</sup>, and mutilated gear wheels *J*<sup>1</sup> *J*<sup>2</sup> *J*<sup>3</sup> *J*<sup>4</sup> to double pinions and mutilated gear wheels *E*<sup>1</sup> and *D*<sup>2</sup>, *E*<sup>2</sup> and *D*<sup>3</sup>,



&c., to double shutters G H<sup>1</sup>, G<sup>1</sup> H<sup>2</sup>, G<sup>2</sup> H<sup>3</sup>, G<sup>3</sup> H<sup>4</sup>, which are provided with springs I<sup>1</sup> I<sup>2</sup> I<sup>3</sup> I<sup>4</sup> to bring them back to their first position as soon as the teeth of the wheels D<sup>2</sup> D<sup>3</sup> D<sup>4</sup> D<sup>5</sup> cease from operating them. This view shows also the rods M M<sup>1</sup> M<sup>2</sup> M<sup>3</sup> which transmit motion vertically from shutter to shutter for each vertical set of lenses.

In fig. 6 the objective being the same as in the receiver only the outside frames and bellows S thereof are shown. The back part of the finger is a section through the centre, and shows the film transparencies mounted on two ribbons of metal or other suitable material punched with holes H<sup>7</sup> fitting on the pins P<sup>1</sup> of the guide rollers G<sup>6</sup> G<sup>6</sup>, the said transparencies being stored on drums D D<sup>1</sup> which run loosely on shafts having square ends, and which shafts are supported in grooves M<sup>6</sup> M<sup>6</sup> provided in the framework C<sup>6</sup>. The weights and cords W<sup>1</sup> W<sup>2</sup> rolled on small pulleys P<sup>2</sup> P<sup>3</sup> rigidly secured to drums D and D<sup>1</sup> maintain the necessary tightness and steadiness of the films. At the back of the films is the reflector R<sup>1</sup> with sixteen or more incandescent lights supported by the rod E<sup>7</sup> sliding in socket F<sup>6</sup>; other lights may, however, be used in any number from one upwards. In front of the reflector are sixteen double condensers K<sup>5</sup> K<sup>5</sup> throwing the light through the sixteen pictures, and mounted on a frame L<sup>6</sup> grooved at I<sup>5</sup> so that they may slide in and out of the frame C<sup>6</sup> laterally when required. The lower of the guide rollers G<sup>6</sup> carries a pinion O<sup>5</sup>, gearing in wheel N<sup>5</sup>, supported by the frame C<sup>6</sup>, and provided with the crank handle Q<sup>5</sup> or any other device for transmitting power.

Fig. 7 shows the special disposition of the shutters, the same as in figure 5, but arranged for long exposures, the dark lines showing the full bearings, and the cogs of the mutilated gear wheels.

A suitable subject having been found, the photo-camera or receiver is brought in front and focussed. The receiver is composed of three parts:—1st. The objective; 2nd. The supply and motor box; 3rd. The stand.

The objective is a system of preferably 3, 4, 8, 9, 16 or more lenses of equal focus secured in a vertical brass plate or frame Z. Two light brass plates fixed in front of Z form a boxing in which the instantaneous shutters work automatically as explained hereafter. The drawings show as an example an objective of 16 lenses. On the back of the plate Z each lens is provided with a light tube Q sliding in and out of a corresponding set of tubes R slightly larger, and fixed on the front of the back plate Y; this arrangement of tubes, however, is only necessary where more than one lens is employed, the object being to prevent the light from one lens reaching the portion of film appropriated to another lens. The other four sides of the box S are made of the form of rubber bellows, so that no light can penetrate except through the lenses.

The back plate Y is provided with 16 preferably square openings, and securely fixed at T (figure 3) to a horizontal bed or board L<sup>2</sup> supported with two slides or grooves in which the lower corners U of the front brass plate Z can be moved backward and forward by means of a rack and pinion or lever arrangement to allow of accurate focussing. Figures 1 and 3 show such a lever arrangement in which the lever V presses on an eye-hole in the square rod u on the transverse bar v, which is connected with the corners or feet U of the front plate, and pushes or pulls it forward and backward as required. Under the bed plate L<sup>2</sup> is a knee joint K allowing inclination backward and forward upon a strong pivot rod L<sup>3</sup>, which is capable of revolving in a split clamping socket W fixed in the upper part of the stand, which is also provided with a small spirit level X. By this last mentioned arrangement the objective may be inclined backward and forward, revolved upon the pivot rod L<sup>3</sup>, and be brought to face any object around the operator, without interference with the inner action of the motor box, or case, or the focussing of the moving objects at varying distances, whilst at the same time the lateral sides of the pictures remain vertical.

The case L<sup>1</sup> is formed so as to overlap the objective at the top and sides, and this, with the spring catch G<sup>8</sup>, insures its fitting accurately against the back plate Y of the said objective. The front portion of the box is perforated with sixteen openings, L<sup>5</sup> L<sup>5</sup> corresponding to those formed in the plate Y, and a shutter H enables the operator to shut out the light either before the exposure or for the removal of the motor box L<sup>4</sup>.

The films f may be wound upon the two lower drums mounted on the spindle E upon which they can turn freely when necessary, tension on the films being obtained by means of springs e fixed to the spindle E, and acting upon an interiorly

toothed wheel fixed to the end of the drum D as shown in figure 3. The films pass round guide rollers F<sup>1</sup> F<sup>1</sup> and F F (see figure 3) in such manner as to present a flat surface facing the lenses for exposure, and are lastly wound upon the upper rollers D<sup>1</sup> mounted upon the spindle E<sup>1</sup>, and provided with gear wheel C upon their outer faces or discs. These wheels C C gear alternately with two half-toothed or mutilated wheels B B (see figure 3) fixed on the driving shaft A, which extends across and is supported in the sides of the motor box L<sup>1</sup>, and is squared at one end to receive a crank which may either be turned by hand or by any other suitable motive power.

The toothed portion of each of the wheels B B is continued far enough round its periphery to unwind at each revolution of the shaft A, a length of film equal at least to the full height of the openings L<sup>5</sup> which are opposite the objectives L. Each of the two cams O O (figures 2 and 3) presses during a part of its revolution against one of the two blocks B<sup>1</sup> B<sup>1</sup> fixed to two springs a a screwed to two light spindles I I which extend across the motor box. These springs are also fixed at their extremities to the two vertical panels J J, which, together, have a somewhat larger surface than that of the exposed portions of the film, so as to hold said films tightly against the openings L<sup>5</sup> formed in the motor box. During a half of the revolution of the cams O O one of the panels is drawn back from the film f by its spring a, while the drum D corresponding thereto operated by its half-toothed or mutilated wheel, rolls on to it the surface which has last been exposed, and brings a fresh sensitized surface into position to be exposed, after that then being exposed is wound upon the other of the Drums D. The movement is communicated to the shutters by the wheels A<sup>5</sup> A<sup>6</sup> (figures 2, 2a, and 4) and the wheels A<sup>1</sup> A<sup>2</sup> A<sup>3</sup>. A square spindle fixed to the wheel A<sup>6</sup> revolves the socket A<sup>7</sup> into which enters the square spindle of the wheel A<sup>1</sup> (figures 2a and 4) which operates the shutters, which arrangement permits of the adjustment of the focus being effected without interrupting the working of the apparatus. The wheel A<sup>4</sup> gears with the wheel B<sup>2</sup>, and through it with the wheels C<sup>1</sup>, B<sup>3</sup>, C<sup>2</sup> B<sup>4</sup>, C<sup>3</sup>, B<sup>5</sup>, and C<sup>4</sup>, which are all alike. The wheels C<sup>1</sup>, C<sup>2</sup>, C<sup>3</sup>, and C<sup>4</sup> are fixed to wheels J<sup>1</sup>, J<sup>2</sup>, J<sup>3</sup>, J<sup>4</sup>, which are of larger diameter and toothed only on one quarter of their periphery, each operating a pair of pinions E<sup>1</sup> E<sup>2</sup> E<sup>3</sup> E<sup>4</sup> provided with the same number of teeth as the quarter-toothed wheels. These pinions are fixed to another system of quarter-toothed wheels of a larger diameter, the teeth of which turn the double pinions F<sup>2</sup> F<sup>3</sup> F<sup>4</sup> F<sup>5</sup> fixed to the shutters G and H<sup>1</sup>, G<sup>1</sup> and H<sup>2</sup> &c., figure 5.

Four rods M M<sup>1</sup> M<sup>2</sup> M<sup>3</sup> vertically connect the four systems of double shutters, and each of the 16 pinions F<sup>2</sup> O<sup>1</sup> T<sup>1</sup>, &c., is provided with a spiral spring I<sup>1</sup> I<sup>2</sup>, &c., which returns the shutter to its normal position against the stop K<sup>3</sup> Q<sup>1</sup>, &c., as soon as it has passed the toothed part of its corresponding quarter-toothed wheel. In this manner during the first quarter of the revolution of the wheel A<sup>1</sup> the toothed quarter of the wheel J<sup>1</sup> communicates an entire revolution to the pinion E<sup>1</sup>, and during the first quarter of this revolution it will operate the pinions of the shutters G and H<sup>1</sup> in such a manner that the shutter G will open the aperture L, while H<sup>1</sup> will take its place and close it. As, however, the quarter of the wheel which gears with the pinion of the shutter H<sup>1</sup> has one or more teeth less than the one operating the shutter G, the shutter H<sup>1</sup> will be liberated so much sooner, and drawn down by the spring I<sup>1</sup>, thus producing the exposure, which is terminated by the subsequent fall of the shutter G.

The second quarter of the revolution of the pinion E<sup>1</sup> will produce the same result for the shutters P<sup>5</sup> and R<sup>5</sup> by means of the connecting rod M. The third and fourth quarters operate the two pairs of shutters situated underneath in the same manner, thus completing one of the vertical series. The second quarter of the revolution of the wheel A<sup>1</sup> will operate in the same manner upon the gearing of the next vertical system through the quarter-toothed wheel J<sup>2</sup>. The third quarter operates the quarter-toothed wheel J<sup>3</sup>, and the fourth J<sup>4</sup>. In this manner sixteen exposures are obtained for each revolution of the wheel A<sup>1</sup>. As during one-half of the revolution of the wheel A<sup>1</sup> the exposed film of one drum has been replaced by the unrolling of a fresh surface, the first exposed part being rolled up on its corresponding higher drum, and as it is the same with the other pair of drums D D<sup>1</sup>, during the other half revolution there will be no interruption in the exposure.

The speed of one revolution of the wheel A<sup>1</sup> per second will give 960 pictures per minute, and in this manner it will be seen that by increasing the rate of motion of the wheel A<sup>1</sup> it is easy



to produce several thousands in the same time, and with drums of large diameter and a few reserve boxes at hand to be fixed behind the objective it will be possible with a suitable light and by means of the projector to reproduce the aspect of animated scenes such as meetings, processions, races, and the like.

The before-mentioned stand is provided with a strong tripod, and may be also provided with weights and chains or the like to increase its stability.

The objective of the projector (figure 6) is of similar construction to that of the receiver. The shutters are single, and remain open until the next shutter is opened. This result is obtained by constructing the before-described quarter-toothed wheels as half-toothed wheels as shown in the diagram, fig. 7. The motor box of the receiver is in the projector replaced by the frame C<sup>6</sup> and reflector R<sup>1</sup>, provided with as many incandescent electric lamps as there are objectives, these lamps being supported on the rod, E<sup>7</sup>, which is capable of sliding in the socket F<sup>6</sup>. The incandescent electric lamps may be replaced when desirable by lime lights made incandescent by means of common gas, hydrogen, or water gas, in combination with a blow of air or oxygen; or by magnesium lights or any other means of producing a powerful light or a series of powerful and compact lights. Between the reflector and the transparent film a frame L<sup>6</sup>, containing the condensers K<sup>3</sup>, can be introduced or withdrawn at will by means of slides and grooves I<sup>6</sup>.

The transparencies are carried by a pair of ribbons of metal or other suitable material provided with holes H<sup>7</sup> in which engage the teeth P<sup>1</sup> of the driving and guide drums G<sup>6</sup>, so that after the ends of the said ribbons are connected to the drum D, the transparencies are brought into position alternately by the wheels N<sup>5</sup>, O<sup>5</sup>, and the crank Q<sup>5</sup>, one set of the drums, D D<sup>1</sup>, feeding the transparencies at the desired speed, and the other set receiving them after exposure. When the transparencies are of glass the drums G<sup>6</sup>, D, and D<sup>1</sup>, are preferably formed with facets so as to accommodate them without risk of breakage. The necessary tension is obtained by means of weights W<sup>1</sup> W<sup>2</sup> suspended on cords wound round the pulleys P<sup>2</sup> P<sup>3</sup>, fixed to the ends of the drums. From the driving wheel N<sup>5</sup>, motion is communicated to the wheel A<sup>4</sup> by means of the wheels A<sup>3</sup> A<sup>6</sup>.

The sensitive film for the negatives may be an endless sheet of insoluble gelatine coated with bromide emulsion or any convenient ready-made quick-acting paper, such as Eastman's paper film. The exposure will be given as before described, and development carried out as usual, care being taken to mark the negatives in their regular order before cutting them when such cutting is required.

The sensitive film for the transparencies or positives must be on a transparent material such as gelatine, mica, horn, glass, &c. Once well developed and toned, the transparencies may pass through the hands of artists who will tint them in transparent colours, dyes, or lacquers, as the subject may require; and they will be ready for mounting and adjusting between the metallic ribbons which will bind them together.

When the "animated" pictures to be taken are of long duration the receiver has to be provided with one or more supply and motor boxes ready to be fixed to the back of the objective as soon as the films on the supply drums of the first box are exhausted, the boxes containing the latter being taken to the dark room or tent to have new drums inserted by an assistant, whilst the operator attends to the receiver.

When the receiver is provided with only one lens, as it sometimes may be, it is so constructed that the sensitive film is intermittently operated at the rear of the said lens, which is provided with a properly-timed intermittently operated shutter; and correspondingly in the deliverer when only one lens is provided, the band or ribbon of transparencies is automatically so operated as to bring the pictures intermittently and in the proper order of succession opposite the said lens.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. The method herein described of producing "animated" pictures, and consisting (a) in the successive production by means of a photographic camera of a number of images of the same object or objects in motion, and (b) in reproducing the same in the order of taking by means of a "projector" or "deliverer," thereby producing on the eye of the spectator a similar impression to that which would have been produced by the

original object or objects in motion, substantially as described.

2. In an apparatus for producing "animated" pictures the continuous alternate operation of the film and its corresponding shutter or series of shutters, substantially as described.

3. As a means of producing "animated" pictures, a photographic camera or receiver, provided with a series of lenses in combination with a series of shutters operating successively and in regular motion, substantially as described.

4. As a means of producing "animated" pictures, a photographic receiver provided with one or more lenses and one or more shutters, in combination with one or more intermittently operated film drums, substantially as described.

5. In an apparatus for producing "animated" pictures, the combination with an intermittently moving film *f* of an intermittently operated panel such as *J*, substantially as and for the purpose described.

6. In an apparatus for producing "animated" pictures, and having more than one lens, the combination with said lenses of tubes such as *R* to prevent the light from one lens reaching the portion of film appropriated to another lens, substantially as described and illustrated.

7. The combination with a receiver for producing "animated" pictures, of one or more focussing lenses, such as *P*, which, while separate from the photographing lenses, move therewith, substantially as and for the purpose described and illustrated in the accompanying drawings.

8. The general arrangement and combination of parts constituting the complete receiver for producing "animated" pictures, substantially as herein described and illustrated in the accompanying drawings.

9. In an apparatus for producing "animated" pictures the combination in the deliverer with a lens or series of lenses, and shutter or shutters, and condenser or condensers, to correspond, of an intermittently moving band or series of transparencies substantially as described.

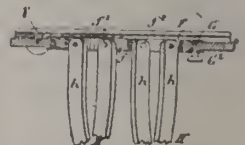
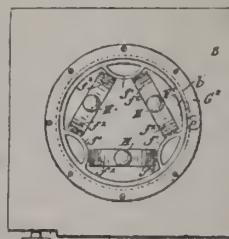
10. The general arrangement and combination of parts constituting the complete "deliverer" for projecting "animated" pictures, substantially in the manner and for the purpose herein described and illustrated in the accompanying drawings.

11. The complete apparatus for producing and delivering "animated" pictures comprising a receiver and deliverer, each constructed and operating substantially in the manner and for the purpose described and illustrated in the accompanying drawings.

#### Patented in America.

393,696. WILLARD H. FULLER, Passaic, N. J., assignor to the Scovill Manufacturing Company, New York, N.Y., for "Photographic Camera."—Filed July 9th, 1887. Serial No. 243,814. (No model).

*Claim.*—In a photographic camera, the combination, with a back, a bellows, and front piece, said bellows and front piece adapted to be inclosed within the back piece by a bodily movement toward said back piece of a leaf or base piece hinged to



said back piece, so as to fold up against the back piece and close one side of the same and to be extended at an angle to it, said base-piece having an opening through which may extend a lens-tube on the front-piece when the base-piece is folded, a ring having a tongue movable in ring-plates secured to the base-piece and having on its surface a series of bows provided with aligned lugs, and a carriage on said base-piece having a lengthwise adjustment and having a rectangular opening, substantially as specified.



## Proceedings of Societies.

### DEVON AND CORNWALL CAMERA CLUB.

A MEETING of the members of the Devon and Cornwall Camera Club was held at the Freemasons' Hall, Cornwall Street, Plymouth, on Wednesday afternoon, Mr. S. PODE in the chair.

Miss Napier was elected a vice-president of the Club, and Messrs. J. B. Foster, J. Clarke, R. C. Marshall, and J. T. Rogers were elected members.

Samples of sensitised paper, presented by Mr. J. B. Edwards, and of Wolff's adhesive mounts, presented by Mr. Senior, were distributed to members present for trial.

Major BARRINGTON BAKER exhibited some prints on these mounts, and spoke highly in their favour, strongly recommending them to all present.

Major BARRINGTON BAKER then proceeded to explain his system of enlarging without a condenser. He stated that the ordinary apparatus for enlarging from a half-plate negative was very expensive, the price varying from £10 to £14. This was chiefly on account of the great cost of the condenser. His, as shown, consisted of a wooden packing case made fairly light-tight, an old tin pail with a hole in the bottom as a chimney, a Postlethwaite sixty candle power duplex lamp with a large opal globe, and a camera in front with lens, the whole apparatus, without camera and lens, costing only a few shillings. A table showing distance required from negative to lens, or board, times of exposure for different diameters of enlargement, &c., was used as a means of focussing, a scale being marked on the base board of the camera. The afternoon being exceptionally light for the time of year, a difficulty was experienced in making the room sufficiently dark, and it was pointed out that the picture would probably be flat, and without contrast in consequence. A negative was inserted, and the lamp set for an enlargement of six diameters, or from a half length cabinet portrait, to a head and shoulders on a sheet of paper measuring 15 by 12 inches. A sheet of Ilford rapid rough bromide paper was then attached to the board by drawing pins, and an exposure given of two minutes and twenty seconds, the lens being a C.D.V. of 6 inch focus, working at F-4. The paper was removed and developed with ferrous-oxalate in the usual way, and the picture came up rapidly but without any white, the high-lights being degraded by the diffused white light in the room, as had been foretold. The lecturer pointed out that tin dishes, coated with black varnish, were most suitable for large work of this kind, being cheap, light, and not easily damaged. He spoke highly of the Ilford paper; he had tried four other varieties, but liked this by far the best, and had found it pleasant and easy to work. Some examples of enlargements, with prints from the same negatives, were handed round for inspection. Some had been made with the C.D.V. lens to as much as nine diameters, and one was made with a Ross R.S. lens of 10 inches focus; this latter—a mountain view in Jamaica—was much admired. Mr. Roy then exhibited a 12 by 10 camera of his own construction, giving every focus up to 24 inches, single swing back, side swing to front, rising and cross fronts, &c. There were no screws or other projections, and the camera was very light and firm for its size. The case was quite a novelty, being somewhat similar to a commercial traveller's sample case. It would contain the camera by itself, or, expanding, hold camera, focussing cloth, and six double backs. Major Barrington Baker also showed a 10 by 8 camera built for hard work in the tropics. This one had a quantity of angled brass in its construction. It had no loose parts; the tripod head revolving, was contained in the baseboard; double swing-back and fronts; draws out to front and clamps at any point, fine focus by rack at back without disturbing the swings; lens easily changed by a simple plan of lens-holder; a lens of any focus from 6 to 26 inches could be used; plumb level at the side. The dark slide was put into its place and locked by a movement of little more than an inch. The owners of both cameras were highly complimented upon the ingenuity shown in the design, as well as for the workmanship, this latter being of very high character.

Mr. PODE showed an album of most interesting specimens of the earlier days of photography, executed by Fox-Talbot, the inventor of Talbotype. He also showed an enlarged negative taken in London some twenty years ago on waxed paper.

The next meeting will be on January 9th, when there will be a conversation and general discussion on apparatus and things in general.

### BATH PHOTOGRAPHIC SOCIETY.

A GENERAL meeting was held on the 19th inst. at the Royal Literary and Scientific Institution, Terrace Walks, Mr. AUSTIN J. KING in the chair.

Mr. Pumphrey was unanimously elected president for 1889.

The new PRESIDENT then took the chair, and thanked them for the honour done him.

On the motion of the Chairman, seconded by Mr. Friese Greene, Mr. Austin J. King was unanimously elected Vice-President.

The PRESIDENT then gave an interesting address on the Daguerreotype process. The earlier processes of photography, he said, were, at the present time, hardly known. If we go back to the earliest time when a photographic effect was produced, it would be in the days of Wedgwood and Herschel, when it was found that certain silver salts became reduced by the action of light, when in connection with organic bodies, into a form of oxide. Wedgwood obtained photographs by coating white leather with a solution of silver. He (the speaker) was not aware that paper entered into his experiments. That was the real starting point, and from that day until now, with one exception—namely, that of natural colours—processes had been introduced and modified that something nearly approaching perfection was reached. In 1814, at Chalon sur Saône, Niepce, Niepce was engaged in experiments with silver iodide, which he carried on for a considerable time with very little result. The first images produced in the camera were by Daguerre. He was not a chemist, neither was he an optician; he was a scene painter. How strange it should be that he should have been led to examine the action of light on silver. This was about 1829. Finding Niepce working in the same direction, and to prevent clashing with each other, a partnership was entered into between them to carry out the invention of producing images by light. About ten years afterwards, in 1839, the process of Daguerreotype was published to the world, the French Government granting to Daguerre 6,000 francs, and 4,000 francs to Niepce. Owing to the state of the patent laws in this country, Beard patented the process in England and held it for several years, so that all who practised it had to take out a license.

The President described the method of producing a suitably clean surface of pure silver on a copper base by means of tripoli and polishing with rouge buff, and iodizing the silver surface with volatilized iodine to form a thin film of silver iodide. This film was comparatively insensitive; for pictures of the Parthenon, in Paris, he remembered seeing in 1839 or 1840 required, in a good light, a fifteen minutes' exposure; thus portraits were difficult to do. Claudet, in England, introduced bromine, which quickened the process and made portraiture practicable and prevalent. Now we have the means of producing as many duplicates as we please. Then Daguerreotype was unique; they were *per se*, for reproductions in the camera were not worth looking at. It being quite competent to use daylight in preparing the plates up to the last second or so, when sensitiveness was obtained, and there being no visible change after exposure, the most extraordinary thing is, how Daguerre came to find out there was a latent image developable. He, however, did find out that the vapour of mercury took hold of the portions of the plate where the light had acted, but did not touch the other parts. The picture was thus formed of mercury in minute globules, and in that condition could be rubbed away easily. Fixing in hypo and toning in a solution of gold caused a union of the metals; even then the delicate surface could be easily destroyed. Several examples produced about the year 1840 were shown, some of which were in very good condition.

Mr. B. WILLIAMS, in proposing a vote of thanks to the President for his address, referred to the simplicity of dry plate photography compared to the earlier processes.

Mr. P. BRAHAM, who seconded the resolution, contrasted the cleanliness necessary to ensure success between preparing every plate before use, with instantaneous photography as exemplified in detective camera work. He also thought England had done more than any other country to advance the art.

The HON. SECRETARY briefly explained the arrangements which were in progress to provide dark room accommodation in the basement of the Institution suitable for day and gas-light work, and an enlarging room, &c. He also spoke of the usefulness of sub-committees to deal with these matters, as well as outdoor meetings and the forthcoming exhibition of pictures and apparatus.



## Talk in the Studio.

MR. W. J. DIBDIN ON STANDARDS OF LIGHT.—In a paper read before the Society of Arts the author dealt comprehensively with the subject of standards of light, but principally in reference to a standard for estimating the value of coal gas, and he set forth the necessity for the legalisation of a better standard than the unsatisfactory candle standard. He concluded his remarks by saying:—"It cannot be imagined, however, that the general public of the country are aware of the present defective condition of the question. In all other matters affecting the commercial transactions of daily life, the most stringent regulations are in force to maintain almost mathematical accuracy in the various weights and measures used. In the matter of light alone the utmost laxity prevails, and when it is considered that such vast interests are at stake, it seems almost inconceivable that the legalisation of an accurate standard of light, such as can now be obtained, should be delayed for a moment longer than that required to take the necessary steps."

THE INDISPENSABLE HAND-BOOK TO THE OPTICAL LANTERN.—This work, which is edited by Messrs. Welford and Sturmev, is just the sort of book which every lanternist should always keep ready to hand. Not only does it contain descriptions and prices of all the leading lanterns and appliances in the British market, but it gives due prominence to the latest methods of working, and specially emphasizes the important bearing of recent improvements in the use of compressed gases. And the excellent feature is the comprehensive directory of the various series of lantern slides in the market. The price of the book is half-a-crown, and it consists of 370 large octavo pages.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—A meeting was held on December 18, at Myddleton Hall, Islington, Mr. J. Traill Taylor, President, in the chair. In opening the discussion on "The Production of Transparencies by Means of the Camera," Mr. Edgar Clifton gave a description of a simple and efficient arrangement he had used for that purpose. It consisted of a board about four feet long having guides between which an ordinary camera would slide from end to end, and bearing at one end a series of frames nesting in each other, capable of taking negatives from 12 by 10 downwards. The camera was so arranged that the lens was placed centrally with the negative, and the negative holder was pivoted between two uprights, so that it could be swung to correct converging perpendiculars if necessary; a couple of laths were laid on the top of the whole arrangement, and a focussing cloth thrown over them to exclude extraneous light. The next meeting will be held on Tuesday, Jan. 1, and will be a general technical meeting.

COMPRESSED PULP-SLABS FOR SQUEEGEEING BROMIDE AND OTHER PRINTS.—From Mr. W. Tylar, of Birmingham, we have received a papier-mache board, intended as a basis upon which to squeegee prints for flat drying. One surface is polished, and the other dull; the polished surface being like that of an ordinary papier-mache tea tray. Boards of this sort, if cheap, should be useful in many ways.

ROYAL INSTITUTION.—The following are among the lecture arrangements for the period before Easter:—Prof. Dewar, 6 lectures (adapted to a juvenile auditory) on Clouds and Cloudland; Prof. G. J. Romanes, 12 lectures constituting the second part of a course on Before and After Darwin; Prof. J. W. Judd, 4 lectures on The Metamorphoses of Minerals; Prof. J. H. Middleton, 4 lectures on Houses and their Decoration from the Classical to the Medieval Period; 8 lectures by the Right Hon. Lord Rayleigh on Experimental Optics (Polarisation, the Wave Theory). The Friday evening meetings will begin on Jan. 25th, when a discourse will be given by Prof. G. H. Darwin. Succeding discourses will probably be given by Prof. W. C. McIntosh, Sir Wm. Thomson, Prof. A. W. Rucker, Mr. Harold Crichton Browne, Prof. Oliver Lodge, Prof. Archibald Geikie, Rev. Alfred Ainger, Right Hon. Lord Rayleigh, and other gentlemen.

SAFETY RETORT FOR PREPARING GASES. By N. v. Klobukoff, (*Zeit. anal. Chem.*, 27, 467—469).—The retort consists of three parts: a cast-iron cylindrical pot, with a gutter about 2 cm. deep round its edge; a cast-iron convex cover, with a vertical rim fitting into the gutter; a wrought-iron tube screwed into the cover. The gutter is filled with a pulp consisting of 100 parts of coarse sand and 50 or 60 parts of plaster of Paris. This mixture when dry is but little penetrable by gases, even under moderate pressure (30 cm. of water), but yields easily in the event of any high pressure in the retort, allowing the cover to lift, and thus preventing explosion.—*Journ. Chem. Soc.*

## To Correspondents.

\* \* \* Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, FURNIVAL STREET, LONDON, E.C."

W. L. MITCHELL.—An excellent plan is to take a lump of moderately soft putty and to dab it over the bright parts with a sort of rolling motion, which is easy to learn after a few trials.

J. ROBERTSON.—1. If you proceed as recommended on p. 109 of the YEAR-BOOK, you will probably have no difficulty. See also pages 195, 196, and 53. 2. It will make the plate much more rapid, but with a tendency to fog. 3. We prefer the latter, but the solution must be neutral, or only very faintly alkaline.

ARGENT.—1. Winter is an excellent time for photographic work in the district referred to, and it may influence your choice to know that there are many English families in the neighbourhood as winter residents.

TRIAL.—Old *Times* newspaper stained with a saturated aqueous solution of picric acid answers very well, but as the picric acid is rather volatile, new colour will have to be put on occasionally. Two thicknesses over a large window are sufficient. This sort of blind will not do for working gelatino-bromide plates. 2. If the tissue is kept dry and protected against strongly actinic light, it will probably keep well for even a longer period; but unrecognized influences sometimes step in and cause it to become insoluble.

J. P.—It contains a trace of hyposulphite.

MASTER.—A question of law is involved, and the photographic aspects of the case have probably no bearing on the matter. You had better consult a solicitor.

T. FIELDER.—Fume your paper with ammonia—that is, shut it up in a close box along with a saucer containing a tuft of wool saturated with strong ammonia solution.

R. HOWARD.—The result is very unsatisfactory, and it would have been very much better if you had got the reduction made by the photo-zincographic process. A London zinc etcher would only charge 5s. for making the block, and it may be worth your while to discard the woodcut and have a photo. block made. In order to insure the absence of distortion, rule an exact rectangle round the original, and refuse to accept the reproduction if this rectangle is distorted. You can easily cut it off the block as soon as you have verified its accuracy.

CARBON.—1. We cannot tell unless we see a print. 2. Add enough ammonia to make the solution decidedly alkaline. The excess will evaporate in drying, and will do no harm. 3. A collodion substratum is by far the best, but its use involves a little extra trouble.

MEERLIN.—1. The grain known as the Pretsch grain can generally be obtained by adding to the mixture one-third as much chloride of calcium as there is gelatine present, but you must dry at rather a high temperature. 2. The sample sent is decidedly acid with sulphurous acid. That sold as Nelson's amber gelatine answers very well, and we have obtained good results with the Nelson's opaque gelatine, which can be obtained in packets from any grocery.

INQUIRER.—It was issued by the Society of Arts, John Street, Adelphi, and, if not out of print, can be obtained from the office, John Street, Adelphi, London.

LEX.—There is a bookbinders' material shop on the West side of Bride Street where we think it can be obtained.

W. W.—Equal parts of methylated spirit in water.

AMATEUR (Hoxton).—Some chemically active dust has settled on the paper while drying.

AMATEUR (Stockport).—We are much obliged to you for the information, and will be glad to receive further particulars.

## The Photographic News.

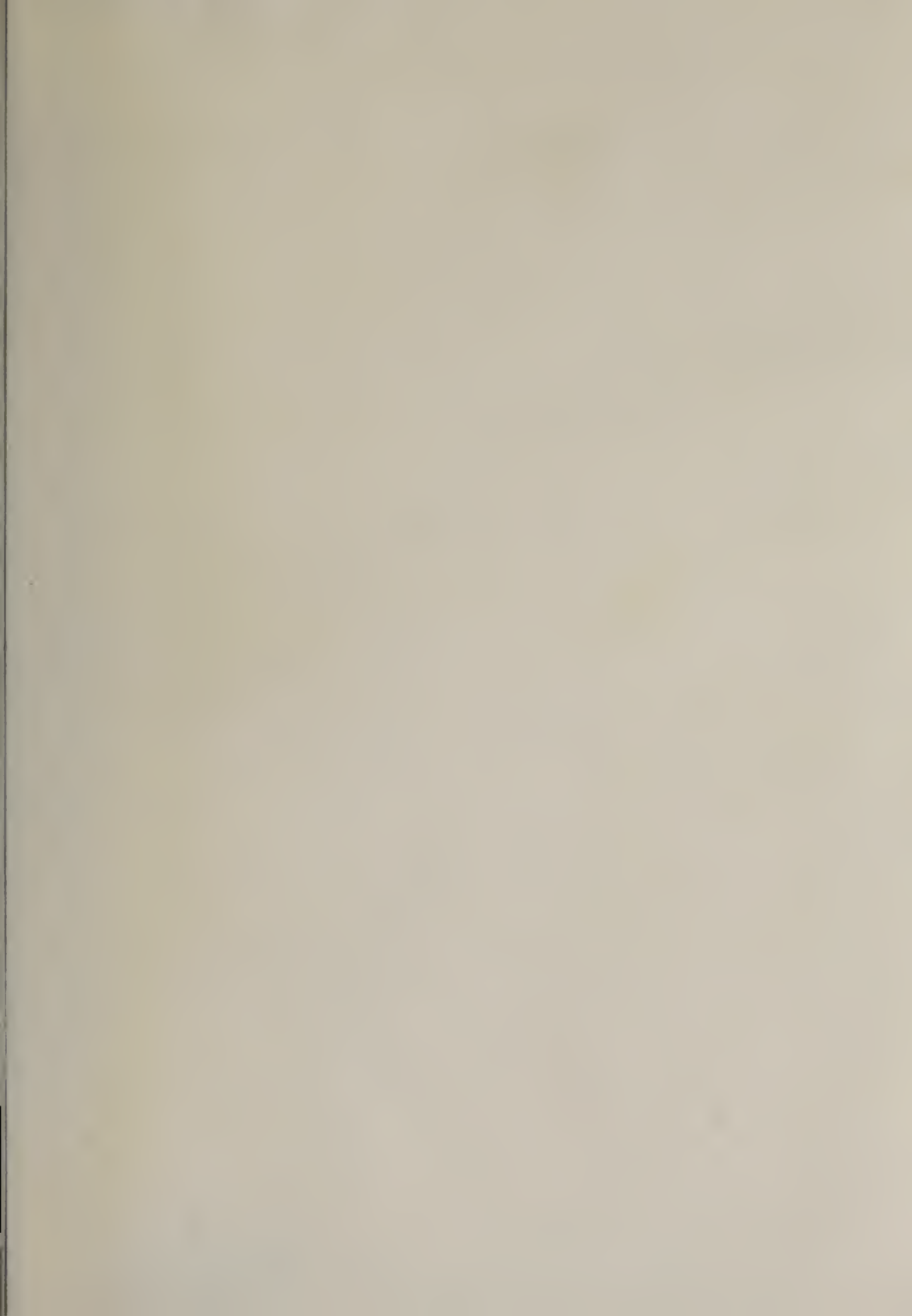
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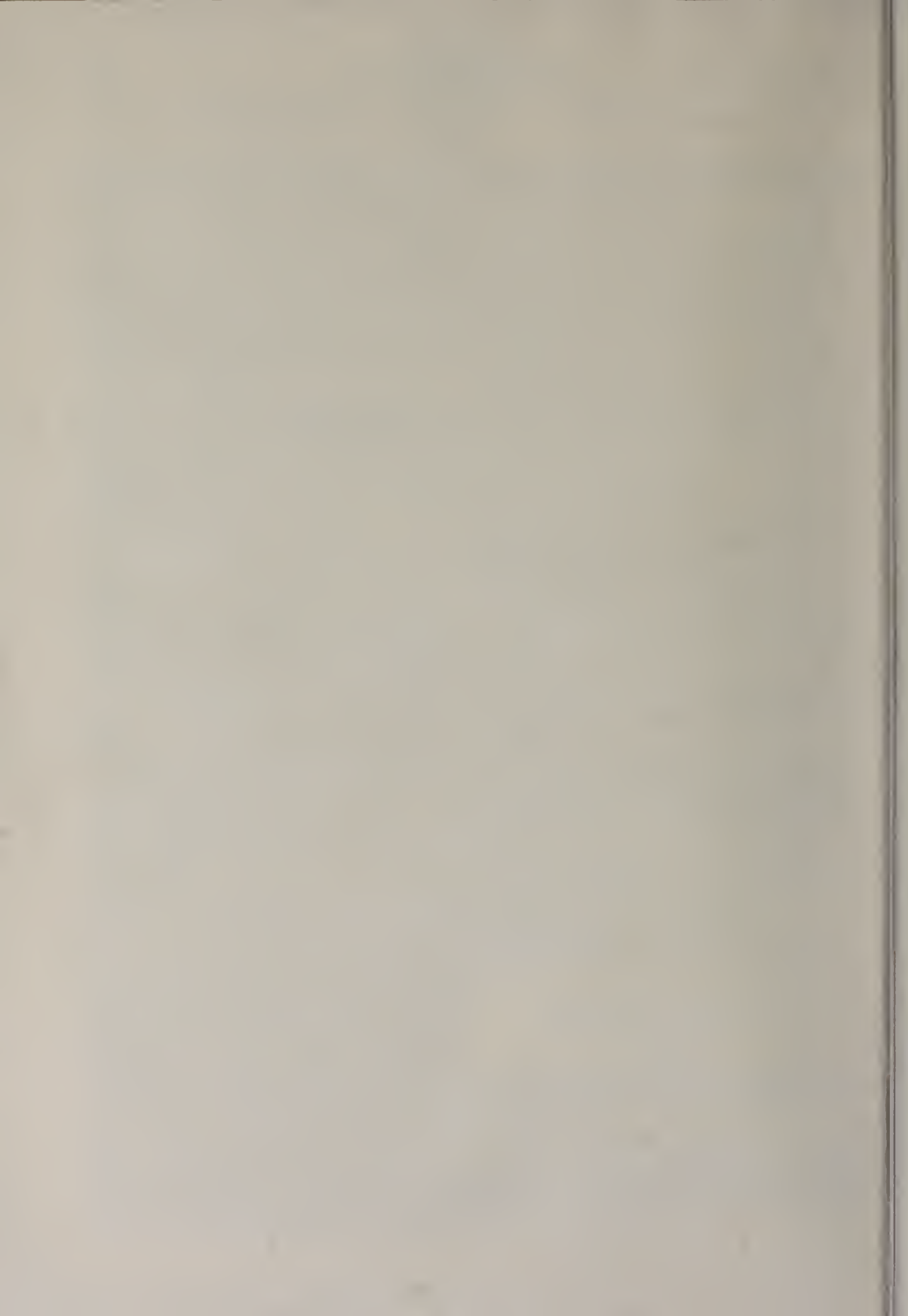
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